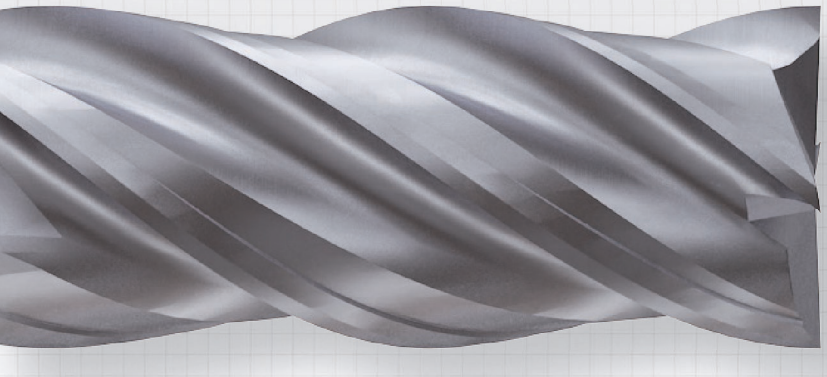

YG-1 CO., LTD.

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Note The information is provided for reference only. Tool specifications are subject to change without prior notice.
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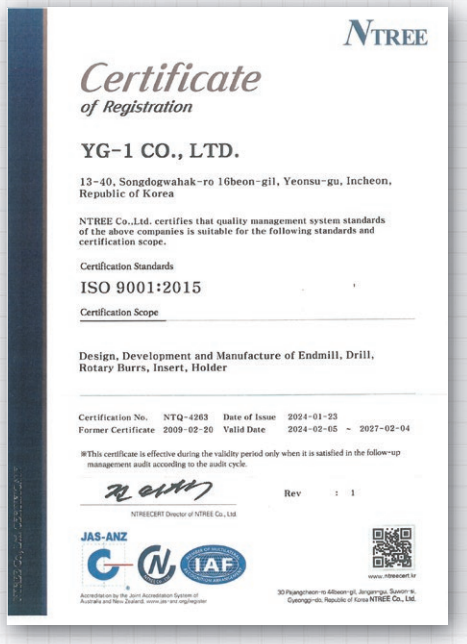
CUTTING TOOLS ON HAND



NTREE

Certificate
of Registration

YG-1 CO., LTD.

13-40, Songdogwahak-ro 16beon-gil, Yeonsu-gu, Incheon, Republic of Korea

NTREE Co.,Ltd. certifies that quality management system standards of the above companies is suitable for the following standards and certification scope.

Certification Standards

ISO 9001:2015

Certification Scope

Design, Development and Manufacture of Endmill, Drill, Rotary Burrs, Insert, Holder

Certification No. NTQ-4263 Date of Issue 2024-01-23
Former Certificate 2009-02-20 Valid Date 2024-02-05 ~ 2027-02-04

※This certificate is effective during the validity period only when it is satisfied in the follow-up management audit according to the audit cycle.

Rev : 1

NTREECERT Director of NTREE Co., Ltd

JAS-ANZ

www.ntreecert.kr

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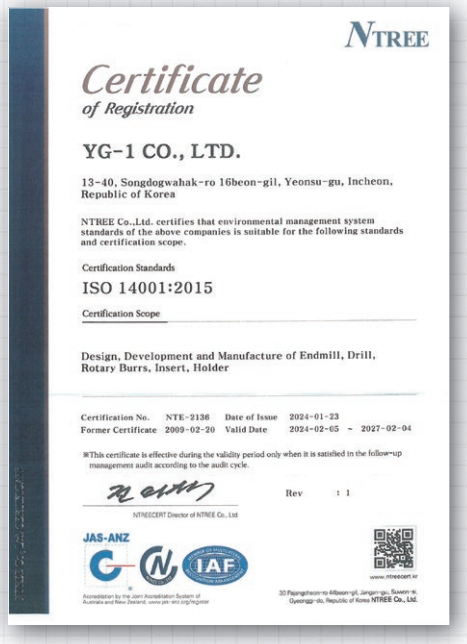

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Certificate
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YG-1 CO., LTD.

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NTREE Co.,Ltd. certifies that environmental management system standards of the above companies is suitable for the following standards and certification scope.

Certification Standards

ISO 14001:2015

Certification Scope

Design, Development and Manufacture of Endmill, Drill, Rotary Burrs, Insert, Holder

Certification No. NTE-2136 Date of Issue 2024-01-23
Former Certificate 2009-02-20 Valid Date 2024-02-05 ~ 2027-02-04

※This certificate is effective during the validity period only when it is satisfied in the follow-up management audit according to the audit cycle.

Rev : 1

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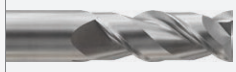
TOOL SELECTION for MILLING

SOLID CARBIDE END MILLS

P M K N S H : Excellent

P M K N S H : Good

Work Material						Item	OD Size Range	Number of items	Flute	Features	Catalog Page
P	M	K	N	S	H						
P					H	**X1-EH**	Ø0.1mm - Ø20.0mm	819 Item	2 Flute	• Highly Accurate **Fine-Finishing** End Mill for **High-Hardened Steel (HRc50-70)** • **Tight Tolerance** / Long Tool Life(Extended Tool Life) / Wide Range Portfolio	C81-C138
P					H	**X5070**	Ø0.1mm - Ø25.0mm	573 Item	2 - 8 Flute	• Finishing and Semi-Fisihing End Mill for **High-Hardened Steel (HRc45-60)** • Dry & High-Speed Cutting	C139 - C198
P	M	K			H	**4G MILL**	Ø0.1mm - Ø25.0mm	2,445 Item	2 - 6 Flute	• For **Pre-Hardened Steels (HRc40-55)** • Full Range Offering / Dry & Wet Cutting	C199 - C296
P	M	K	N			**X-SPEED ROUGHER** (4G MILL)	Ø6.0mm - Ø20.0mm	36 Item	4 - 5 Flute	• **4G Mill Roughing Version** for Pre-Hardened Steels Up To HRc40	C297 - C368
P	M	K			H	**X-POWER PRO**	Ø0.4mm - Ø25.0mm	285 Item	2 - 8 Flute	• For **Pre-Hardened Steels Up To HRc30-50** • Selected Portfolio (Tailored Selection) / Market-Proven Performance	C369 - C416
P	M	K		S		**V7 PLUS**	Ø3.0mm - Ø25.0mm	488 Item	4 - 6 Flute	• **Heavy Cutting** For Steels, Cast Iron And Stainless Steels, **Optimized for Up To HRc35**	C461 - C476
P	M	K		S		**V7 PLUS** with Chip Splitter	Ø6.0mm - Ø25.0mm	32 Item	6 Flute	• V7 PLUS with Chip Splitter for **Enhanced Chip Removal Performance**	C477 - C486
P	M	K	N	S	H	**K-2**	Ø0.4mm - Ø25.0mm	807 Item	2 - 6 Flute	• **For General-Purpose** Machining End Mill • Competitive Price	C555 - C630
P	M	K	N	S	H	**K-2 Die & Mold**	Ø0.4mm - Ø20.0mm	235 Item	2 - 4 Flute	• **For Die & Mold Industry End Mill Up To HRc40** • 2 Flute Ball, 2 & 4 Flute Corner Radius / Competitive Price	C562 - C576
P	M	K		S		**TitaNox POWER**	Ø6.0mm - Ø25.0mm	198 Item	4 - 5 Flute	• High Speed Machining for Titanium, Nickel Based Alloys And Stainless Steel	C417 - C421
P	M	K		S		**TitaNox POWER** HPC	Ø6.0mm - Ø25.0mm	92 Item	5 Flute	• **Heavy Cutting** for Titanium, Nickel Based Alloys and Stainless Steel	C422 - C438
P		K	N			 **ALU-POWER**	Ø2.0mm - Ø25.0mm	149 Item	1 - 3 Flute	• For Aluminum Alloys and Other Non-Ferrous Materials	C503 - C522
			N			**ALU-POWER** HPC	Ø3.0mm - Ø25.0mm	271 Item	3 Flute	• High-Performance Machining in Difficult Aluminums	C487 - C497
			N			**ALU-POWER** HPC with Chip Breaker	Ø6.0mm - Ø20.0mm	48 Item	3 Flute	• Alu-Power HPC With Chip Breaker for **Enhanced Chip Removal Performance**	C498 - C502
P	M			S	H	**JET-POWER**	Ø1.0mm - Ø25.0mm	202 Item	2 - 8 Flute	• For Exotic Materials Like Stainless Steels, Nickel Alloys And Titanium	C439 - C460

TOOL SELECTION for HOLEMAKING

P M K N S H : Excellent

P M K N S H : Good

SOLID CARBIDE DRILLS

Work Material P	M	K	N	S	H	Item	OD Size Range	Number of items	Drilling Depth	Coolant	Features	Catalog Page
P		K				**DREAM DRILLS - HIGH FEED**	Ø5.0mm - Ø20.0mm	174 Item	3xD 5xD	- With Coolant	• 3-Flute Carbide Drill for **High Feed Machining** • 1.5 to 2 Times Faster Feeding Speed than 2-Flute Drill	**A117 - A124**
P	M	K			H	**DREAM DRILLS - PRO**	Ø1.0mm - Ø20.0mm	487 Item	3xD 5xD	- With Coolant - Without Coolant	• **High Cutting Speed Drilling** for Carbon Steels, Alloy Steels, Pre-Hardened Steels (HRc30-50), Cast Iron • Productivity / Extended Tool Life with Point Design	**A59 - A74**
P	M	K			H	**DREAM DRILL X**	Ø1.0mm - Ø20.0mm	662 Item	3xD 5xD 8xD	- With Coolant - Without Coolant	• **RCH-Coating Drill for Extended Tool Life** in Carbon Steels, Alloy Steels, and Cast Iron(Nano Layered Multilayer Coated Drill) • Extreme Wear Resistance / High Heat Endurance / Chipping Protection	**A75 - A94**
P	M	K			H	**DREAM DRILLS - GENERAL**	Ø1.0mm - Ø20.0mm	1,098 Item	3xD 5xD 8xD	- With Coolant - Without Coolant	• **Solid Carbide Drill for Carbon Steels, Alloy Steels, and Cast Iron** • Self-Centering / Large Offering(Intermediate sizes)	**A95 - A116**
P	M		N	S		**DREAM DRILLS - INOX**	Ø1.0mm - Ø20.0mm	329 Item	3xD 5xD 8xD	- With Coolant	• For **Stainless Steels** • Lower Torque / Improved Chip Formation	**A135 - A145**
			N			**DREAM DRILLS - ALU**	Ø3.0mm - Ø20.0mm	309 Item	3xD 5xD 8xD	- With Coolant	• For **Aluminum** and **Aluminum Alloys**	**A146 - A156**
P	M	K	N			**DREAM DRILLS - FLAT BOTTOM**	Ø3.0mm - Ø20.0mm	202 Item	2xD 5xD	- With Coolant - Without Coolant	• **180° Point Angle Drill** for Holes on **Various Angled Surfaces**	**A125 - A134**
P		K				**DREAM DRILLS - MQL Type**	Ø3.0mm - Ø14.0mm	123 Item	10xD 15xD 20xD 25xD 30xD	- With Coolant	• For Drilling **Deep Holes** (10xD - 30xD) • Polished flutes for Enhanced chip evacuation	**A157 - A164**
					H	**DREAM DRILLS - for HIGH HARDENED STEELS**	Ø2.6mm - Ø14.0mm	34 Item	3xD	- Without Cooalnt	• For **High Hardened Steels** HRc50 to HRc70 • Minimum of Cutting load through Special Thinning	**A165 - A168**
P	M	K	N	S		**GENERAL CARBIDE DRILLS**	Ø1.0mm - Ø13.0mm	167 Item	Stub Jobber	- Without Cooalnt	• For General Purpose	**A169 - A176**

CARBIDE INSERT DRILLS & HOLDERS

P		K				**i-ONE DRILLS**	Ø10.0mm - Ø33.73mm	487 Item	3xD 5xD 8xD	- With Coolant	• **High-Performance Exchangeable Drill** for General Steels and Cast Iron • Secure and Quick Clamping System	**A21 - A38**
P	M	K	N			**i-DREAM DRILLS**	Ø12.0mm - Ø31.75mm	662 Item	3xD 5xD 7xD	- With Coolant	• **Exchangeable Drill** for General Steels and Stainless Steels • High-Strength Insert Available for Steel and Stainless Steel.	**A39 - A58**

TOOL SELECTION for THREADING

P M K N S H : Excellent

P M K N S H : Good

Work Material						Item	Thread Size Range		Thread Form	Tool Material	Features	Catalog Page
P	M	K	N	S	H		Metric	Inch				
P	M	K	N	S	H	THREAD MILLS	M1 - M20	1/16" - 1"	M, MF, UNC, UNF, NPT, BSP(G)	CARBIDE	• Carbide Thread Mill for **Large Diameter and Precision Thread** • Covering Wide Range of Materials / Produce Full Threads to the Bottom	B33 - B56
P	M	K	N			SYNCHRO TAPS	M3 - M20	-	M, MF	HSS-PM	• HSS-PM Tap for **High Speed Tapping** on Rigid CNC Machine • High productivity / **3 Times Faster** than Conventional Tap	B57 - B74
P	M	K	N			PRIME TAPS	M2 - M24	#4 - 1"	M, MF, UNC, UNF	HSS-PM	• **High performance HSS-PM Tap for Multi-Purpose** • Prevent Over & Under Feeding / Extended Tool Life	B75 - B88
P	M	K	N			COMBO TAPS	M2 - M52	#4 - 1"	M, MF, UNC, UNF	HSS-E	• **HSS-E Tap for Multi-Purpose** • Prevent Over & Under Feeding	B89 - B132
P	M			S		YG TAP STEEL	M2 - M52	#4 - 1"	M, MF, UNC, UNF	HSS-PM HSS-E	• For Carbon Steels and Alloy Steels	B133 - B160
P						YG TAP CHIP BREAKER	M4 - M20	-	M, MF	HSS-E	• TiN Coated Tap with **Chip Breaker for Steel Materials** • Avoiding bird nesting / Solution for long chips	B161 - B170
P	M		N	S		YG TAP INOX	M2 - M30	#4 - 1"	M, MF, UNC, UNF	HSS-PM HSS-E	• For Stainless Steels	B171 - B194
		K	N		H	YG TAP CAST IRON	M2 - M30	#10 - 1"	M, MF, UNC, UNF	CARBIDE HSS-E	• For Cast Iron	B195 - B206
P	M		N		H	YG TAP HARDENED	M2 - M30	-	M	CARBIDE HSS-E	• For Hardened Steels	B207 - B218
P				S	H	YG TAP Ti Ni	M2 - M30	-	M	HSS-PM	• For Heat Resistent Super Alloys and Titanium Alloys	B219 - B234
P			N			YG TAP ALU	M2 - M30	#4 - 3/4"	M, MF, UNC, UNF	HSS-E	• For long-chipping Aluminum & Aluminum Alloys	B235 - B248
P	M		N			YG TAP FORMING	M2 - M20	#5 - 3/4"	M, MF, UNC	HSS-PM HSS-E	• Tapping by Forming Soft Materials	B249 - B266
P	M	K	N			YG TAP GENERAL	M2 - M30	#4 - 1-1/8"	M, MF, UNC, UNF, BSW	HSS HSS-E	• For General Purpose	B267 - B296
P	M		N			HAND TAP	M2 - M52	#2 - 1-1/4"	M, MF, UNC, UNF, BSW	HSS	• For Hand Tapping • ISO Hand Tap Available	B297 - B308

GUIDE LINE TO ICONS

Tool Material

- CBN — Cubic Boron Nitride
- CARBIDE — Carbide
- HSS PM — YG-1 Premium Powder Metallurgy HSS
- PM 60 — Powder Metallurgy HSS
- HSS Co8 — 8% Cobalt HSS
- HSS-E — 5% Cobalt HSS
- HSS — High Speed Steel

No. of Flute

2 | 3 | 3&4 | 4-6

Point Angle

120° | 135° | 140° | 180°

The Type of Shank

- PLAIN / DIN 6535HA — Plain shank (with DIN Standard)
- FLAT / DIN 6535HB — Flat shank (with DIN Standard)
- 1~5 — Range of Morse Taper Shank

Standard of Tools

- YG STD — YG-1 Standard
- DIN 327 | DIN 844 | DIN 1889
- DIN 333 | DIN 1869/1 | DIN 1870/1 — Number of DIN Standard
- DIN 371/376 | DIN 374 | DIN 5157

Surface Treatment

- C-Coating — YG-1 C-Coating
- RCH-Coating — YG-1 RCH-Coating
- BLUE — YG-1 Blue-Coating
- AlTiN — Aluminum Titanium Nitride Coating
- X-Coating — YG-1 X-Coating
- XC-Coating — YG-1 XC-Coating
- Z-Coating — YG-1 Z-Coating
- Y-Coating — YG-1 Y-Coating
- Diamond — Diamond Coating
- TiAlN — Titanium Aluminum Nitride Coating
- DLC — Diamond-Like Carbon Coating
- Uncoated — Non-coated
- Hardslick — TiAlN + WC/C Coating
- TiN — Titanium Nitride Coating
- TiCN — Titanium Carbon Nitride Coating
- Homo — Steam Tempered (Black Oxide finish)
- Bright — Bright Finish

The Type of Periphery

- NR — Roughing - Coarse
- WR — Roughing - Aluminium
- NF — Roughing & Finishing
- HR — Roughing - Fine

Helix Angle

- 30° | 30° — End mills
- 30° | N 20~30° — Drills
- R40 | R45 — Taps
- LH7° | LH45° — Reamers

Thread Angle

60° | 55°

Class of Thread

6H | 6H+0.1 | 6HX

Coolant Supply Pressure

- 45 bar — Internal Coolant Suppy at 45 bar average pressure
- 20 bar — Internal Coolant Suppy at 20 bar average pressure

Tolerance of Dimension

- m7 | h8 — Tolerance of Outside Diameter
- h7 | h8 — Tolerance of Shank Diameter

O.D. Tolerance of Reamer

H7 — DIN 1420 for H7 Reamed Hole

Tolerance of Radius

- R ±0.005 | R ±0.01 — Tolerance of Ball Radius ±0.005, ±0.01 mm
- R ±0.010 | R ±0.015 — Tolerance of Corner Radius ±0.005, ±0.015 mm

Cutting Condition

- Milling
- Drills
- Reamers
- Countersinks
- Taps

Chamfer Lead Acc. to DIN2197

- I/II/III | I/III — Set of Hand Taps
- LONG — Long Chamfer Lead for Nut Tap
- B — Form B (with Gun-nose and Chamfer Lead 4-5 Thread)
- C — Form C (Chamfer Lead 2-3 Thread)
- E — Form E (Chamfer Lead 1.5-2 Thread)

Chamfer Angle

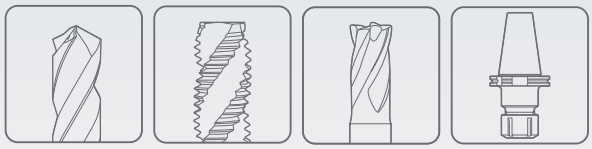
15° | 45° — Reamers

Working Material

- GS — Steels with good machinability Rm<850N/mm2
- VG — Heat treated and heat-resistant steels 850N/mm2 ≤Rm≤1,200N/mm2
- HR — High alloyed steels Rm>1,200N/mm2
- VA — Stainless steels
- NW — Carbon steels with low contents of alloys Rm<700N/mm2
- Ti — Titanium alloys
- Ni — Nickel alloys
- GV — Any material with at least 8~10% elongation
- Al — Aluminum & Aluminum alloys
- GG — Grey Cast Iron
- Ms — Brass
- MU — Multi-Purpose

YG

Global Cutting Tool Leader **YG-1**



YG CUTTING TOOLS

HOLEMAKING TOOLS

i-ONE DRILLS, CARBIDE INSERTS & HOLDERS
i-DREAM DRILLS, CARBIDE INSERTS & HOLDERS
SOLID CARBIDE DREAM DRILLS - PRO (with & without Coolant Holes)
SOLID CARBIDE DREAM DRILL X (with & without Coolant Holes)
SOLID CARBIDE DREAM DRILLS - GENERAL (with & without Coolant Holes)
SOLID CARBIDE DREAM DRILLS - HIGH FEED (with Coolant Holes)
SOLID CARBIDE DREAM DRILLS - FLAT BOTTOM (with & without Coolant Holes)
SOLID CARBIDE DREAM DRILLS - INOX (with Coolant Holes)
SOLID CARBIDE DREAM DRILLS - ALU (with Coolant Holes)
SOLID CARBIDE DREAM DRILLS - MQL TYPE (with Coolant Holes)
SOLID CARBIDE DREAM DRILLS for HIGH HARDENED STEELS (without Coolant Holes)
GENERAL SOLID CARBIDE DRILLS (JOBBER & STUB LENGTH)
HSS-PM MULTI-1 DRILLS
HSS Co8 & HSS-E HPD STRAIGHT SHANK DRILLS
HSS & HSS-E GOLD-P DRILLS
SUPER HSS SUPER-GP DRILLS
HSS, HSS-E & HSS Co8 STRAIGHT SHANK DRILLS
HSS & HSS-E MORSE TAPER SHANK DRILLS
SOLID CARBIDE & HSS Co8 NC-SPOTTING DRILLS
SOLID CARBIDE, HSS & HSS-E CENTER DRILLS
SPADE DRILLS, INSERTS & HOLDERS
CARBIDE, HSS & HSS-E REAMERS
HSS & HSS Co8 COUNTERSINKS
HSS-E COUNTERBORES

YG-1 CO., LTD.

CONTENTS

EXCHANGEABLE CARBIDE DRILLS

SOLID CARBIDE DRILLS

HSS DRILLS

CARBIDE & HSS DRILLS

CARBIDE & HSS INSERT DRILLS

REAMERS

COUNTERSINKS

COUNTERBORES

YG-1 CO., LTD.

SELECTION GUIDE

YG HOLEMAKING TOOLS

i-ONE DRILLS INSERTS

SERIES	Y101H	Y121H	Y141H	Y161H	Y181H	Y201H
TOOL MATERIAL	CARBIDE					
SIZE MIN	10.00	12.00	14.00	16.00	18.00	20.00
SIZE MAX	11.90	13.90	15.90	17.90	19.80	21.83
PAGE	A24	A25	A26	A27	A28	A29
SURFACE TREATMENT	H-Coating					

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◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	HB	HRc	Y101H	Y121H	Y141H	Y161H	Y181H	Y201H
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎
	11		325	35	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15						
	13		240	23						
	14		180	10						
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎
	16		260	26	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130		◎	◎	◎	◎	◎	◎
	20		230	21	◎	◎	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	60							
	22		100							
	23	Aluminum-cast, alloyed	75							
	24		90							
	25		130							
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55						
	39		630	60						
	40	Chilled Cast Iron	400	42						
	41	Hardened Cast Iron	550	55						

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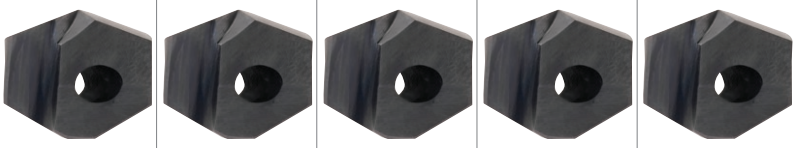
YG-1 CO., LTD.

SELECTION GUIDE

HOLEMAKING TOOLS

i-DREAM DRILLS INSERTS

SERIES	YA1A	YA2C	YB1A	YB2C	YC1A	YC2C	YD1A	YD2C	YE1A	YE2C
TYPE	A		B		C		D		E	
TOOL MATERIAL	CARBIDE									
SIZE MIN	12.00		14.00		16.00		18.00		20.00	
SIZE MAX	13.89		15.87		17.86		19.80		21.83	
PAGE	A44		A45		A46		A47		A48	
SURFACE TREATMENT	TiAlN	TiCN	TiAlN	TiCN	TiAlN	TiCN	TiAlN	TiCN	TiAlN	TiCN



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◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	HB	HRc								
P	1	Non-alloy steel	125		◎	○	◎	○	◎	○	◎	○	◎	○
	2		190	13	◎	○	◎	○	◎	○	◎	○	◎	○
	3		250	25	◎	○	◎	○	◎	○	◎	○	◎	○
	4		270	28	◎	○	◎	○	◎	○	◎	○	◎	○
	5		300	32	◎		◎		◎		◎		◎	
	6	Low alloy steel	180	10	◎	○	◎	○	◎	○	◎	○	◎	○
	7		275	29	◎	○	◎	○	◎	○	◎	○	◎	○
	8		300	32	◎		◎		◎		◎		◎	
	9		350	38	◎		◎		◎		◎		◎	
	10	High alloyed steel, and tool steel	200	15	◎	○	◎	○	◎	○	◎	○	◎	○
	11		325	35	◎		◎		◎		◎		◎	
M	12	Stainless steel	200	15		◎		◎		◎		◎		◎
	13		240	23		◎		◎		◎		◎		◎
	14		180	10		◎		◎		◎		◎		◎
K	15	Grey cast iron	180	10	◎		◎		◎		◎		◎	
	16		260	26	◎		◎		◎		◎		◎	
	17	Nodular cast iron	160	3	◎		◎		◎		◎		◎	
	18		250	25	◎		◎		◎		◎		◎	
	19	Malleable cast iron	130		◎		◎		◎		◎		◎	
	20		230	21	◎		◎		◎		◎		◎	
N	21	Aluminum-wrought alloy	60			○		○		○		○		○
	22		100			○		○		○		○		○
	23	Aluminum-cast, alloyed	75			○		○		○		○		○
	24		90			○		○		○		○		○
	25		130			○		○		○		○		○
	26	Copper and Copper Alloys (Bronze / Brass)	110			○		○		○		○		○
	27		90			○		○		○		○		○
	28		100			○		○		○		○		○
	29	Non Metallic Materials												
	30													
S	31	Heat Resistant Super Alloys	200	15										
	32		280	30										
	33		250	25										
	34		350	38										
	35		320	34										
	36	Titanium Alloys	400 Rm											
	37		1050 Rm											
H	38	Hardened steel	550	55										
	39		630	60										
	40	Chilled Cast Iron	400	42										
	41	Hardened Cast Iron	550	55										

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SELECTION GUIDE

YG HOLEMAKING TOOLS

SPADE DRILLS INSERTS

SERIES	1~8	Y,Z,0,1~4	Y,Z,0,1,2	Y,Z,0,1,2	Y,Z,0,1~3	Y,Z,0,1~3
TOOL MATERIAL	HSS M4	SUPER HSS T15	PREMIUM HSS M48	CARBIDE K10	CARBIDE K20	CARBIDE P40
POINT	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD
SIZE MIN	Ø18(#1)	Ø9.5(#Y)	Ø9.5(#Y)	Ø9.5(#Y)	Ø9.8(#Y)	Ø9.5(#Y)
SIZE MAX	Ø114.3(#8)	Ø65.09(#4)	Ø35(#2)	Ø34(#2)	Ø47(#3)	Ø47(#3)
PAGE	A310	A315	A320	A323	A325	A328
SURFACE TREATMENT	TiN / TiCN / TiAlN					

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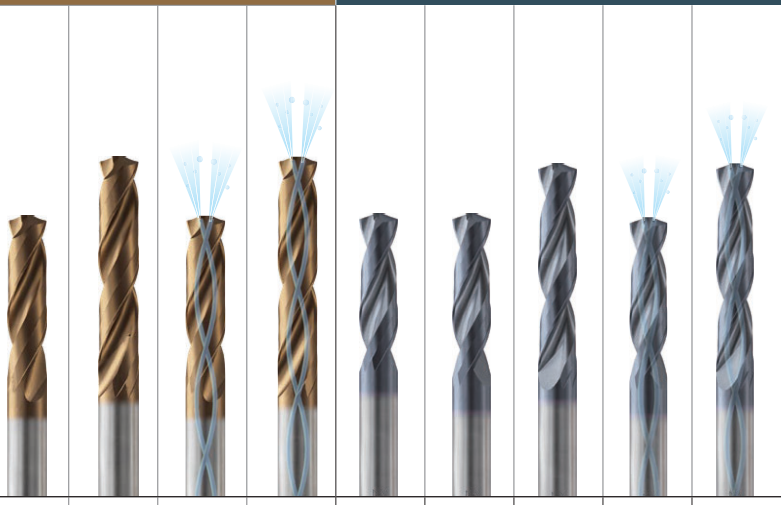
◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		○	◎	◎		○	◎
	2		190	13	○	◎	◎		○	◎
	3		250	25	○	◎	◎		○	◎
	4		270	28	○	◎	◎		○	◎
	5		300	32						
	6	Low alloy steel	180	10	○	◎	◎		○	◎
	7		275	29	○	◎	◎		○	◎
	8		300	32		○	◎		○	◎
	9		350	38		○	◎		○	◎
	10	High alloyed steel, and tool steel	200	15		○	◎		○	◎
	11		325	35		○	◎		○	◎
M	12	Stainless steel	200	15		○	○		◎	○
	13		240	23		○	○		◎	○
	14		180	10		○	○		◎	○
K	15	Grey cast iron	180	10	◎	○	○	◎	○	○
	16		260	26	○	◎	◎	◎	○	○
	17	Nodular cast iron	160	3	◎	○	○	◎	○	○
	18		250	25	○	◎	◎	◎	○	○
	19	Malleable cast iron	130		◎	○	○	◎	○	○
	20		230	21	○	◎	◎	◎	○	○
N	21	Aluminum-wrought alloy	60		◎	○	○		◎	○
	22		100		◎	○	○		◎	○
	23	Aluminum-cast, alloyed	75							
	24		90							
	25		130							
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90		◎	○	○		◎	○
	28		100							
	29	Non Metallic Materials								
	30									
S	31	Heat Resistant Super Alloys	200	15		◎	◎		◎	○
	32		280	30		○	◎		◎	○
	33		250	25		○	◎		◎	○
	34		350	38		○	◎		◎	○
	35		320	34		○	◎		◎	○
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55		○	◎		○	◎
	39		630	60						
	40	Chilled Cast Iron	400	42						
	41	Hardened Cast Iron	550	55						

SELECTION GUIDE

HOLEMAKING TOOLS

	DREAM DRILLS -PRO				DREAM DRILLS X				
SERIES	DGN523	DGN526	DGN506	DGN508	DTX404	DTX423	DTX424	DTX406	DTX408
DRILLING DEPTH	3XD	5XD	3XD	5XD	3XD		5XD	3XD	5XD
TOOL MATERIAL	CARBIDE				CARBIDE				
LENGTH	SHORT	LONG	SHORT	LONG	STUB	SHORT	LONG	SHORT	LONG
SIZE MIN	D3.0	D1.0	D3.0	D1.2	D3.0	D3.0	D1.0	D3.0	D1.0
SIZE MAX	D20.0	D19.5	D19.5	D20.0	D20.0	D20.0	D20.0	D20.0	D20.0
PAGE	A62	A64	A68	A69	A78	A80	A82	A85	A87
SURFACE TREATMENT	Z-Coating				RCH-Coating				



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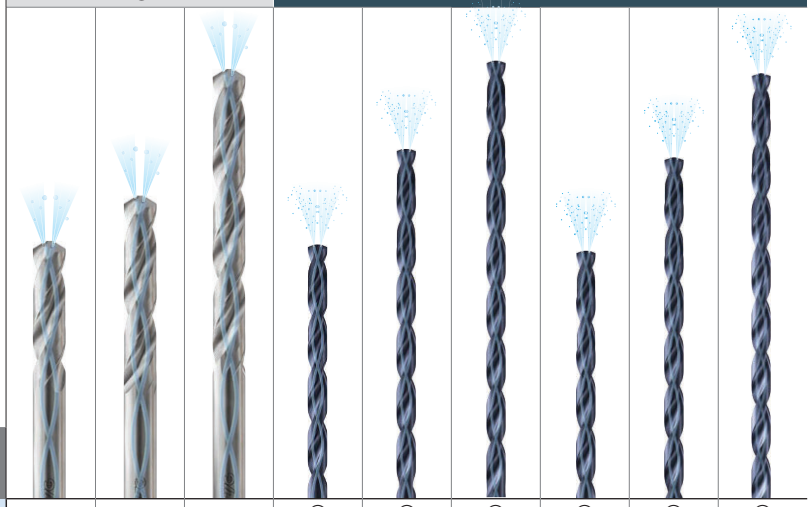
◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	HB	HRc	DGN523	DGN526	DGN506	DGN508	DTX404	DTX423	DTX424	DTX406	DTX408
P	1	Non-alloy steel	125										
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎	◎
	5		300	32	○	○	○	○	○	○	○	○	○
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎	◎
	8		300	32	○	○	○	○	○	○	○	○	○
	9		350	38	○	○	○	○	○	○	○	○	○
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎	◎
	11		325	35	○	○	○	○	○	○	○	○	○
M	12	Stainless steel	200	15	○	○	○	○	○	○	○	○	○
	13		240	23	○	○	○	○	○	○	○	○	○
	14		180	10									
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎
	16		260	26	○	○	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎	◎	◎	◎
	18		250	25	○	○	○	○	○	○	○	○	○
	19	Malleable cast iron	130		◎	◎	◎	◎	◎	◎	◎	◎	◎
	20		230	21	○	○	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60										
	22		100										
	23	Aluminum-cast, alloyed	75										
	24		90										
	25		130										
	26	Copper and Copper Alloys (Bronze / Brass)	110										
	27		90										
	28		100										
	29	Non Metallic Materials											
	30												
S	31	Heat Resistant Super Alloys	200	15									
	32		280	30									
	33		250	25									
	34		350	38									
	35		320	34									
	36	Titanium Alloys	400 Rm										
	37		1050 Rm										
H	38	Hardened steel	550	55	○	○	○	○	○	○	○	○	○
	39		630	60									
	40	Chilled Cast Iron	400	42									
	41	Hardened Cast Iron	550	55									

SELECTION GUIDE

HOLEMAKING TOOLS

	DREAM DRILLS -ALU			DREAM DRILLS - MQL TYPE					
SERIES	D5432	D5433	D5434	DH510	DH515	DH520	DHM10	DHM15	DHM20
DRILLING DEPTH / STANDARD	3XD	5XD	8XD	10XD	15XD	20XD	10XD	15XD	20XD
TOOL MATERIAL	CARBIDE			CARBIDE					
LENGTH	SHORT	LONG	EXTRA LONG	EXTRA LONG					
SIZE MIN	D3.0	D3.0	D3.0	D3.0	D3.0	D3.0	D3.0	D3.0	D3.0
SIZE MAX	D20.0	D20.0	D14.0	D14.0	D12.0	D10.0	D13.5	D12.0	D12.0
PAGE	A148	A151	A153	A160	A161		A162		
SURFACE TREATMENT	Bright			TiAlN					



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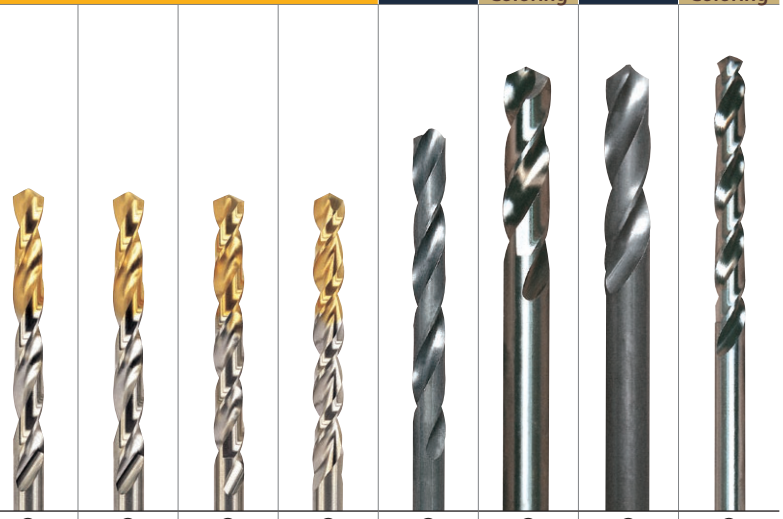
ISO	VDI 3323	Material Description	HB	HRc	D5432	D5433	D5434	DH510	DH515	DH520	DHM10	DHM15	DHM20
P	1	Non-alloy steel	125					◎	◎	◎	◎	◎	◎
	2		190	13				◎	◎	◎	◎	◎	◎
	3		250	25				○	○	○	○	○	○
	4		270	28									
	5		300	32									
	6	Low alloy steel	180	10				◎	◎	◎	◎	◎	◎
	7		275	29				○	○	○	○	○	○
	8		300	32				○	○	○	○	○	○
	9		350	38									
	10	High alloyed steel, and tool steel	200	15				○	○	○	○	○	○
	11		325	35				○	○	○	○	○	○
M	12	Stainless steel	200	15									
	13		240	23									
	14		180	10									
K	15	Grey cast iron	180	10				◎	◎	◎	◎	◎	◎
	16		260	26				○	○	○	○	○	○
	17	Nodular cast iron	160	3				◎	◎	◎	◎	◎	◎
	18		250	25				○	○	○	○	○	○
	19	Malleable cast iron	130					◎	◎	◎	◎	◎	◎
	20		230	21				○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60		◎	◎	◎						
	22		100		◎	◎	◎						
	23	Aluminum-cast, alloyed	75		◎	◎	◎						
	24		90		◎	◎	◎						
	25		130										
	26	Copper and Copper Alloys (Bronze / Brass)	110										
	27		90										
	28		100										
	29	Non Metallic Materials											
	30												
S	31	Heat Resistant Super Alloys	200	15									
	32		280	30									
	33		250	25									
	34		350	38									
	35		320	34									
	36	Titanium Alloys	400 Rm										
	37		1050 Rm										
H	38	Hardened steel	550	55									
	39		630	60									
	40	Chilled Cast Iron	400	42									
	41	Hardened Cast Iron	550	55									

SELECTION GUIDE

YG HOLEMAKING TOOLS

	GOLD-P DRILLS				SUPER-GP DRILLS	STRAIGHT SHANK DRILLS		
SERIES	D1GP125	D1GP165	DLGP195	DLGP506	DSH105	D2107	D1107	D2105
STANDARD	DIN 338	DIN 338	DIN 338	DIN 338	DIN 338	DIN 1897	DIN 1897	DIN 338
TOOL MATERIAL	HSS				HSS	HSS Co8	HSS	HSS Co8
LENGTH	JOBBER	JOBBER	JOBBER	JOBBER	JOBBER	STUB	STUB	JOBBER
SIZE MIN	D1.0	D1.6	D1.0	D2.0	D2.0	D1.0	D1.1	D1.0
SIZE MAX	D13.0	D13.0	D13.0	D13.0	D13.0	D30.0	D13.0	D20.0
PAGE	A208	A212	A213	A216	A223	A232	A235	A237
SURFACE TREATMENT	TiN				Vap	Gold Coloring	Vap	Gold Coloring



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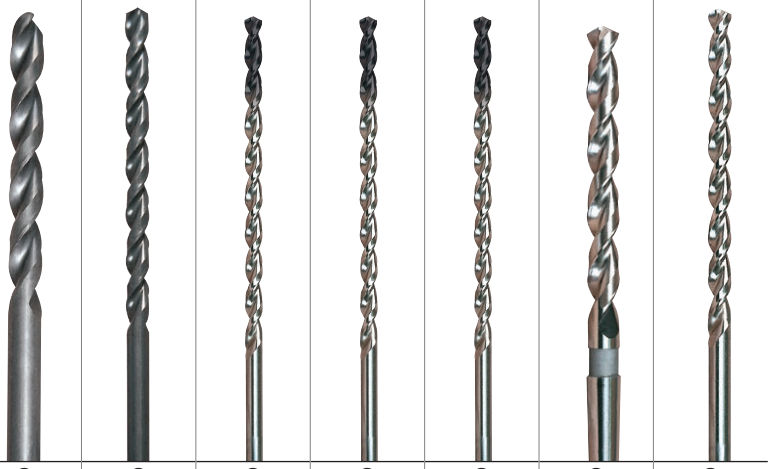
ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	○	○	○	○	○	○	○	○
	5		300	32								
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎
	7		275	29	○	○	○	○	○	○	○	○
	8		300	32	○	○	○	○	○	○	○	○
	9		350	38								
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○	○
	11		325	35								
M	12	Stainless steel	200	15	◎	◎	◎		○	◎	○	◎
	13		240	23	○	○	○		○	○	○	○
	14		180	10	○	○	○		○	○	○	○
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○	○
	18		250	25				○				
	19	Malleable cast iron	130		○	○	○	○	○	○	○	○
	20		230	21				○				
N	21	Aluminum-wrought alloy	60		○	○	○		○	○	○	○
	22		100		○	○	○		○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○		○	○	○	○
	24		90									
	25		130									
	26	Copper and Copper Alloys (Bronze / Brass)	110									
	27		90									
	28		100									
	29	Non Metallic Materials			○	○	○		○	○	○	○
	30											
S	31	Heat Resistant Super Alloys	200	15								
	32		280	30								
	33		250	25								
	34		350	38								
	35		320	34								
	36	Titanium Alloys	400 Rm		○	○	○		○	○	○	○
	37		1050 Rm									
H	38	Hardened steel	550	55								
	39		630	60								
	40	Chilled Cast Iron	400	42								
	41	Hardened Cast Iron	550	55								

SELECTION GUIDE

HOLEMAKING TOOLS

STRAIGHT SHANK DRILLS

SERIES	DH100 DL505	DH100 DL504	DH100 DT600	DH100 DT692	DH100 DT693	DH100 DL608	DH50 DL507
STANDARD	DIN 338	DIN 340	DIN 1869/1	DIN 1869/2	DIN 1869/3	DIN 341	-
TOOL MATERIAL	HSS-E					HSS-E	
LENGTH	JOBBER	LONG	EXTRA LONG			LONG	EXTRA LONG
SIZE MIN	D2.0	D2.0	D2.0	D3.0	D4.0	D13.0	D2.0
SIZE MAX	D12.8	D13.0	D10.5	D10.2	D10.0	D30.0	D13.0
PAGE	A263	A265	A266			A267	A268
SURFACE TREATMENT	Vap		TiAlN			Bright	



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ISO	VDI 3323	Material Description	HB	HRc	DH100 DL505	DH100 DL504	DH100 DT600	DH100 DT692	DH100 DT693	DH100 DL608	DH50 DL507
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	○
	2		190	13	◎	◎	◎	◎	◎	◎	
	3		250	25	◎	◎	◎	◎	◎	◎	
	4		270	28	○	○	○	○	○	○	
	5		300	32							
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	
	7		275	29	○	○	○	○	○	○	
	8		300	32	○	○	○	○	○	○	
	9		350	38							
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	
	11		325	35							
M	12	Stainless steel	200	15							
	13		240	23							
	14		180	10							
K	15	Grey cast iron	180	10	○	○	○	○	○	○	
	16		260	26	○	○	○	○	○	○	
	17	Nodular cast iron	160	3	○	○	○	○	○	○	
	18		250	25	○	○	○	○	○	○	
	19	Malleable cast iron	130		○	○	○	○	○	○	
	20		230	21	○	○	○	○	○	○	
N	21	Aluminum-wrought alloy	60								◎
	22		100								◎
	23	Aluminum-cast, alloyed	75								○
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42							
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

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HOLEMAKING TOOLS

	COUNTERSINKS					CENTER DRILLS			
SERIES	C1109 C3109	C1119 C3119	C1136 C3136	C1139 C3139	C1132 C3132	D5303	DV303	DV333	DV334
TOOL MATERIAL	HSS & HSS Co8					CARBIDE	HSS-E	HSS-E	HSS-E
STANDARD / HOLE TYPE	-	-	DIN 334C	DIN 335C	-	-	-	-	-
POINT ANGLE / FORM TYPE / FLUTE	90°	90°	60°	90°	120°	FORM A	FORM A	FORM A	FORM A
SIZE MIN	D10.0	D10.0	D6.3	D4.3	D8.0	D1.0	D0.5	D1.6	D1.0
SIZE MAX	D50.0	D50.0	D25.0	D31.0	D25.0	D6.3	D6.3	D6.3	D5.0
PAGE	A392	A393	A394	A395	A396	A298	A299		A300
SURFACE TREATMENT	Bright					Bright			

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ISO	VDI 3323	Material Description	HB	HRc								
P	1	Non-alloy steel	125		○	○	◎	◎	◎	◎	◎	◎	◎
	2		190	13	○	○	◎	◎	◎	◎	◎	◎	◎
	3		250	25	○	○	○	○	○	◎	○	○	○
	4		270	28	○	○	○	○	○				
	5		300	32	○	○	○	○	○				
	6	Low alloy steel	180	10						◎	◎	◎	◎
	7		275	29						○	○	○	○
	8		300	32									
	9		350	38									
	10	High alloyed steel, and tool steel	200	15									
	11		325	35									
M	12	Stainless steel	200	15	○	○	○	○	○	○	○	○	○
	13		240	23	○	○	○	○	○				
	14		180	10	○	○	○	○	○				
K	15	Grey cast iron	180	10	○	○	◎	◎	◎	◎	◎	◎	◎
	16		260	26	○	○	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○				
	19	Malleable cast iron	130		○	○	○	○	○	○	○	○	○
	20		230	21	○	○	○	○	○				
N	21	Aluminum-wrought alloy	60		○	○	◎	◎	◎				
	22		100		○	○	○	○	○				
	23	Aluminum-cast, alloyed	75		○	○	○	○	○				
	24		90		○	○	○	○	○				
	25		130		○	○	○	○	○				
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○				
	27		90		○	○	○	○	○				
	28		100		○	○	○	○	○				
	29	Non Metallic Materials											
	30												
S	31	Heat Resistant Super Alloys	200	15									
	32		280	30									
	33		250	25									
	34		350	38									
	35		320	34									
	36	Titanium Alloys	400 Rm										
	37		1050 Rm										
H	38	Hardened steel	550	55									
	39		630	60									
	40	Chilled Cast Iron	400	42									
	41	Hardened Cast Iron	550	55									

SELECTION GUIDE

YG HOLEMAKING TOOLS

	REAMERS					COUNTERBORES		
SERIES	K2111	K2121	K2102	K2112	K21B1	EL950		
STANDARD	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E		
TOOL MATERIAL						MEDIUM	FINE	BEOFRE THREADING
LENGTH	LH Spiral	LH Spiral (Quick Spiral)	Straight	LH Spiral	LH Spiral			
SIZE MIN	D2.0	D4.0	D10.0	D10.0	D2.0	3.4~14.0	3.2~13.0	2.5~10.2
SIZE MAX	D20.0	D20.0	D50.0	D50.0	D20.0	6.0~20.0		
PAGE	A374	A376	A378	A379	A383	A401		
SURFACE TREATMENT	Bright					Bright		

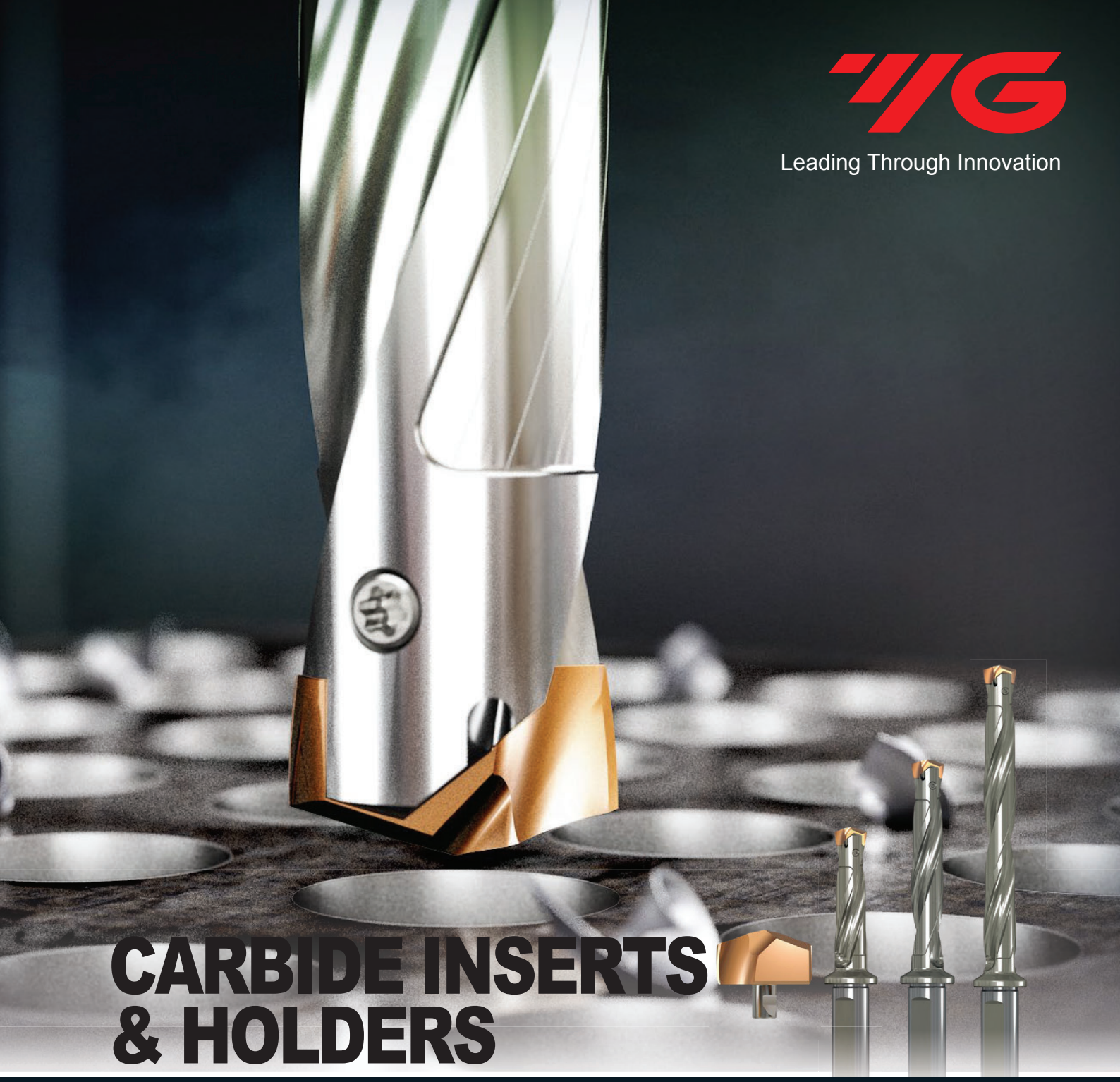
Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	HB	HRc	K2111	K2121	K2102	K2112	K21B1	EL950
P	1	Non-alloy steel	125		◎	○	◎	◎	◎	◎
	2		190	13	◎	○	◎	◎	◎	◎
	3		250	25	○		○	○	○	◎
	4		270	28	○		○	○	○	◎
	5		300	32						◎
	6	Low alloy steel	180	10	◎	○	◎	◎	◎	◎
	7		275	29	○		○	○	○	◎
	8		300	32						◎
	9		350	38						○
	10	High alloyed steel, and tool steel	200	15	○		○	○	○	◎
	11		325	35						○
M	12	Stainless steel	200	15	○		○	○	○	
	13		240	23	○		○	○	○	
	14		180	10	○		○	○	○	
K	15	Grey cast iron	180	10	○		○	○	○	
	16		260	26	○		○	○	○	
	17	Nodular cast iron	160	3	○		○	○	○	
	18		250	25	○		○	○	○	
	19	Malleable cast iron	130		○		○	○	○	
	20		230	21	○		○	○	○	
N	21	Aluminum-wrought alloy	60		○	◎	○	○	○	○
	22		100		○	◎	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	◎	○	○	○	○
	24		90		○	◎	○	○	○	○
	25		130							
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	◎	○	○	○	
	27		90		○	◎	○	○	○	
	28		100		○	◎	○	○	○	
	29	Non Metallic Materials								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55						
	39		630	60						
	40	Chilled Cast Iron	400	42						
	41	Hardened Cast Iron	550	55						

YG

Leading Through Innovation



CARBIDE INSERTS & HOLDERS

i- ONE DRILLS

i-One Drills

- **High Performance Exchangeable for General Steels and Cast Iron**
- **Leistungsstarke, austauschbare Bohrwerkzeuge für allgemeine Stähle und Gusseisen**

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	Y101H	Y121H	Y141H	Y161H
SIZE MIN	10.00	12.00	14.00	16.00
SIZE MAX	11.90	13.90	15.90	17.90
PAGE	A24	A25	A26	A27
SURFACE TREATMENT	H-Coating			

CARBIDE INSERTS & HOLDERS

i-ONE DRILLS

High Performance Exchangeable
for General Steels and Cast Iron

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Recommended cutting conditions : p.A34

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	Y101H	Y121H	Y141H	Y161H
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic10		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	◎	◎	◎
	20		Pearlitic		230	21	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

i - ONE DRILLS

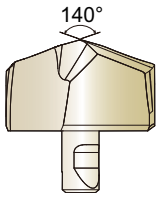
Y101H SERIES

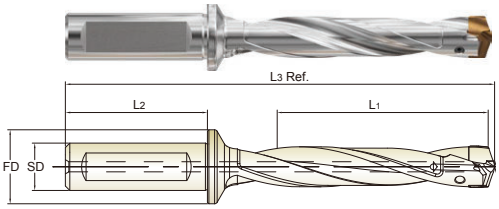
i-ONE DRILL INSERTS & HOLDERS

i-ONE DRILL EINSÄTZE UND HALTER
PLAQUETTES ET PORTE-PLAQUETTE i-ONE DRILL
INSERTI & PORTAINSERTI i-ONE DRILL

- Applications
▶For carbon steels, alloy steels and cast iron.
▶Holder length: 3xD, 5xD, 8xD
- Benefits
▶Secure and quick clamping system.
▶High performance with cost efficiency.
▶Multi-layered coating delivers outstanding productivity and reliability.

- Anwendungen
▶Für Kohlenstoffstähle, legierte Stähle und Gusseisen.
▶Halterlänge: 3xD, 5xD, 8xD
- Vorteile
▶Sicheres und schnelles Spannsystem.
▶Hohe Leistungsfähigkeit bei gleichzeitiger Kosteneffizienz.
▶Mehrschichtige Beschichtung bietet hervorragende Produktivität und Zuverlässigkeit.





CARBIDE | ISO 9766 | h7 | 140° | H Coating

p.A34

Unit : mm

Series Range (mm)	Insert EDP No. H-Coating	Insert O.D. h7 dec.	Insert O.D. h7 frac.	Insert O.D. h7 mm	Holder EDP No.	Shank Dia. SD	Shank Length L2	Flange Dia. FD	Drilling Depth	L1	Overall Length L3 Ref.	Screw No.
S10 Ø10.00 to Ø11.99	Y101H1000	0.3937	-	10.00	ZD10003016	16	48	23	3D	31.5	103.0	TX1011P5
	Y101H1010	0.3976	-	10.10	ZD10005016				5D	52.5	123.0	
	Y101H1020	0.4016	-	10.20	ZD10008016				8D	84.0	153.0	
	Y101H1030	0.4055	-	10.30								
	Y101H1050	0.4134	-	10.50	ZD10503016	16	48	23	3D	33.0	104.0	
	Y101H1060	0.4173	-	10.60	ZD10505016				5D	55.0	125.0	
	Y101H1070	0.4213	-	10.70	ZD10508016				8D	88.0	156.5	
	Y101H1080	0.4252	-	10.80								
	Y101H1090	0.4291	-	10.90								
	Y101H1100	0.4331	-	11.00	ZD11003016	16	48	23	3D	34.5	105.0	
	Y101H1110	0.4370	-	11.10	ZD11005016				5D	57.5	127.0	
	Y101H1130	0.4449	-	11.30	ZD11008016				8D	92.0	160.0	
	Y101H1140	0.4488	-	11.40								
	Y101H1150	0.4528	-	11.50	ZD11503016	16	48	23	3D	36.0	106.0	
	Y101H1151	0.4531	29/64	11.51	ZD11505016				5D	60.0	129.0	
	Y101H1160	0.4567	-	11.60	ZD11508016				8D	96.0	163.5	
	Y101H1170	0.4606	-	11.70								
	Y101H1180	0.4646	-	11.80								
	Y101H1190	0.4685	-	11.90								

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Duplex	Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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i - ONE DRILLS

Y141H SERIES

i-ONE DRILL INSERTS & HOLDERS

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PLAQUETTES ET PORTE-PLAQUETTE i-ONE DRILL
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- Applications
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▶Multi-layered coating delivers outstanding productivity and reliability.

- Anwendungen
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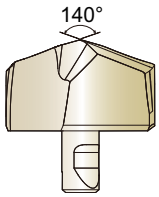

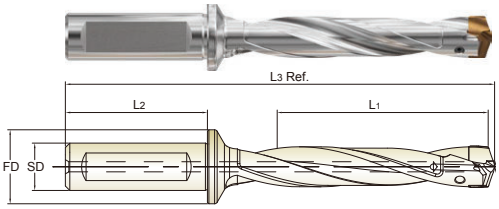

CARBIDE | ISO 9766 | h7 | 140° | H Coating

p.A34

Unit : mm

Series Range	Insert EDP No.	Insert O.D. h7			Holder EDP No.	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth		Overall Length	Screw No.
(mm)	H-Coating	dec.	frac.	mm		SD	L2	FD	L1		L3 Ref.	
S14 Ø14.00 to Ø15.99	Y141H1400	0.5512	-	14.00	ZD14003016	16	48	23	3D	43.5	116.3	TX1415P7
	Y141H1410	0.5551	-	14.10								
	Y141H1420	0.5591	-	14.20	ZD14005016				5D	72.5	144.3	
	Y141H1429	0.5625	9/16	14.29								
	Y141H1430	0.5630	-	14.30	ZD14008016				8D	116.0	186.3	
	Y141H1440	0.5669	-	14.40								
	Y141H1450	0.5709	-	14.50	ZD14503016	16	48	23	3D	45.0	118.3	
	Y141H1460	0.5748	-	14.60								
	Y141H1468	0.5781	37/64	14.68	ZD14505016				5D	75.0	147.3	
	Y141H1470	0.5787	-	14.70								
	Y141H1480	0.5827	-	14.80	ZD14508016				8D	120.0	190.8	
	Y141H1490	0.5866	-	14.90								
	Y141H1500	0.5906	-	15.00	ZD15003016	16	48	23	3D	46.5	120.3	
	Y141H1508	0.5938	19/32	15.08								
	Y141H1510	0.5945	-	15.10	ZD15005016				5D	77.5	150.3	
	Y141H1520	0.5984	-	15.20								
	Y141H1530	0.6024	-	15.30	ZD15008016				8D	124.0	195.3	
	Y141H1540	0.6063	-	15.40								
	Y141H1548	0.6094	39/64	15.48								
	Y141H1550	0.6102	-	15.50	ZD15503016	16	48	23	3D	48.0	121.3	
	Y141H1560	0.6142	-	15.60								
	Y141H1570	0.6181	-	15.70	ZD15505016				5D	80.0	152.3	
	Y141H1580	0.6220	-	15.80								
	Y141H1588	0.6250	5/8	15.88	ZD15508016				8D	128.0	198.8	
	Y141H1590	0.6260	-	15.90								

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Duplex	Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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Y181H SERIES

i-ONE DRILL INSERTS & HOLDERS

i-ONE DRILL EINSÄTZE UND HALTER
PLAQUETTES ET PORTE-PLAQUETTE i-ONE DRILL
INSERTI & PORTAINSERTI i-ONE DRILL

- Applications
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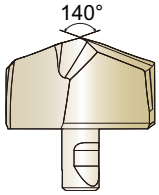

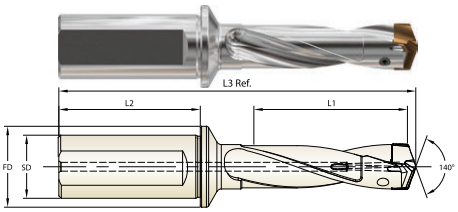

FULL-FLAT SHANK

CARBIDE | ISO 9766 | h7 | 140° | H Coating

p.A34

Unit : mm

Series Range (mm)	Insert EDP No. H-Coating	Insert O.D. h7 dec.	h7 frac.	h7 mm	Holder EDP No.	Shank Dia. SD	Shank Length L2	Flange Dia. FD	Drilling Depth	L1	Overall Length L3 Ref.	Screw No.
S18 Ø18.00 to Ø19.99	Y181H1800	0.7087	-	18.00	ZD18003025	25	56	32	3D	57.0	141.3	TX1819P9
	Y181H1810	0.7126	-	18.10								
	Y181H1820	0.7165	-	18.20								
	Y181H1826	0.7188	23/32	18.26								
	Y181H1840	0.7244	-	18.40	ZD18005025				5D	95.0	178.3	
	Y181H1850	0.7283	-	18.50								
	Y181H1860	0.7323	-	18.60	ZD18008025				8D	152.0	233.8	
	Y181H1870	0.7362	-	18.70								
	Y181H1880	0.7402	-	18.80								
	Y181H1900	0.7480	-	19.00	ZD19003025	25	56	32	3D	60.0	145.3	TX1920P9
	Y181H1910	0.7520	-	19.10								
	Y181H1950	0.7677	-	19.50	ZD19005025				5D	100.0	184.3	
	Y181H1960	0.7717	-	19.60								
	Y181H1970	0.7756	-	19.70	ZD19008025				8D	160.0	242.8	
	Y181H1980	0.7795	-	19.80								

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Duplex	Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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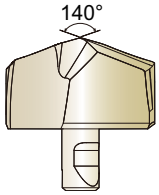
Y221H SERIES

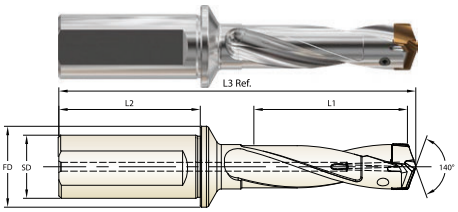
i-ONE DRILL INSERTS & HOLDERS

i-ONE DRILL EINSÄTZE UND HALTER
PLAQUETTES ET PORTE-PLAQUETTE i-ONE DRILL
INSERTI & PORTAINSERTI i-ONE DRILL

- Applications
▶For carbon steels, alloy steels and cast iron.
▶Holder length: 3xD, 5xD, 8xD
- Benefits
▶Secure and quick clamping system.
▶High performance with cost efficiency.
▶Multi-layered coating delivers outstanding productivity and reliability.

- Anwendungen
▶Für Kohlenstoffstähle, legierte Stähle und Gusseisen.
▶Halterlänge: 3xD, 5xD, 8xD
- Vorteile
▶Sicheres und schnelles Spannsystem.
▶Hohe Leistungsfähigkeit bei gleichzeitiger Kosteneffizienz.
▶Mehrschichtige Beschichtung bietet hervorragende Produktivität und Zuverlässigkeit.





FULL-FLAT SHANK

CARBIDE | ISO 9766 | h7 | 140° | H Coating

p.A34

Unit : mm

Series Range	Insert EDP No.	Insert O.D.			Holder EDP No.	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth		Overall Length	Screw No.
(mm)	H-Coating	h7										
		dec.	frac.	mm		SD	L_2	FD		L_1	L_3 Ref.	
S22 Ø22.00 to Ø23.99	Y221H2200	0.8661	-	22.00	ZD22003025	25	56	32	3D	69.0	153.4	TX2223P9
	Y221H2223	0.8750	7/8	22.23								
	Y221H2230	0.8780	-	22.30								
	Y221H2240	0.8819	-	22.40	ZD22005025				5D	115.0	198.4	
	Y221H2250	0.8858	-	22.50								
	Y221H2270	0.8937	-	22.70	ZD22008025				8D	184.0	265.9	
	Y221H2280	0.8976	-	22.80								
	Y221H2290	0.9016	-	22.90								
	Y221H2310	0.9094	-	23.10	ZD23003025	25	56	32	3D	72.0	157.4	TX2324P9
	Y221H2330	0.9173	-	23.30								
	Y221H2342	0.9219	59/64	23.42								
	Y221H2350	0.9252	-	23.50	ZD23005025				5D	120.0	204.4	
	Y221H2380	0.9370	-	23.80								
	Y221H2381	0.9375	15/16	23.81	ZD23008025				8D	192.0	274.9	
	Y221H2390	0.9409	-	23.90								

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Duplex	Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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YG i - ONE DRILLS

Y261H SERIES
Y281H SERIES

i-ONE DRILL INSERTS & HOLDERS

i-ONE DRILL EINSÄTZE UND HALTER
PLAQUETTES ET PORTE-PLAQUETTE i-ONE DRILL
INSERTI & PORTAINSERTI i-ONE DRILL

- Applications
▶For carbon steels, alloy steels and cast iron.
▶Holder length: 3xD, 5xD, 8xD
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▶High performance with cost efficiency.
▶Multi-layered coating delivers outstanding productivity and reliability.

- Anwendungen
▶Für Kohlenstoffstähle, legierte Stähle und Gusseisen.
▶Halterlänge: 3xD, 5xD, 8xD
- Vorteile
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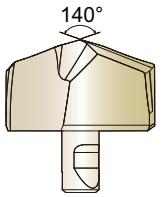
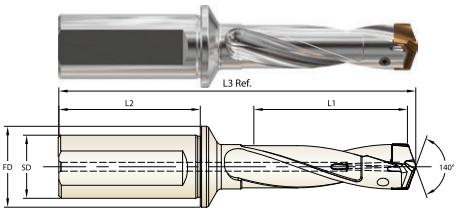
▶Mehrschichtige Beschichtung bietet hervorragende Produktivität und Zuverlässigkeit.





FULL-FLAT SHANK

CARBIDE | ISO 9766 | h7 | 140° | H Coating

p.A34

Unit : mm

Series Range (mm)	Insert EDP No. H-Coating	Insert O.D. h7 dec.	h7 frac.	h7 mm	Holder EDP No.	Shank Dia. SD	Shank Length L2	Flange Dia. FD	Drilling Depth	L1	Overall Length L3 Ref.	Screw No.
S26 Ø26.00 to Ø27.99	**Y261H2600**	1.0236	-	26.00	**ZD26003032**	32	60	37	3D	81.0	172.2	TX2627P10
	Y261H2650	1.0433	-	26.50	**ZD26005032**				5D	135.0	225.2	
					ZD26008032				8D	216.0	304.	
	Y261H2700	1.0630	-	27.00	**ZD27003032**	32	60	37	3D	84.0	175.2	TX2728P10
	Y261H2750	1.0827	-	27.50	**ZD27005032**				5D	140.0	230.2	
	Y261H2778	1.0938	1-3/32	27.78	**ZD27008032**				8D	224.0	312.7	
S28 Ø28.00 to Ø29.99	**Y281H2800**	1.1024	-	28.00	**ZD28003032**	32	60	37	3D	87.0	179.2	TX2829P10
	Y281H2850	1.1220	-	28.50	**ZD28005032**				5D	145.0	236.2	
	Y281H2858	1.1250	1-1/8	28.58	**ZD28008032**				8D	232.0	321.7	
	Y281H2900	1.1417	-	29.00	**ZD29003032**	32	60	37	3D	90.0	183.2	TX2930P10
	Y281H2950	1.1614	-	29.50	**ZD29005032**				5D	150.0	242.2	
	Y281H2977	1.1719	1-11/64	29.77	**ZD29008032**				8D	240.0	330.7	

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Duplex	Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

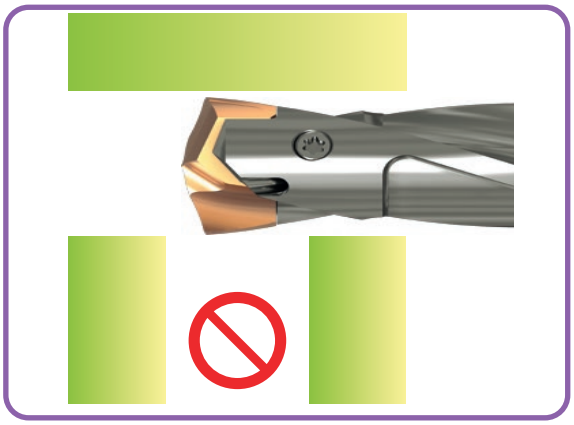
Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Cutting Speed	Feed					
			Vc	Ø10.0-11.99	Ø12.09-14.99	Ø15.00-17.99	Ø18.00-21.99	Ø22.0-26.9	Ø27.0-33.99
P	1	Non-alloy steel	80-135	0.13-0.29	0.18-0.33	0.23-0.37	0.28-0.43	0.34-0.50	0.36-0.52
	2		70-120	0.13-0.29	0.18-0.33	0.23-0.37	0.28-0.43	0.34-0.50	0.36-0.52
	3		70-95	0.13-0.29	0.18-0.33	0.23-0.37	0.28-0.43	0.34-0.50	0.36-0.52
	4		70-95	0.13-0.29	0.18-0.33	0.23-0.37	0.28-0.43	0.34-0.50	0.36-0.52
	5		40-80	0.13-0.29	0.18-0.33	0.23-0.37	0.28-0.43	0.34-0.50	0.36-0.52
	6	Low alloy steel	80-100	0.12-0.29	0.17-0.33	0.22-0.35	0.27-0.38	0.32-0.45	0.35-0.49
	7		70-90	0.12-0.29	0.17-0.33	0.22-0.35	0.27-0.38	0.32-0.45	0.35-0.49
	8		60-80	0.12-0.29	0.17-0.33	0.22-0.35	0.27-0.38	0.32-0.45	0.35-0.49
	9		50-60	0.12-0.29	0.17-0.33	0.22-0.35	0.27-0.38	0.32-0.45	0.35-0.49
	10	High alloyed steel, and tool steel	45-80	0.12-0.24	0.15-0.29	0.20-0.34	0.25-0.39	0.27-0.39	0.34-0.40
	11		35-70	0.12-0.24	0.15-0.29	0.20-0.34	0.25-0.39	0.27-0.39	0.34-0.40
K	15	Grey cast iron	100-140	0.15-0.35	0.20-0.40	0.25-0.45	0.30-0.55	0.35-0.60	0.40-0.60
	16		90-120	0.15-0.35	0.20-0.40	0.25-0.45	0.30-0.55	0.35-0.60	0.40-0.60
	17	Nodular cast iron	100-135	0.15-0.35	0.20-0.40	0.25-0.45	0.30-0.55	0.35-0.60	0.40-0.60
	18		90-120	0.15-0.35	0.20-0.40	0.25-0.45	0.30-0.55	0.35-0.60	0.40-0.60
	19	Malleable cast iron	100-135	0.15-0.35	0.20-0.40	0.25-0.45	0.30-0.55	0.35-0.60	0.40-0.60
	20		90-120	0.15-0.35	0.20-0.40	0.25-0.45	0.30-0.55	0.35-0.60	0.40-0.60

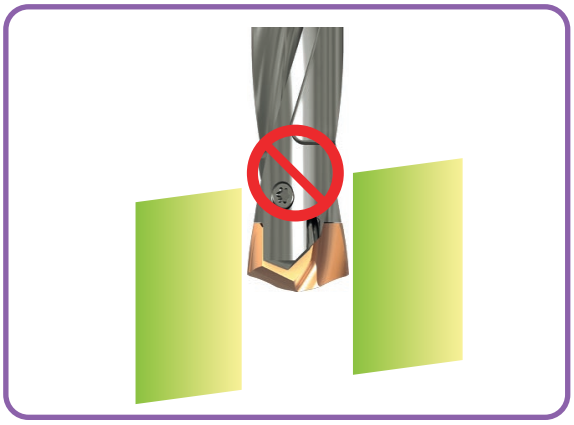
▶ The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
▶ Recommend you to reduce the feed rate to 85%, 70% when you use 5xD, 8xD holders.
▶ For use of 8xD holder, we recommend to use a pilot drill with equal to or larger than 140º point angle (0.5xD ~ 1.5xD).
The use of the centering pre-hole improves hole location, roundness and surface finish.

Comparison with Split Point Drill, Spade Drill & Dream Drill

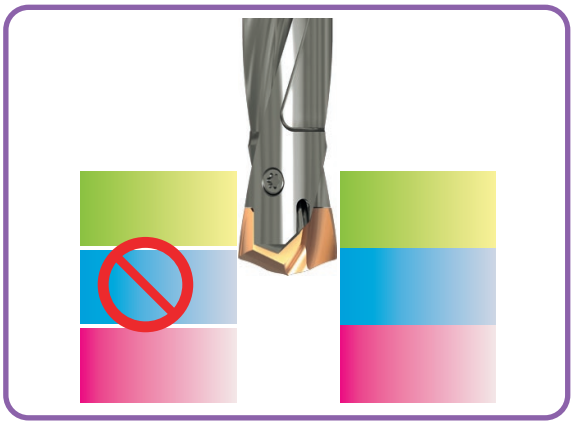
CAUTION-NOT RECOMMENDABLE APPLICATION
ACHTUNG - NICHT EMPFOHLENE ANWENDUNG



Intersecting cross hole is bigger than the drill insert's Margin Length.
Der Haltersitz ist größer als die Breite des Schneideinsatzes.

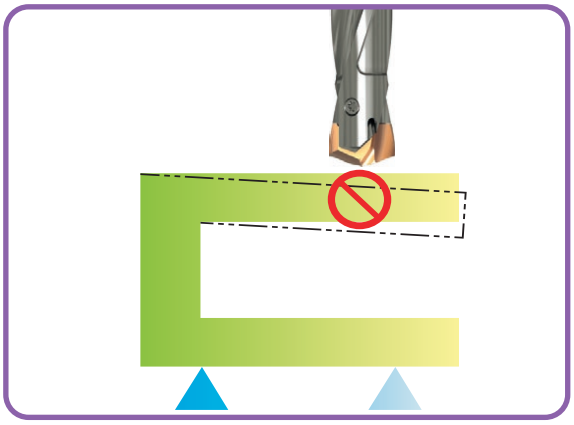


Material with slanting entrance and exit over 7 degrees. (If drilling 7 degrees or under slanting surface, reduce the feed about 30-50%)
Werkstücke mit schrägem Anschnitt oder Austritt von über 7°. (Zum Bohren von bis zu 7° Schräge den Vorschub um ca. 30-50% reduzieren).



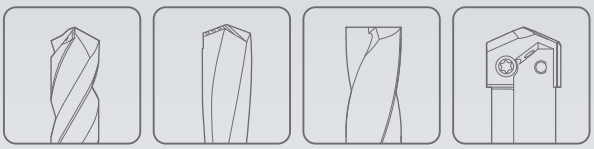
For drilling stacked plates, minimize the space between the plates.
Beim Bohren von Blechpaketen den Abstand der Bleche minimieren.

The space between stacked plates can cause insert breakage or poor chip control.
Freiraum in Blechpaketen kann den Bruch des Schneideinsatzes oder schlechte Entspanung verursachen.



The material needs to be fixtured securely before drilling.
Das Werkstück muss fest und sicher aufgespannt sein

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

CARBIDE INSERTS & HOLDERS

i-DREAM DRILLS

i-Dream Drills

- For General Steels and Stainless Steels
- Für allgemeine Stähle und Edelstähle

SELECTION GUIDE

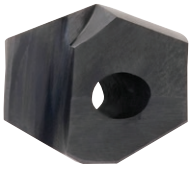
YG HOLEMAKING TOOLS

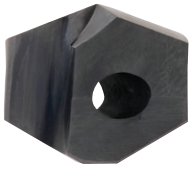
CARBIDE INSERTS & HOLDERS

i-DREAM DRILLS

For General Steels and Stainless Steels

SERIES	YA1A	YA2C	YB1A	YB2C
TYPE	A		B	
SIZE MIN	12.00		14.00	
SIZE MAX	13.89		15.87	
PAGE	A44		A45	
SURFACE TREATMENT	TiAlN	TiCN	TiAlN	TiCN





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◎ : Excellent ○ : Good

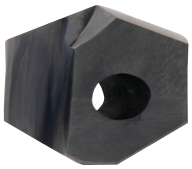
Recommended cutting conditions : p.A54

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	○	◎	○
	2		About 0.45% C	Annealed	190	13	◎	○	◎	○
	3		About 0.45% C	Quenched & Tempered	250	25	◎	○	◎	○
	4		About 0.75% C	Annealed	270	28	◎	○	◎	○
	5		About 0.75% C	Quenched & Tempered	300	32	◎		◎	
	6	Low alloy steel		Annealed	180	10	◎	○	◎	○
	7			Quenched & Tempered	275	29	◎	○	◎	○
	8			Quenched & Tempered	300	32	◎		◎	
	9			Quenched & Tempered	350	38	◎		◎	
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	○	◎	○
	11			Quenched & Tempered	325	35	◎		◎	
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		◎		◎
	13		Martensitic	Quenched & Tempered	240	23		◎		◎
	14		Austenitic		180	10		◎		◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎		◎	
	16		Pearlitic (Martensitic)		260	26	◎		◎	
	17	Nodular cast iron	Ferritic		160	3	◎		◎	
	18		Pearlitic		250	25	◎		◎	
	19	Malleable cast iron	Ferritic		130		◎		◎	
	20		Pearlitic		230	21	◎		◎	
N	21	Aluminum-wrought alloy	Not Curable		60			○		○
	22		Curable	Hardened	100			○		○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			○		○
	24		≤ 12% Si, Curable	Hardened	90			○		○
	25		> 12% Si, Not Curable		130			○		○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			○		○
	27		CuZn, CuSnZn (Brass)		90			○		○
	28		CuSn, lead-free copper and electrolytic copper		100			○		○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

SERIES	YH1A	YH2C
TYPE	H	
SIZE MIN	26.00	
SIZE MAX	27.78	
PAGE	A51	
SURFACE TREATMENT	TiAlN	TiCN

CARBIDE INSERTS & HOLDERS
i-DREAM DRILLS

For General Steels and Stainless Steels



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A54

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	○
	2		About 0.45% C	Annealed	190	13	◎	○
	3		About 0.45% C	Quenched & Tempered	250	25	◎	○
	4		About 0.75% C	Annealed	270	28	◎	○
	5		About 0.75% C	Quenched & Tempered	300	32	◎	
	6	Low alloy steel		Annealed	180	10	◎	○
	7			Quenched & Tempered	275	29	◎	○
	8			Quenched & Tempered	300	32	◎	
	9			Quenched & Tempered	350	38	◎	
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	○
	11			Quenched & Tempered	325	35	◎	
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		◎
	13		Martensitic	Quenched & Tempered	240	23		◎
	14		Austenitic		180	10		◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	
	16		Pearlitic (Martensitic)		260	26	◎	
	17	Nodular cast iron	Ferritic		160	3	◎	
	18		Pearlitic		250	25	◎	
	19	Malleable cast iron	Ferritic		130		◎	
	20		Pearlitic		230	21	◎	
N	21	Aluminum-wrought alloy	Not Curable		60			○
	22		Curable	Hardened	100			○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			○
	24		≤ 12% Si, Curable	Hardened	90			○
	25		> 12% Si, Not Curable		130			○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			○
	27		CuZn, CuSnZn (Brass)		90			○
	28		CuSn, lead-free copper and electrolytic copper		100			○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

i - DREAM DRILLS

YA1A SERIES
YA2C SERIES

i-DREAM DRILL INSERTS & HOLDERS

i-DREAM DRILL EINSÄTZE UND HALTER
PLAQUETTES ET PORTE-PLAQUETTE I-DREAM DRILL - USAGE GÉNÉRAL / INOX
INSERTI & PORTAINSERTI i-DREAM DRILL

- Features of *i-Dream Drill* Inserts-
Merkmale des i-Dream Drill Einsätze

▶ Secure and accurate seating resulting in accurate repeatability and concentricity.
Der sichere und genaue Sitz der Platte garantiert genaue Wiederholbarkeit beim Einsatz und beim Rundlauf.

i-Dream Drill ***General*** */ i-Dream Drill* ***allgemeinen***

▶ For most steels materials / In den meisten Stahlsorten

i-Dream Drill ***INOX*** */ i-Dream Drill* ***INOX***

▶ For tough, ductile materials and stainless steels
Für zähe, verformbare Werkstoffe und rostfreie Stähle.
▶ Light, sharp cutting edge / Scharfe Schneidkante
▶ Soft cutting action / Weicher Schnitt
▶ Minimize cutting forces / Minimaler Schneidendruck
▶ Reduce built-up edge / Reduzierte Gratbildung

- Features of *i-Dream Drill* Holders-
- Merkmale des i-Dresm Drill Halters-

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Speziell legierter Stahl, der seine Härte und Zähigkeit auch bei hohen Temperaturen behält.
▶ Innovative surface treatment improves wear resistance and reduces corrosion.
Innovative Oberflächenbehandlung, die die Verschleissfestigkeit erhöht und die Korrosion vermindert.
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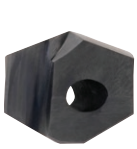
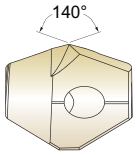

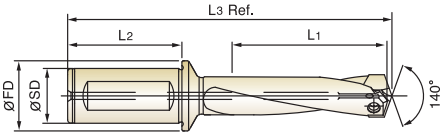

CARBIDE | ISO 9766 | h7 | 140° | TiAlN | TiCN

p.A54, A55

Unit : mm

Series Range	Insert EDP No.		Insert O.D.			Holder EDP No.	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth		Overall Length	Screw No.
(mm)	General (TiAlN)	INOX (TiCN)	h7 dec.	h7 frac.	h7 mm		SD	L2	FD	L1		L3 Ref.	
A Ø12.00 to Ø13.99	YA1A1200	YA2C1200	.4724	-	12.00	ZH12003020	20	50	25	3D	36	112.4	TX1213T08
	-	YA2C1210	.4764	-	12.10	ZH12005020				5D	60	136.4	
	YA1A1220	YA2C1220	.4803	-	12.20	ZH12007020				7D	84	160.4	
	YA1A1250	YA2C1250	.4921	-	12.50								
	YA1A1260	YA2C1260	.4961	-	12.60	ZH12503020	20	50	25	3D	37.5	113.4	
	YA1A1270	YA2C1270	.5000	1/2	12.70	ZH12505020				5D	62.5	138.4	
	YA1A1280	-	.5039	-	12.80	ZH12507020				7D	87.5	163.4	
	YA1A1290	-	.5079	-	12.90								
	YA1A1300	YA2C1300	.5118	-	13.00	ZH13003020	20	50	25	3D	39	115.4	TX1314T08
	YA1A1310	YA2C1310	.5156	33/64	13.10	ZH13005020				5D	65	141.4	
	YA1A1320	-	.5197	-	13.20	ZH13007020				7D	91	167.4	
	YA1A1349	YA2C1349	.5312	17/32	13.49								
	YA1A1350	YA2C1350	.5315	-	13.50								
	YA1A1370	-	.5394	-	13.70	ZH13503020	20	50	25	3D	40.5	116.4	
	YA1A1380	YA2C1380	.5433	-	13.80	ZH13507020				7D	94.5	170.4	
	YA1A1389	-	.5469	35/64	13.89								

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
YA1A	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎	◎	◎	◎
YA2C	○	○	○	○		○	○			○		◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
YA1A																					
YA2C	○	○	○	○	○	○	○	○													

i - DREAM DRILLS

YC1A SERIES
YC2C SERIES

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INSERTI & PORTAINSERTI i-DREAM DRILL

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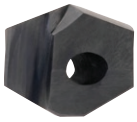
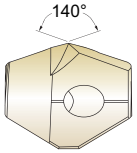

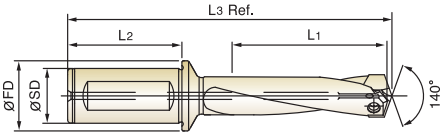

CARBIDE | ISO 9766 | h7 | 140° | TiAlN | TiCN

p.A54, A55

Unit : mm

Series Range (mm)	Insert EDP No. General (TiAlN)	Insert EDP No. INOX (TiCN)	Insert O.D. h7 dec.	Insert O.D. h7 frac.	Insert O.D. h7 mm	Holder EDP No.	Shank Dia. SD	Shank Length L2	Flange Dia. FD	Drilling Depth	L1	Overall Length L3 Ref.	Screw No.
C Ø16.00 to Ø17.99	YC1A1600	YC2C1600	.6299	-	16.00	ZH16003020	20	50	25	3D	48	125.0	TX1617T08
	YC1A1609	YC2C1609	.6335	-	16.09	ZH16005020				5D	80	157.0	
	YC1A1620	YC2C1620	.6378	-	16.20								
	YC1A1627	-	.6406	41/64	16.27								
	YC1A1630	YC2C1630	.6417	-	16.30								
	YC1A1650	YC2C1650	.6496	-	16.50	ZH16503020	20	50	25	3D	49.5	127.0	
	YC1A1667	YC2C1667	.6562	21/32	16.67	ZH16505020				5D	82.5	160.0	
	YC1A1680	-	.6614	-	16.80	ZH16507020				7D	115.5	193.0	
	YC1A1700	YC2C1700	.6693	-	17.00	ZH17003020	20	50	25	3D	51	128.0	TX1718T08
	YC1A1707	YC2C1707	.6719	43/64	17.07	ZH17005020				5D	85	162.0	
	YC1A1746	YC2C1746	.6875	11/16	17.46	ZH17007020				7D	119	196.0	
	YC1A1750	YC2C1750	.6890	-	17.50	ZH17503020	20	50	25	3D	52.5	130.0	
	YC1A1780	YC2C1780	.7008	-	17.80	ZH17505020				5D	87.5	165.0	
	YC1A1786	YC2C1786	.7031	45/64	17.86	ZH17507020				7D	122.5	200.0	

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
YC1A	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎	◎	◎	◎
YC2C	○	○	○	○		○	○			○		◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
YC1A																					
YC2C	○	○	○	○	○	○	○	○													

i - DREAM DRILLS

YE1A SERIES
YE2C SERIES

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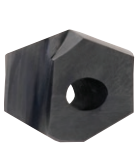

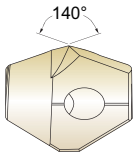

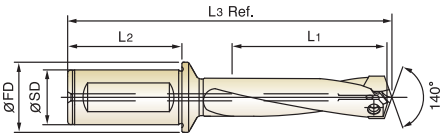

CARBIDE | ISO 9766 | h7 | 140° | TiAlN | TiCN

p.A54, A55

Unit : mm

Series Range	Insert EDP No.		Insert O.D.			Holder EDP No.	Shank Dia.	Shank Length	Flange Dia.	Drilling Depth		Overall Length	Screw No.
(mm)	General (TiAlN)	INOX (TiCN)	h7 dec.	h7 frac.	h7 mm		SD	L2	FD	L1		L3 Ref.	
E Ø20.00 to Ø21.99	YE1A2000		.7874	-	20.00	ZH20003025	25	56	32	3D	60	145.5	TX2021T20
	YE1A2024	YE2C2024	.7969	51/64	20.24	ZH20005025				5D	100	185.5	
						ZH20007025				7D	140	225.5	
	YE1A2050		.8071	-	20.50	ZH20503025	25	56	32	3D	61.5	147.5	
	YE1A2064	YE2C2064	.8125	13/16	20.64	ZH20505025				5D	102.5	188.5	
	YE1A2070		.8150	-	20.70	ZH20507025				7D	143.5	229.5	
	YE1A2100	YE2C2100	.8268	-	21.00	ZH21003025	25	56	32	3D	63	149.5	TX2122T20
	YE1A2150	YE2C2150	.8465	-	21.50	ZH21005025				5D	105	191.5	
	YE1A2170	YE2C2170	.8543	-	21.70	ZH21007025				7D	147	233.5	
	YE1A2183	YE2C2183	.8594	55/64	21.83	ZH21503025	25	56	32	3D	64.5	150.5	
						ZH21507025				7D	150.5	236.5	

▶ Other diameters of insert and shank types of holder are available upon request.

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ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
YE1A	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎	◎	◎	◎
YE2C	○	○	○	○		○	○			○		◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
YE1A																					
YE2C	○	○	○	○	○	○	○	○													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

i - DREAM DRILLS

YG1A SERIES
YG2C SERIES

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i-DREAM DRILL EINSÄTZE UND HALTER
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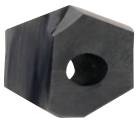
▶ For most steels materials / In den meisten Stahlsorten

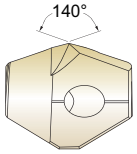
i-Dream Drill ***INOX*** */ i-Dream Drill* ***INOX***

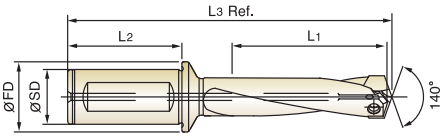
▶ For tough, ductile materials and stainless steels
Für zähe, verformbare Werkstoffe und rostfreie Stähle.
▶ Light, sharp cutting edge / Scharfe Schneidkante
▶ Soft cutting action / Weicher Schnitt
▶ Minimize cutting forces / Minimaler Schneidendruck
▶ Reduce built-up edge / Reduzierte Gratbildung

- Features of *i-Dream Drill* Holders-
- Merkmale des i-Dresm Drill Halters-

▶ Special Alloy Steels maintain its hardness and toughness under high temperatures.
Speziell legierter Stahl, der seine Härte und Zähigkeit auch bei hohen Temperaturen behält.
▶ Innovative surface treatment improves wear resistance and reduces corrosion.
Innovative Oberflächenbehandlung, die die Verschleissfestigkeit erhöht und die Korrosion vermindert.
▶ High Performance flute design allows maximum chip evacuation and minimum interference.
Optimierte Nutenform für maximale Spanabfuhr.







CARBIDE | ISO 9766 | h7 | 140° | TiAlN | TiCN

p.A54, A55

Unit : mm

Series Range (mm)	Insert EDP No. General (TiAlN)	Insert EDP No. INOX (TiCN)	Insert O.D. h7 dec.	Insert O.D. h7 frac.	Insert O.D. h7 mm	Holder EDP No.	Shank Dia. SD	Shank Length L2	Flange Dia. FD	Drilling Depth L1		Overall Length L3 Ref.	Screw No.
G Ø24.00 to Ø25.99	YG1A2400	YG2C2400	.9449	-	24.00	ZH24003032	32	60	37	3D	72	164.8	TX2425T20
		YG2C2421	.9531	61/64	24.21	ZH24005032				5D	120	212.8	
	YG1A2450	YG2C2450	.9646	-	24.50	ZH24503032	32	60	37	3D	73.5	165.8	
	YG1A2461		.9688	31/32	24.61	ZH24505032				5D	122.5	214.8	
	YG1A2470		.9724	-	24.70								
	YG1A2500	YG2C2500	.9843	63/64	25.00	ZH25003032	32	60	37	3D	75	167.8	TX2526T20
	YG1A2540	YG2C2540	1.0000	1	25.40	ZH25005032				5D	125	217.8	
						ZH25007032				7D	175	267.8	
	YG1A2550		1.0039	-	25.50	ZH25503032	32	60	37	3D	76.5	170.8	
	YG1A2567		1.0106	-	25.67	ZH25505032				5D	127.5	221.8	
	YG1A2570		1.0118	-	25.70	ZH25507032				7D	178.5	272.8	
	YG1A2580		1.0156	1-1/64	25.80								

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
YG1A	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎	◎	◎	◎
YG2C	○	○	○	○		○	○			○		◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
YG1A																					
YG2C	○	○	○	○	○	○	○	○													

i - DREAM DRILLS

YI1A SERIES
YI2C SERIES

i-DREAM DRILL INSERTS & HOLDERS

i-DREAM DRILL EINSÄTZE UND HALTER
PLAQUETTES ET PORTE-PLAQUETTE I-DREAM DRILL - USAGE GÉNÉRAL / INOX
INSERTI & PORTAINSERTI i-DREAM DRILL

- Features of *i-Dream Drill* Inserts-
Merkmale des i-Dream Drill Einsätze

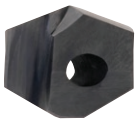
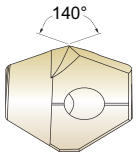
▶ Secure and accurate seating resulting in accurate repeatability and concentricity.
Der sichere und genaue Sitz der Platte garantiert genaue Wiederholbarkeit beim Einsatz und beim Rundlauf.

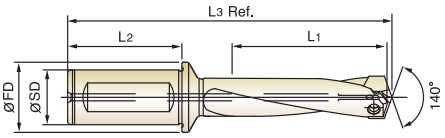
i-Dream Drill ***General*** */ i-Dream Drill* ***allgemeinen***
▶ For most steels materials / In den meisten Stahlsorten

i-Dream Drill ***INOX*** */ i-Dream Drill* ***INOX***
▶ For tough, ductile materials and stainless steels
Für zähe, verformbare Werkstoffe und rostfreie Stähle.
▶ Light, sharp cutting edge / Scharfe Schneidkante
▶ Soft cutting action / Weicher Schnitt
▶ Minimize cutting forces / Minimaler Schneidendruck
▶ Reduce built-up edge / Reduzierte Gratbildung

- Features of *i-Dream Drill* Holders-
- Merkmale des i-Dresm Drill Halters-

▶ Special Alloy Steels maintain its hardness and toughness under high temperatures.
Speziell legierter Stahl, der seine Härte und Zähigkeit auch bei hohen Temperaturen behält.
▶ Innovative surface treatment improves wear resistance and reduces corrosion.
Innovative Oberflächenbehandlung, die die Verschleissfestigkeit erhöht und die Korrosion vermindert.
▶ High Performance flute design allows maximum chip evacuation and minimum interference.
Optimierte Nutenform für maximale Spanabfuhr.



CARBIDE | ISO 9766 | h7 | 140° | TiAlN | TiCN

p.A54, A55

Unit : mm

Series Range (mm)	Insert EDP No. General (TiAlN)	Insert EDP No. INOX (TiCN)	Insert O.D. h7 dec.	Insert O.D. h7 frac.	Insert O.D. h7 mm	Holder EDP No.	Shank Dia. SD	Shank Length L2	Flange Dia. FD	Drilling Depth	L1	Overall Length L3 Ref.	Screw No.
I Ø28.00 to Ø29.99	YI1A2800	YI2C2800	1.1024	-	28.00	ZH28003032	32	60	37	3D	84	178.2	TX2829T25
	-	YI2C2850	1.1220	-	28.50	ZH28503032	32	60	37	3D	85.5	179.2	TX2829T25
						ZH28505032				5D	142.5	236.2	
						ZH28507032				7D	199.5	293.2	
	YI1A2900	YI2C2900	1.1417	-	29.00	ZH29003032	32	60	37	3D	87	182.2	TX2930T25
	YI1A2937	YI2C2937	1.1562	1-5/32	29.37	ZH29005032				5D	145	240.2	
						ZH29007032				7D	203	298.2	
	YI1A2950	YI2C2950	1.1614	-	29.50	ZH29503032	32	60	37	3D	88.5	183.2	
	YI1A2977		1.1719	1-11/64	29.77	ZH29507032				7D	206.5	301.2	

▶ Other diameters of insert and shank types of holder are available upon request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
YI1A	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎	◎	◎	◎
YI2C	○	○	○	○		○	○			○		◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
YI1A																					
YI2C	○	○	○	○	○	○	○	○													

i - DREAM DRILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

YA1A, YB1A, YC1A, YD1A, YE1A, YF1A, YG1A, YH1A, YI1A, YJ1A SERIES

i-DREAM DRILLS - GENERAL

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Feed				
				Ø12.00-14.99	Ø15.00-17.99	Ø18.00-21.99	Ø22.00-26.99	Ø27.00-31.99
P	1	Non-alloy steel	95-120	0.16-0.28	0.21-0.35	0.27-0.40	0.34-0.52	0.37-0.55
	2		80-105	0.14-0.24	0.21-0.35	0.27-0.40	0.34-0.52	0.37-0.55
	3		60-80	0.12-0.20	0.17-0.28	0.22-0.32	0.30-0.46	0.33-0.49
	4		55-70	0.10-0.16	0.15-0.25	0.21-0.30	0.25-0.38	0.29-0.43
	5		55-70	0.10-0.16	0.15-0.25	0.21-0.30	0.25-0.38	0.29-0.43
	6	Low alloy steel	70-90	0.12-0.20	0.17-0.28	0.22-0.32	0.30-0.46	0.34-0.50
	7		60-80	0.12-0.20	0.15-0.25	0.22-0.32	0.30-0.46	0.34-0.50
	8		55-70	0.10-0.16	0.13-0.21	0.21-0.30	0.25-0.38	0.29-0.43
	9		45-60	0.08-0.12	0.13-0.21	0.21-0.30	0.25-0.38	0.29-0.43
	10	High alloyed steel, and tool steel	50-65	0.10-0.16	0.13-0.21	0.18-0.26	0.20-0.31	0.24-0.35
	11		40-55	0.10-0.16	0.11-0.18	0.21-0.30	0.20-0.31	0.24-0.35
K	15	Grey cast iron	100-125	0.15-0.26	0.20-0.37	0.27-0.42	0.36-0.51	0.40-0.55
	16		75-95	0.11-0.20	0.16-0.29	0.20-0.30	0.25-0.35	0.29-0.40
	17	Nodular cast iron	95-120	0.13-0.22	0.17-0.31	0.21-0.32	0.28-0.40	0.32-0.44
	18		75-95	0.11-0.20	0.14-0.26	0.19-0.29	0.25-0.35	0.29-0.40
	19	Malleable cast iron	100-125	0.13-0.22	0.17-0.31	0.21-0.32	0.28-0.40	0.32-0.44
	20		75-95	0.11-0.18	0.14-0.26	0.19-0.29	0.25-0.35	0.29-0.40

- The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
  Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
- Recommend you to reduce the feed rate to 85%, 70% when you use 5xD, 7xD holders.
- For use of 7xD holder, we recommend to use a pilot drill with equal to or larger than 140° point angle (0.5xD - 1.5xD).
  The use of the centering pre-hole improves hole location, roundness and surface finish.

Comparison with Split Point Drill, Spade Drill & Dream Drill

Normal Split Point Drill — Dream Drill

Spade Drill — i-Dream Drill

ASSEMBLY OF i-DREAM DRILLS
MONTAGE DES i-DREAM DRILLS

Make sure to clean the insert and insert seat.
Schneideinsatz und Haltersitz sorgfältig reinigen.

Slide the drill insert into the slot of the holder and press down the insert to touch the bottom of the slot.
Schneideinsatz in den Haltersitz einführen und den Schneideinsatz fest auf den Grund des Haltersitzes pressen.

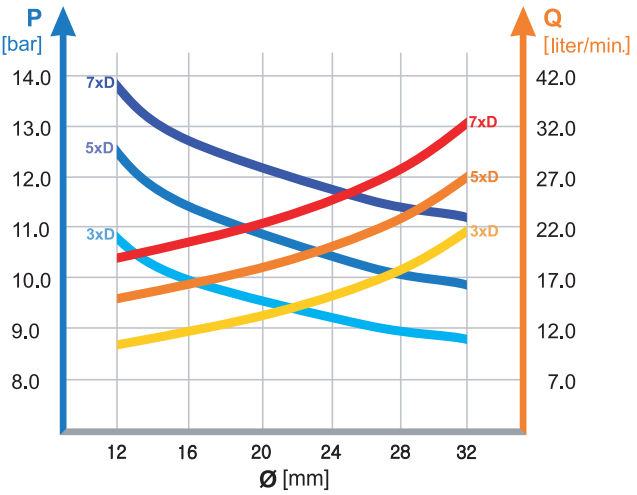
After confirming the insert is pressed down to the bottom of the slot, tighten the screw using anti-seize compound.
Wenn der Schneideinsatz fest auf den Grund des Haltersitzes gepresst ist, die Schraube fest anziehen und dabei Spezialfett verwenden.

WRENCH TYPE	PRODUCT No.	T-HANDLE No.	SERIES (SIZE)	CLAMPING TORQUE (N·m)
WING TYPE	TWWT08	—	A (Ø12.00-Ø13.99)	2.4
			B (Ø14.00-Ø15.99)	
			C (Ø16.00-Ø17.99)	
TORX BIT TYPE	TWBT15	TWH600	D (Ø18.00-Ø19.99)	6
	TWBT20		E, F, G (Ø20.00-Ø25.99)	10
	TWBT25		H, I, J (Ø26.00-Ø31.99)	13

Use the wing type or T-type wrench.
Benutzen Sie den Winkeldreher oder T - Schlüsse

- ▶ Need to use appropriate wrenches and screws as indicated.
  Unbedingt die angegebenen Schrauben und Dreher verwenden.
- ▶ It's important to tighten up the screw properly.
  Es ist wichtig, die Schraube korrekt und fest anzuziehen.

RECOMMENDED COOLANT PRESSURE AND FLOW RATE ON VERTICAL DRILLING
EMPFOHLENE KÜHLMITTELDRUCK UND - MENGE BEIM VERTIKALEN BOHREN



- Recommended emulsion mix is 6 - 8%.
  Empfohlene Emulsionsmischung 6 - 8%.
- For Drilling into Stainless and High Strength steels, a mix of 10% is recommended.
  Beim Bohren in rostfreie und hochfeste Stähle werden 10% empfohlen.
- For horizontal drilling, 30% reduction on the coolant pressure and flow rate is possible.
  Beim horizontalen Bohren können Kühlmitteldruck und - menge um 30% gemindert werden.
- Dry drilling is possible for 1-2xD drilling. (But not recommended.)
  Trocken Bohren ist möglich bei 1-2xD. (Aber nicht empfohlen.)

TROUBLE SHOOTING
PROBLEMLÖSUNGEN

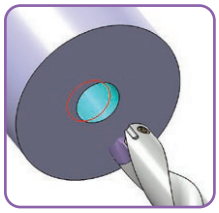
1) Heavy flank wear / Fast flank wear
- Reduce cutting speed
- Increase feed

2) Chipping on cutting edge
- Reduce feed
- Check the rigidity of spindle and chuck
- Rigid clamping of workpiece

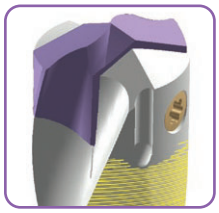
3) Build-up on cutting edge
- Increase cutting speed
- Use a coated insert

4) Chipping or break down on outer corner
- Reduce feed
- Rigid clamping of workpiece

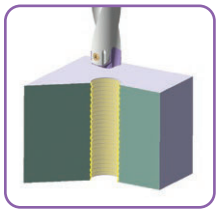
5) Wear of land margin
- Rigid clamping of workpiece
- Reduce cutting speed
- Increase coolant flow



6) Unsatisfactory positioning of the hole
- Rigid clamping of workpiece
- Reduce feed during entrance or exit



7) Scratching on holder
- Rigid clamping of workpiece
- Reduce feed
- Increase coolant flow



8) Unsatisfactory surface finish
- Rigid clamping of workpiece
- Increase coolant flow and pressure

Leading Through Innovation

SOLID CARBIDE

DREAM DRILLS -PRO

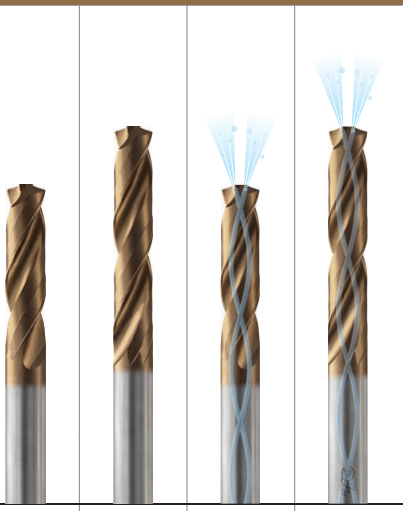
VHM DREAM DRILLS PRO BOHRER

- **For General Purpose (HRc30 to HRc50)**
- **Extremely High hardness and Heat resistance due to YG-1 special Z-Coating technology**

- Für allgemeine Zwecke (HRc30 bis HRc50)

- Extrem hohe Härte und Hitzebeständigkeit durch die spezielle Z-Beschichtungstechnologie von YG-1

SERIES	DGN523	DGN526	DGN506	DGN508
DRILLING DEPTH	3XD	5XD	3XD	5XD
LENGTH	SHORT	LONG	SHORT	LONG
SIZE MIN	D3.0	D1.0	D3.0	D1.2
SIZE MAX	D20.0	D19.5	D19.5	D20.0
PAGE	A62	A64	A68	A69
SURFACE TREATMENT	Z-Coating			



SOLID CARBIDE DREAM DRILLS PRO

For General Purpose (HRc30 to HRc50)
Extremely High hardness and Heat resistance due to YG-1 special Z-Coating technology

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A72

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DGN523	DGN526	DGN506	DGN508
P	1	Non-alloy steel	About 0.15% C	Annealed	125					
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	○	○	○	○
	9			Quenched & Tempered	350	38	○	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	○	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○	○	○
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○	○	○
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎
	18		Pearlitic		250	25	○	○	○	○
	19	Malleable cast iron	Ferritic		130		◎	◎	◎	◎
	20		Pearlitic		230	21	○	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55	○	○	○	○
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

DREAM DRILLS - PRO

DGN523 SERIES

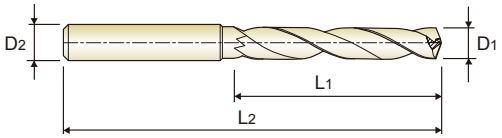
CARBIDE, DREAM DRILLS PRO

SHORT
KURZ
COURTE
CORTA

VHM DREAM DRILLS PRO BOHRER
FORETS DREAM DRILLS CARBURE MONOBLOC – PRO
MD, DREAM DRILLS PRO

- Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRc30-50), Cast Iron
- Wave shape cutting edge to improve chip formation for low cutting force
- Helical thinning for low thrust, stable torque and good chip breakage
- Extremely high hardness and heat resistance due to YG-1 special Z-Coating technology

- Bohren für Kohlenstoffstähle, legierte Stähle (HB225-325), vorvergütete Stähle (HRc30-50), Gusseisen
- Wellenförmige Schneidkante zur Verbesserung der Spanbildung und für geringe Schnittkräfte
- Spiralförmige Ausspitzung für geringe Axialkräfte, niedrige Schnittmomente und verbesserten Spanbruch
- Extrem hohe Härte und Hitzebeständigkeit durch die spezielle Z-Beschichtungstechnologie von YG-1



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | Z Coating

p.A72

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D1	D2	L1	L2
DGN523083	8.3	10	47	89
DGN523086	8.6	10	47	89
DGN523087	8.7	10	47	89
DGN523088	8.8	10	47	89
DGN523089	8.9	10	47	89
DGN523090	9.0	10	47	89
DGN523091	9.1	10	47	89
DGN523092	9.2	10	47	89
DGN523093	9.3	10	47	89
DGN523094	9.4	10	47	89
DGN523095	9.5	10	47	89
DGN523096	9.6	10	47	89
DGN523097	9.7	10	47	89
DGN523098	9.8	10	47	89
DGN523099	9.9	10	47	89
DGN523100	10.0	10	47	89
DGN523101	10.1	12	55	102
DGN523102	10.2	12	55	102
DGN523103	10.3	12	55	102
DGN523104	10.4	12	55	102
DGN523105	10.5	12	55	102
DGN523106	10.6	12	55	102
DGN523107	10.7	12	55	102
DGN523108	10.8	12	55	102

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D1	D2	L1	L2
DGN523109	10.9	12	55	102
DGN523110	11.0	12	55	102
DGN523112	11.2	12	55	102
DGN523113	11.3	12	55	102
DGN523114	11.4	12	55	102
DGN523115	11.5	12	55	102
DGN523116	11.6	12	55	102
DGN523117	11.7	12	55	102
DGN523118	11.8	12	55	102
DGN523119	11.9	12	55	102
DGN523120	12.0	12	55	102
DGN523123	12.3	14	60	107
DGN523125	12.5	14	60	107
DGN523128	12.8	14	60	107
DGN523130	13.0	14	60	107
DGN523135	13.5	14	60	107
DGN523138	13.8	14	60	107
DGN523140	14.0	14	60	107
DGN523145	14.5	16	65	115
DGN523148	14.8	16	65	115
DGN523150	15.0	16	65	115
DGN523155	15.5	16	65	115
DGN523160	16.0	16	65	115
DGN523165	16.5	18	73	123

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○			

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DREAM DRILLS - PRO

DGN526 SERIES

CARBIDE, DREAM DRILLS PRO

LONG
LANG
LONGUE
LUNGA

VHM DREAM DRILLS PRO BOHRER
FORETS DREAM DRILLS CARBURE MONOBLOC – PRO
MD, DREAM DRILLS PRO

- Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRc30-50), Cast Iron
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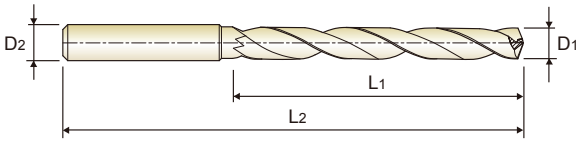

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | Z Coating

p.A72

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D1	D2	L1	L2
DGN526010	1.0	3	8	55
DGN526011	1.1	3	12	55
DGN526012	1.2	3	12	55
DGN526013	1.3	3	12	55
DGN526014	1.4	3	12	55
DGN526015	1.5	3	16	55
DGN526016	1.6	3	16	55
DGN526017	1.7	3	16	55
DGN526018	1.8	3	16	55
DGN526019	1.9	3	16	55
DGN526020	2.0	4	21	57
DGN526021	2.1	4	21	57
DGN526022	2.2	4	21	57
DGN526023	2.3	4	21	57
DGN526024	2.4	4	21	57
DGN526025	2.5	4	21	57
DGN526026	2.6	4	21	57
DGN526027	2.7	4	21	57
DGN526028	2.8	4	21	57
DGN526029	2.9	4	21	57
DGN526030	3.0	6	28	66
DGN526031	3.1	6	28	66
DGN526032	3.2	6	28	66
DGN526033	3.3	6	28	66

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D1	D2	L1	L2
DGN526034	3.4	6	28	66
DGN526035	3.5	6	28	66
DGN526036	3.6	6	28	66
DGN526037	3.7	6	28	66
DGN526038	3.8	6	36	74
DGN526039	3.9	6	36	74
DGN526040	4.0	6	36	74
DGN526041	4.1	6	36	74
DGN526042	4.2	6	36	74
DGN526043	4.3	6	36	74
DGN526044	4.4	6	36	74
DGN526045	4.5	6	36	74
DGN526046	4.6	6	36	74
DGN526048	4.8	6	44	82
DGN526049	4.9	6	44	82
DGN526050	5.0	6	44	82
DGN526051	5.1	6	44	82
DGN526052	5.2	6	44	82
DGN526053	5.3	6	44	82
DGN526054	5.4	6	44	82
DGN526055	5.5	6	44	82
DGN526056	5.6	6	44	82
DGN526057	5.7	6	44	82
DGN526058	5.8	6	44	82

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○			

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DREAM DRILLS - PRO

DGN526 SERIES

CARBIDE, DREAM DRILLS PRO

LONG
LANG
LONGUE
LUNGA

VHM DREAM DRILLS PRO BOHRER
FORETS DREAM DRILLS CARBURE MONOBLOC – PRO
MD, DREAM DRILLS PRO

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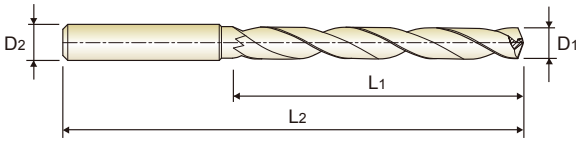
- Extrem hohe Härte und Hitzebeständigkeit durch die spezielle Z-Beschichtungstechnologie von YG-1



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | Z Coating

p.A72

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D1	D2	L1	L2
DGN526110	11.0	12	71	118
DGN526111	11.1	12	71	118
DGN526114	11.4	12	71	118
DGN526115	11.5	12	71	118
DGN526117	11.7	12	71	118
DGN526118	11.8	12	71	118
DGN526120	12.0	12	71	118
DGN526122	12.2	14	77	124
DGN526125	12.5	14	77	124
DGN526128	12.8	14	77	124
DGN526130	13.0	14	77	124
DGN526135	13.5	14	77	124
DGN526138	13.8	14	77	124
DGN526140	14.0	14	77	124
DGN526145	14.5	16	83	133

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D1	D2	L1	L2
DGN526148	14.8	16	83	133
DGN526150	15.0	16	83	133
DGN526155	15.5	16	83	133
DGN526158	15.8	16	83	133
DGN526160	16.0	16	83	133
DGN526170	17.0	18	93	143
DGN526175	17.5	18	93	143
DGN526180	18.0	18	93	143
DGN526185	18.5	20	101	153
DGN526190	19.0	20	101	153
DGN526195	19.5	20	101	153

- Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○			

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YG-1 CO., LTD.

DREAM DRILLS - PRO

DGN506 SERIES

CARBIDE, DREAM DRILLS PRO WITH COOLANT HOLES

SHORT
KURZ
COURTE
CORTA

VHM DREAM DRILLS PRO BOHRER MIT INNENKÜHLUNG
FORETS DREAM DRILLS CARBURE MONOBLOC – PRO, AVEC ARROSAGE CENTRAL
MD, DREAM DRILL PRO CON FORI DI REFRIGERAZIONE

- Drilling for Carbon Steels, Alloy Steels (HB225-325), Pre-hardened Steels (HRc30-50), Cast Iron
- Wave shape cutting edge to improve chip formation for low cutting force
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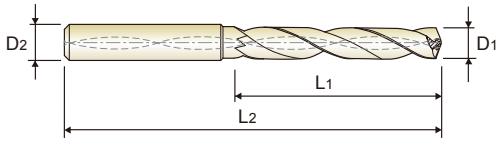
- Extrem hohe Härte und Hitzebeständigkeit durch die spezielle Z-Beschichtungstechnologie von YG-1



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | Z Coating

p.A73

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D_1	D_2	L_1	L_2
DGN506084	8.4	10	47	89
DGN506085	8.5	10	47	89
DGN506086	8.6	10	47	89
DGN506087	8.7	10	47	89
DGN506088	8.8	10	47	89
DGN506089	8.9	10	47	89
DGN506090	9.0	10	47	89
DGN506091	9.1	10	47	89
DGN506092	9.2	10	47	89
DGN506093	9.3	10	47	89
DGN506094	9.4	10	47	89
DGN506095	9.5	10	47	89
DGN506096	9.6	10	47	89
DGN506098	9.8	10	47	89
DGN506099	9.9	10	47	89
DGN506100	10.0	10	47	89
DGN506102	10.2	12	55	102
DGN506103	10.3	12	55	102
DGN506104	10.4	12	55	102
DGN506105	10.5	12	55	102
DGN506106	10.6	12	55	102
DGN506107	10.7	12	55	102
DGN506108	10.8	12	55	102
DGN506109	10.9	12	55	102

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D_1	D_2	L_1	L_2
DGN506110	11.0	12	55	102
DGN506111	11.1	12	55	102
DGN506112	11.2	12	55	102
DGN506113	11.3	12	55	102
DGN506114	11.4	12	55	102
DGN506116	11.6	12	55	102
DGN506117	11.7	12	55	102
DGN506118	11.8	12	55	102
DGN506119	11.9	12	55	102
DGN506120	12.0	12	55	102
DGN506125	12.5	14	60	107
DGN506130	13.0	14	60	107
DGN506135	13.5	14	60	107
DGN506140	14.0	14	60	107
DGN506145	14.5	16	65	115
DGN506150	15.0	16	65	115
DGN506160	16.0	16	65	115
DGN506165	16.5	18	73	123
DGN506170	17.0	18	73	123
DGN506175	17.5	18	73	123
DGN506180	18.0	18	73	123
DGN506185	18.5	20	79	131
DGN506195	19.5	20	79	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○			

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DREAM DRILLS - PRO

DGN508 SERIES

CARBIDE, DREAM DRILLS PRO WITH COOLANT HOLES

LONG
LANG
LONGUE
LUNGA

VHM DREAM DRILLS PRO BOHRER MIT INNENKÜHLUNG
FORETS DREAM DRILLS CARBURE MONOBLOC – PRO, AVEC ARROSAGE CENTRAL
MD, DREAM DRILL PRO CON FORI DI REFRIGERAZIONE

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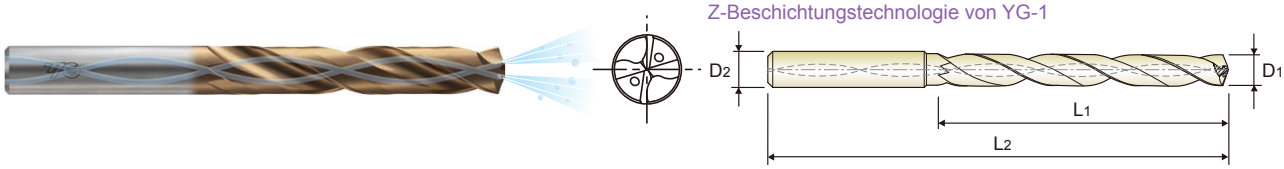

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | Z Coating

p.A73

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D1	D2	L1	L2
DGN508061	6.1	8	53	91
DGN508062	6.2	8	53	91
DGN508063	6.3	8	53	91
DGN508064	6.4	8	53	91
DGN508066	6.6	8	53	91
DGN508067	6.7	8	53	91
DGN508068	6.8	8	53	91
DGN508069	6.9	8	53	91
DGN508070	7.0	8	53	91
DGN508071	7.1	8	53	91
DGN508073	7.3	8	53	91
DGN508074	7.4	8	53	91
DGN508075	7.5	8	53	91
DGN508076	7.6	8	53	91
DGN508078	7.8	8	53	91
DGN508079	7.9	8	53	91
DGN508080	8.0	8	53	91
DGN508081	8.1	10	61	103
DGN508082	8.2	10	61	103
DGN508083	8.3	10	61	103
DGN508084	8.4	10	61	103
DGN508085	8.5	10	61	103
DGN508086	8.6	10	61	103
DGN508087	8.7	10	61	103

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
Z-Coating	D1	D2	L1	L2
DGN508088	8.8	10	61	103
DGN508089	8.9	10	61	103
DGN508090	9.0	10	61	103
DGN508091	9.1	10	61	103
DGN508092	9.2	10	61	103
DGN508093	9.3	10	61	103
DGN508094	9.4	10	61	103
DGN508095	9.5	10	61	103
DGN508096	9.6	10	61	103
DGN508097	9.7	10	61	103
DGN508098	9.8	10	61	103
DGN508099	9.9	10	61	103
DGN508100	10.0	10	61	103
DGN508101	10.1	12	71	118
DGN508102	10.2	12	71	118
DGN508103	10.3	12	71	118
DGN508104	10.4	12	71	118
DGN508105	10.5	12	71	118
DGN508107	10.7	12	71	118
DGN508108	10.8	12	71	118
DGN508109	10.9	12	71	118
DGN508110	11.0	12	71	118
DGN508111	11.1	12	71	118
DGN508113	11.3	12	71	118

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○			

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YG-1 CO., LTD.

DREAM DRILLS - PRO

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

DGN523, DGN526 SERIES without COOLANT HOLES

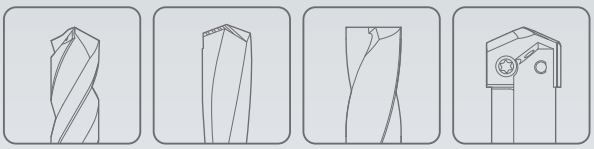
Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 1.0	2.0	Vc	Parameter	Drill Diameter (mm) 3.0	4.0	5.0	6.0
P	2	Non-alloy steel	85	RPM	27,060	13,530	120	RPM	12,730	9,550	7,640	6,370
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	3		85	RPM	27,060	13,530	120	RPM	12,730	9,550	7,640	6,370
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	4		85	RPM	27,060	13,530	120	RPM	12,730	9,550	7,640	6,370
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
	5		75	RPM	23,870	11,940	95	RPM	10,080	7,560	6,050	5,040
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
	6	Low alloy steel	85	RPM	27,060	13,530	120	RPM	12,730	9,550	7,640	6,370
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	7		75	RPM	23,870	11,940	95	RPM	10,080	7,560	6,050	5,040
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	8		75	RPM	23,870	11,940	95	RPM	10,080	7,560	6,050	5,040
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
	9		36	RPM	11,460	5,730	50	RPM	5,310	3,980	3,180	2,650
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14	0.10-0.16
	10	High alloyed steel, and tool steel	60	RPM	19,100	9,550	80	RPM	8,490	6,370	5,090	4,240
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
	11		35	RPM	11,140	5,570	45	RPM	4,770	3,580	2,860	2,390
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14	0.10-0.16
M	12	Stainless steel	60	RPM	19,100	9,550	85	RPM	9,020	6,760	5,410	4,510
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	13		45	RPM	14,320	7,160	55	RPM	5,840	4,380	3,500	2,920
				FEED	0.02-0.04	0.03-0.05			0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
K	15	Grey cast iron	85	RPM	27,060	13,530	120	RPM	12,730	9,550	7,640	6,370
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
	16		80	RPM	25,460	12,730	95	RPM	10,080	7,560	6,050	5,040
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	17	Nodular cast iron	85	RPM	27,060	13,530	120	RPM	12,730	9,550	7,640	6,370
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
	18		60	RPM	19,100	9,550	85	RPM	9,020	6,760	5,410	4,510
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	19	Malleable cast iron	75	RPM	23,870	11,940	95	RPM	10,080	7,560	6,050	5,040
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
	20		60	RPM	19,100	9,550	85	RPM	9,020	6,760	5,410	4,510
				FEED	0.03-0.05	0.05-0.07			0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
H	38	Hardened steel	25	RPM	7,960	3,980	30	RPM	3,180	2,390	1,910	1,590
				FEED	0.01-0.02	0.01-0.03			0.01-0.03	0.01-0.04	0.02-0.05	0.03-0.06

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy steel	120	RPM	4,770	3,820	3,180	2,730	2,390	2,120	1,910
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	3		120	RPM	4,770	3,820	3,180	2,730	2,390	2,120	1,910
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	4		120	RPM	4,770	3,820	3,180	2,730	2,390	2,120	1,910
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	5		95	RPM	3,780	3,020	2,520	2,160	1,890	1,680	1,510
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	6	Low alloy steel	120	RPM	4,770	3,820	3,180	2,730	2,390	2,120	1,910
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	7		95	RPM	3,780	3,020	2,520	2,160	1,890	1,680	1,510
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	8		95	RPM	3,780	3,020	2,520	2,160	1,890	1,680	1,510
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	9		50	RPM	1,990	1,590	1,330	1,140	990	880	800
				FEED	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
	10	High alloyed steel, and tool steel	80	RPM	3,180	2,550	2,120	1,820	1,590	1,410	1,270
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	11		45	RPM	1,790	1,430	1,190	1,020	900	800	720
				FEED	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
M	12	Stainless steel	85	RPM	3,380	2,710	2,250	1,930	1,690	1,500	1,350
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	13		55	RPM	2,190	1,750	1,460	1,250	1,090	970	880
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
K	15	Grey cast iron	120	RPM	4,770	3,820	3,180	2,730	2,390	2,120	1,910
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	16		95	RPM	3,780	3,020	2,520	2,160	1,890	1,680	1,510
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	17	Nodular cast iron	120	RPM	4,770	3,820	3,180	2,730	2,390	2,120	1,910
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	18		85	RPM	3,380	2,710	2,250	1,930	1,690	1,500	1,350
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	19	Malleable cast iron	95	RPM	3,780	3,020	2,520	2,160	1,890	1,680	1,510
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	20		85	RPM	3,380	2,710	2,250	1,930	1,690	1,500	1,350
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
H	38	Hardened steel	30	RPM	1,190	950	800	680	600	530	480
				FEED	0.03-0.06	0.04-0.07	0.04-0.08	0.05-0.09	0.05-0.09	0.05-0.10	0.05-0.10

▶ Recommend to reduce the feed rate as following **Feed 100%** : DGN523(3×D), DGN526(5×D)

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

SOLID CARBIDE

DREAM DRILL X

- Multi-Purpose Solid Carbide Drilling up to HRc50
- Proprietary coating upgrade boosting performance in Steel and Cast-Iron applications
- Mehrzweck-Vollhartmetallbohrer bis HRc 50
- In-house Beschichtungsentwicklung zur Leistungssteigerung bei Stahl- und Gussanwendungen

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	DTX404	DTX423
DRILLING DEPTH	3XD	3XD
LENGTH	STUB	SHORT
SIZE MIN	D3.0	D3.0
SIZE MAX	D20.0	D20.0
PAGE	A78	A80
SURFACE TREATMENT	RCH-Coating	

SOLID CARBIDE

DREAM DRILL X

Multi-Purpose Solid Carbide Drilling up to HRc50

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◎ : Excellent ○ : Good

Recommended cutting conditions : p.A92

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DTX404	DTX423
P	1	Non-alloy steel	About 0.15% C	Annealed	125			
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29	◎	◎
	8			Quenched & Tempered	300	32	○	○
	9			Quenched & Tempered	350	38	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎
	11			Quenched & Tempered	325	35	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○
	17	Nodular cast iron	Ferritic		160	3	◎	◎
	18		Pearlitic		250	25	○	○
	19	Malleable cast iron	Ferritic		130		◎	◎
	20		Pearlitic		230	21	○	○
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55	○	○
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

DREAM DRILL X

DTX404 SERIES

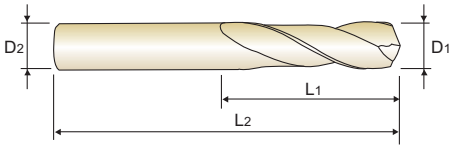
CARBIDE, DREAM DRILL X (3XD)

STUB
EXTRA KURZ
EXTRA-COURTE
EXTRA CORTA

VOLLHARTMETALL DREAM SPIRALBOHRER X
Forets DREAM DRILLS X carbure, série extra-courte
PUNTE ELICOIDALI IN MD - DREAM DRILLS X

- Upgraded coating for higher Tool Life in various materials
- Soft cutting action and reduced axial forces; Easy to Recondition
- Good self-centering even at low feed rates and unstable situations
- Excellent Chip breaking and chip evacuation

- Verbesserte Beschichtung für höhere Standzeit in verschiedenen Materialien
- Weicher Schnitt und reduzierte Axialkräfte; leicht nachzuschleifen
- Sehr gute Selbstzentrierung auch bei niedrigen Vorschubgeschwindigkeiten und labilen Verhältnissen
- Hervorragender Spanbruch und Spanabfuhr



DIN 6539 | CARBIDE | 30° | h6 | h7 | 140° | RCH Coating

p.A92

$D_1=D_2$

3 × D

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
RCH-Coating	D1=D2	L1	L2
DTX404030	3.0	16	46
DTX404031	3.1	18	49
DTX404032	3.2	18	49
DTX404033	3.3	18	49
DTX404034	3.4	20	52
DTX404035	3.5	20	52
DTX404036	3.6	20	52
DTX404037	3.7	20	52
DTX404038	3.8	22	55
DTX404039	3.9	22	55
DTX404040	4.0	22	55
DTX404041	4.1	22	55
DTX404042	4.2	22	55
DTX404043	4.3	24	58
DTX404044	4.4	24	58
DTX404045	4.5	24	58
DTX404046	4.6	24	58
DTX404047	4.7	24	58
DTX404048	4.8	26	62
DTX404049	4.9	26	62
DTX404050	5.0	26	62
DTX404051	5.1	26	62
DTX404052	5.2	26	62
DTX404053	5.3	26	62
DTX404054	5.4	28	66
DTX404055	5.5	28	66
DTX404056	5.6	28	66
DTX404057	5.7	28	66

EDP No.	Drill Diameter	Flute Length	Overall Length
RCH-Coating	D1=D2	L1	L2
DTX404058	5.8	28	66
DTX404059	5.9	28	66
DTX404060	6.0	28	66
DTX404061	6.1	31	70
DTX404062	6.2	31	70
DTX404063	6.3	31	70
DTX404064	6.4	31	70
DTX404065	6.5	31	70
DTX404066	6.6	31	70
DTX404067	6.7	31	70
DTX404068	6.8	34	74
DTX404069	6.9	34	74
DTX404070	7.0	34	74
DTX404071	7.1	34	74
DTX404072	7.2	34	74
DTX404073	7.3	34	74
DTX404074	7.4	34	74
DTX404075	7.5	34	74
DTX404076	7.6	37	79
DTX404077	7.7	37	79
DTX404078	7.8	37	79
DTX404079	7.9	37	79
DTX404080	8.0	37	79
DTX404081	8.1	37	79
DTX404082	8.2	37	79
DTX404083	8.3	37	79
DTX404084	8.4	37	79
DTX404085	8.5	37	79

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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YG-1 CO., LTD.

DREAM DRILL X

DTX423 SERIES

CARBIDE, DREAM DRILL X (3XD)

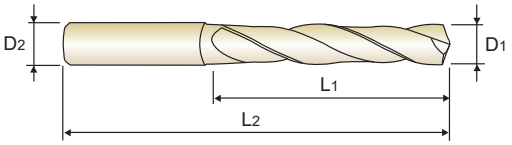
SHORT

VOLLHARTMETALL DREAM SPIRALBOHRER X
Forets DREAM DRILLS X carbure, série extra-courte
PUNTE ELICOIDALI IN MD - DREAM DRILLS X

KURZ
COURTE
CORTA

- Upgraded coating for higher Tool Life in various materials
- Soft cutting action and reduced axial forces; Easy to Recondition
- Good self-centering even at low feed rates and unstable situations
- Excellent Chip breaking and chip evacuation

- Verbesserte Beschichtung für höhere Standzeit in verschiedenen Materialien
- Weicher Schnitt und reduzierte Axialkräfte; leicht nachzuschleifen
- Sehr gute Selbstzentrierung auch bei niedrigen Vorschubgeschwindigkeiten und labilen Verhältnissen
- Hervorragender Spanbruch und Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | RCH Coating

p.A92

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D_1	D_2	L_1	L_2
DTX423030	3.0	6	20	62
DTX423031	3.1	6	20	62
DTX423032	3.2	6	20	62
DTX423033	3.3	6	20	62
DTX423034	3.4	6	20	62
DTX423035	3.5	6	20	62
DTX423036	3.6	6	20	62
DTX423037	3.7	6	20	62
DTX423038	3.8	6	24	66
DTX423039	3.9	6	24	66
DTX423040	4.0	6	24	66
DTX423041	4.1	6	24	66
DTX423042	4.2	6	24	66
DTX423043	4.3	6	24	66
DTX423044	4.4	6	24	66
DTX423045	4.5	6	24	66
DTX423046	4.6	6	24	66
DTX423047	4.7	6	24	66
DTX423048	4.8	6	28	66
DTX423049	4.9	6	28	66
DTX423050	5.0	6	28	66
DTX423051	5.1	6	28	66
DTX423052	5.2	6	28	66
DTX423053	5.3	6	28	66
DTX423054	5.4	6	28	66
DTX423055	5.5	6	28	66
DTX423056	5.6	6	28	66
DTX423057	5.7	6	28	66
DTX423058	5.8	6	28	66
DTX423059	5.9	6	28	66

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D_1	D_2	L_1	L_2
DTX423060	6.0	6	28	66
DTX423061	6.1	8	34	79
DTX423062	6.2	8	34	79
DTX423063	6.3	8	34	79
DTX423064	6.4	8	34	79
DTX423065	6.5	8	34	79
DTX423066	6.6	8	34	79
DTX423067	6.7	8	34	79
DTX423068	6.8	8	34	79
DTX423069	6.9	8	34	79
DTX423070	7.0	8	34	79
DTX423071	7.1	8	41	79
DTX423072	7.2	8	41	79
DTX423073	7.3	8	41	79
DTX423074	7.4	8	41	79
DTX423075	7.5	8	41	79
DTX423076	7.6	8	41	79
DTX423077	7.7	8	41	79
DTX423078	7.8	8	41	79
DTX423079	7.9	8	41	79
DTX423080	8.0	8	41	79
DTX423081	8.1	10	47	89
DTX423082	8.2	10	47	89
DTX423083	8.3	10	47	89
DTX423084	8.4	10	47	89
DTX423085	8.5	10	47	89
DTX423086	8.6	10	47	89
DTX423087	8.7	10	47	89
DTX423088	8.8	10	47	89
DTX423089	8.9	10	47	89

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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YG-1 CO., LTD.

DREAM DRILL X

DTX424 SERIES

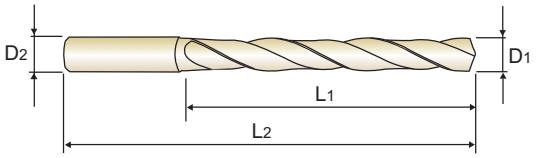
CARBIDE, DREAM DRILL X (5XD)

LONG
LANG
LONGUE
LUNGA

VOLLHARTMETALL DREAM SPIRALBOHRER X
Forets DREAM DRILLS X carbure, série extra-courte
PUNTE ELICOIDALI IN MD - DREAM DRILLS X

- Upgraded coating for higher Tool Life in various materials
- Soft cutting action and reduced axial forces; Easy to Recondition
- Good self-centering even at low feed rates and unstable situations
- Excellent Chip breaking and chip evacuation

- Verbesserte Beschichtung für höhere Standzeit in verschiedenen Materialien
- Weicher Schnitt und reduzierte Axialkräfte; leicht nachzuschleifen
- Sehr gute Selbstzentrierung auch bei niedrigen Vorschubgeschwindigkeiten und labilen Verhältnissen
- Hervorragender Spanbruch und Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | RCH Coating

p.A92

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D1	D2	L1	L2
DTX424010	1.0	3	8	55
DTX424011	1.1	3	12	55
DTX424012	1.2	3	12	55
DTX424013	1.3	3	12	55
DTX424014	1.4	3	12	55
DTX424015	1.5	3	16	55
DTX424016	1.6	3	16	55
DTX424017	1.7	3	16	55
DTX424018	1.8	3	16	55
DTX424019	1.9	3	16	55
DTX424020	2.0	4	21	57
DTX424021	2.1	4	21	57
DTX424022	2.2	4	21	57
DTX424023	2.3	4	21	57
DTX424024	2.4	4	21	57
DTX424025	2.5	4	21	57
DTX424026	2.6	4	21	57
DTX424027	2.7	4	21	57
DTX424028	2.8	4	21	57
DTX424029	2.9	4	21	57
DTX424030	3.0	6	28	66
DTX424031	3.1	6	28	66
DTX424032	3.2	6	28	66
DTX424033	3.3	6	28	66
DTX424034	3.4	6	28	66
DTX424035	3.5	6	28	66
DTX424036	3.6	6	28	66
DTX424037	3.7	6	28	66

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D1	D2	L1	L2
DTX424038	3.8	6	36	74
DTX424039	3.9	6	36	74
DTX424040	4.0	6	36	74
DTX424041	4.1	6	36	74
DTX424042	4.2	6	36	74
DTX424043	4.3	6	36	74
DTX424044	4.4	6	36	74
DTX424045	4.5	6	36	74
DTX424046	4.6	6	36	74
DTX424047	4.7	6	36	74
DTX424048	4.8	6	44	82
DTX424049	4.9	6	44	82
DTX424050	5.0	6	44	82
DTX424051	5.1	6	44	82
DTX424052	5.2	6	44	82
DTX424053	5.3	6	44	82
DTX424054	5.4	6	44	82
DTX424055	5.5	6	44	82
DTX424056	5.6	6	44	82
DTX424057	5.7	6	44	82
DTX424058	5.8	6	44	82
DTX424059	5.9	6	44	82
DTX424060	6.0	6	44	82
DTX424061	6.1	8	53	91
DTX424062	6.2	8	53	91
DTX424063	6.3	8	53	91
DTX424064	6.4	8	53	91
DTX424065	6.5	8	53	91

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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YG-1 CO., LTD.

DREAM DRILL X

DTX424 SERIES

CARBIDE, DREAM DRILL X (5XD)

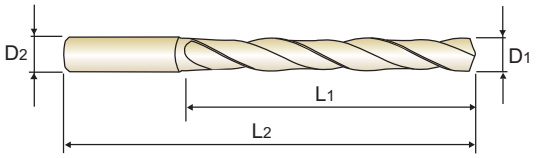
LONG

VOLLHARTMETALL DREAM SPIRALBOHRER X
Forets DREAM DRILLS X carbure, série extra-courte
PUNTE ELICOIDALI IN MD - DREAM DRILLS X

LANG
LONGUE
LUNGA

- Upgraded coating for higher Tool Life in various materials
- Soft cutting action and reduced axial forces; Easy to Recondition
- Good self-centering even at low feed rates and unstable situations
- Excellent Chip breaking and chip evacuation

- Verbesserte Beschichtung für höhere Standzeit in verschiedenen Materialien
- Weicher Schnitt und reduzierte Axialkräfte; leicht nachzuschleifen
- Sehr gute Selbstzentrierung auch bei niedrigen Vorschubgeschwindigkeiten und labilen Verhältnissen
- Hervorragender Spanbruch und Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | RCH Coating

p.A92

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D_1	D_2	L_1	L_2
DTX424130	**13.0**	14	77	124
DTX424135	**13.5**	14	77	124
DTX424140	**14.0**	14	77	124
DTX424145	**14.5**	16	83	133
DTX424150	**15.0**	16	83	133
DTX424155	**15.5**	16	83	133
DTX424160	**16.0**	16	83	133
DTX424165	**16.5**	18	93	143

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D_1	D_2	L_1	L_2
DTX424170	**17.0**	18	93	143
DTX424175	**17.5**	18	93	143
DTX424180	**18.0**	18	93	143
DTX424185	**18.5**	20	101	153
DTX424190	**19.0**	20	101	153
DTX424195	**19.5**	20	101	153
DTX424200	**20.0**	20	101	153

- Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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YG-1 CO., LTD.

DREAM DRILL X

DTX406 SERIES

CARBIDE, DREAM DRILL X with COOLANT HOLES (3XD)

SHORT

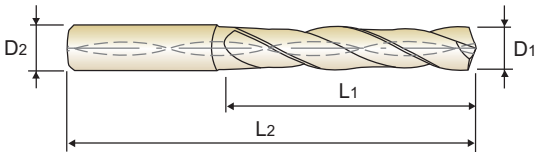
VOLLHARTMETALL DREAM SPIRALBOHRER mit KÜHLKANAL *KURZ*

Forets DREAM DRILLS carbure, avec arrosage central, série courte *COURTE*

PUNTE ELICOIDALI IN MD - DREAM DRILLS (con fori di refrigerazione) *CORTA*

- Upgraded coating for higher Tool Life in various materials
- Soft cutting action and reduced axial forces; Easy to Recondition
- Good self-centering even at low feed rates and unstable situations
- Excellent Chip breaking and chip evacuation

- Verbesserte Beschichtung für höhere Standzeit in verschiedenen Materialien
- Weicher Schnitt und reduzierte Axialkräfte; leicht nachzuschleifen
- Sehr gute Selbstzentrierung auch bei niedrigen Vorschubgeschwindigkeiten und labilen Verhältnissen
- Hervorragender Spanbruch und Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | RCH Coating

p.A93

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D_1	D_2	L_1	L_2
DTX406086	8.6	10	47	89
DTX406087	8.7	10	47	89
DTX406088	8.8	10	47	89
DTX406089	8.9	10	47	89
DTX406090	9.0	10	47	89
DTX406091	9.1	10	47	89
DTX406092	9.2	10	47	89
DTX406093	9.3	10	47	89
DTX406094	9.4	10	47	89
DTX406095	9.5	10	47	89
DTX406096	9.6	10	47	89
DTX406097	9.7	10	47	89
DTX406098	9.8	10	47	89
DTX406099	9.9	10	47	89
DTX406100	10.0	10	47	89
DTX406101	10.1	12	55	102
DTX406102	10.2	12	55	102
DTX406103	10.3	12	55	102
DTX406104	10.4	12	55	102
DTX406105	10.5	12	55	102
DTX406106	10.6	12	55	102
DTX406107	10.7	12	55	102
DTX406108	10.8	12	55	102
DTX406109	10.9	12	55	102
DTX406110	11.0	12	55	102
DTX406111	11.1	12	55	102
DTX406112	11.2	12	55	102
DTX406113	11.3	12	55	102

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D_1	D_2	L_1	L_2
DTX406114	11.4	12	55	102
DTX406115	11.5	12	55	102
DTX406116	11.6	12	55	102
DTX406117	11.7	12	55	102
DTX406118	11.8	12	55	102
DTX406119	11.9	12	55	102
DTX406120	12.0	12	55	102
DTX406125	12.5	14	60	107
DTX406130	13.0	14	60	107
DTX406135	13.5	14	60	107
DTX406140	14.0	14	60	107
DTX406145	14.5	16	65	115
DTX406150	15.0	16	65	115
DTX406155	15.5	16	65	115
DTX406160	16.0	16	65	115
DTX406165	16.5	18	73	123
DTX406170	17.0	18	73	123
DTX406175	17.5	18	73	123
DTX406180	18.0	18	73	123
DTX406185	18.5	20	79	131
DTX406190	19.0	20	79	131
DTX406195	19.5	20	79	131
DTX406200	20.0	20	79	131

- Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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YG-1 CO., LTD.

DREAM DRILL X

DTX408 SERIES

CARBIDE, DREAM DRILL X with COOLANT HOLES (5XD)

LONG

VOLLHARTMETALL DREAM SPIRALBOHRER mit KÜHLKANAL — LANG

Forets DREAM DRILLS carbure, avec arrosage central, série longue — LONGUE

PUNTE ELICOIDALI IN MD - DREAM DRILLS (con fori di refrigerazione) — LUNGA

- Upgraded coating for higher Tool Life in various materials
- Soft cutting action and reduced axial forces; Easy to Recondition
- Good self-centering even at low feed rates and unstable situations
- Excellent Chip breaking and chip evacuation

- Verbesserte Beschichtung für höhere Standzeit in verschiedenen Materialien
- Weicher Schnitt und reduzierte Axialkräfte; leicht nachzuschleifen
- Sehr gute Selbstzentrierung auch bei niedrigen Vorschubgeschwindigkeiten und labilen Verhältnissen
- Hervorragender Spanbruch und Spanabfuhr

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | RCH Coating

p.A93

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D1	D2	L1	L2
DTX408066	6.6	8	53	91
DTX408067	6.7	8	53	91
DTX408068	6.8	8	53	91
DTX408069	6.9	8	53	91
DTX408070	7.0	8	53	91
DTX408071	7.1	8	53	91
DTX408072	7.2	8	53	91
DTX408073	7.3	8	53	91
DTX408074	7.4	8	53	91
DTX408075	7.5	8	53	91
DTX408076	7.6	8	53	91
DTX408077	7.7	8	53	91
DTX408078	7.8	8	53	91
DTX408079	7.9	8	53	91
DTX408080	8.0	8	53	91
DTX408081	8.1	10	61	103
DTX408082	8.2	10	61	103
DTX408083	8.3	10	61	103
DTX408084	8.4	10	61	103
DTX408085	8.5	10	61	103
DTX408086	8.6	10	61	103
DTX408087	8.7	10	61	103
DTX408088	8.8	10	61	103
DTX408089	8.9	10	61	103
DTX408090	9.0	10	61	103
DTX408091	9.1	10	61	103
DTX408092	9.2	10	61	103
DTX408093	9.3	10	61	103

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D1	D2	L1	L2
DTX408094	9.4	10	61	103
DTX408095	9.5	10	61	103
DTX408096	9.6	10	61	103
DTX408097	9.7	10	61	103
DTX408098	9.8	10	61	103
DTX408099	9.9	10	61	103
DTX408100	10.0	10	61	103
DTX408101	10.1	12	71	118
DTX408102	10.2	12	71	118
DTX408103	10.3	12	71	118
DTX408104	10.4	12	71	118
DTX408105	10.5	12	71	118
DTX408106	10.6	12	71	118
DTX408107	10.7	12	71	118
DTX408108	10.8	12	71	118
DTX408109	10.9	12	71	118
DTX408110	11.0	12	71	118
DTX408111	11.1	12	71	118
DTX408112	11.2	12	71	118
DTX408113	11.3	12	71	118
DTX408114	11.4	12	71	118
DTX408115	11.5	12	71	118
DTX408116	11.6	12	71	118
DTX408117	11.7	12	71	118
DTX408118	11.8	12	71	118
DTX408119	11.9	12	71	118
DTX408120	12.0	12	71	118
DTX408125	12.5	14	77	124

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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DREAM DRILL X

DTX421 SERIES

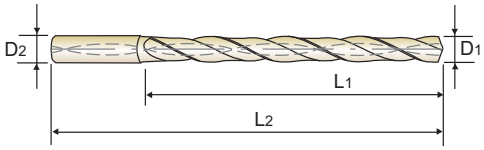
CARBIDE, DREAM DRILL X with COOLANT HOLES (8XD)

EXTRA LONG
ÜBERLANG
EXTRA-LONGUE
EXTRA LUNGA

VOLLHARTMETALL DREAM SPIRALBOHRER mit KÜHLKANAL
Forets DREAM DRILLS carbure, avec arrosage central, série extra-longue
PUNTE ELICOIDALI IN MD - DREAM DRILLS (con fori di refrigerazione)

- Upgraded coating for higher Tool Life in various materials
- Soft cutting action and reduced axial forces; Easy to Recondition
- Good self-centering even at low feed rates and unstable situations
- Excellent Chip breaking and chip evacuation

- Verbesserte Beschichtung für höhere Standzeit in verschiedenen Materialien
- Weicher Schnitt und reduzierte Axialkräfte; leicht nachzuschleifen
- Sehr gute Selbstzentrierung auch bei niedrigen Vorschubgeschwindigkeiten und labilen Verhältnissen
- Hervorragender Spanbruch und Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | RCH Coating

p.A93

8 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D1	D2	L1	L2
DTX421030	3.0	6	34	72
DTX421031	3.1	6	34	72
DTX421032	3.2	6	34	72
DTX421033	3.3	6	34	72
DTX421034	3.4	6	34	72
DTX421035	3.5	6	34	72
DTX421036	3.6	6	34	72
DTX421037	3.7	6	34	72
DTX421038	3.8	6	43	81
DTX421039	3.9	6	43	81
DTX421040	4.0	6	43	81
DTX421041	4.1	6	43	81
DTX421042	4.2	6	43	81
DTX421043	4.3	6	43	81
DTX421044	4.4	6	43	81
DTX421045	4.5	6	43	81
DTX421046	4.6	6	43	81
DTX421047	4.7	6	43	81
DTX421048	4.8	6	57	95
DTX421049	4.9	6	57	95
DTX421050	5.0	6	57	95
DTX421051	5.1	6	57	95
DTX421052	5.2	6	57	95
DTX421053	5.3	6	57	95
DTX421054	5.4	6	57	95
DTX421055	5.5	6	57	95
DTX421056	5.6	6	57	95
DTX421057	5.7	6	57	95

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
RCH-Coating	D1	D2	L1	L2
DTX421058	5.8	6	57	95
DTX421059	5.9	6	57	95
DTX421060	6.0	6	57	95
DTX421061	6.1	8	76	114
DTX421062	6.2	8	76	114
DTX421063	6.3	8	76	114
DTX421064	6.4	8	76	114
DTX421065	6.5	8	76	114
DTX421066	6.6	8	76	114
DTX421067	6.7	8	76	114
DTX421068	6.8	8	76	114
DTX421069	6.9	8	76	114
DTX421070	7.0	8	76	114
DTX421071	7.1	8	76	114
DTX421072	7.2	8	76	114
DTX421073	7.3	8	76	114
DTX421074	7.4	8	76	114
DTX421075	7.5	8	76	114
DTX421076	7.6	8	76	114
DTX421077	7.7	8	76	114
DTX421078	7.8	8	76	114
DTX421079	7.9	8	76	114
DTX421080	8.0	8	76	114
DTX421081	8.1	10	95	142
DTX421082	8.2	10	95	142
DTX421083	8.3	10	95	142
DTX421084	8.4	10	95	142
DTX421085	8.5	10	95	142

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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DREAM DRILL X

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

DTX404, DTX423, DTX424 SERIES without COOLANT HOLES

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 1.0	2.0	Vc	Parameter	Drill Diameter (mm) 3.0	4.0	5.0	6.0
P	2	Non-alloy steel	70	RPM	22280	11140	100	RPM	10610	7960	6370	5310
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	3		70	RPM	22280	11140	100	RPM	10610	7960	6370	5310
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	4		70	RPM	22280	11140	100	RPM	10610	7960	6370	5310
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
	5		60	RPM	19100	9550	80	RPM	8490	6370	5090	4240
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
	6	Low alloy steel	70	RPM	22280	11140	100	RPM	10610	7960	6370	5310
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	7		60	RPM	19100	9550	80	RPM	8490	6370	5090	4240
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	8		60	RPM	19100	9550	80	RPM	8490	6370	5090	4240
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
	9		30	RPM	9550	4770	40	RPM	4240	3180	2550	2120
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14	0.10-0.16
	10	High alloyed steel, and tool steel	50	RPM	15920	7960	70	RPM	7430	5570	4460	3710
				FEED	0.03-0.05	0.05-0.07		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
	11		30	RPM	9550	4770	40	RPM	4240	3180	2550	2120
				FEED	0.02-0.04	0.03-0.05		FEED	0.03-0.08	0.05-0.11	0.08-0.14	0.10-0.16
M	12	Stainless steel	50	RPM	15920	7960	70	RPM	7430	5570	4460	3710
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	13		35	RPM	11140	5570	45	RPM	4770	3580	2860	2390
				FEED	0.02-0.04	0.03-0.05		FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
K	15	Grey cast iron	70	RPM	22280	11140	100	RPM	10610	7960	6370	5310
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
	16		65	RPM	20690	10350	80	RPM	8490	6370	5090	4240
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	17	Nodular cast iron	70	RPM	22280	11140	100	RPM	10610	7960	6370	5310
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
	18		50	RPM	15920	7960	70	RPM	7430	5570	4460	3710
				FEED	0.04-0.06	0.04-0.06		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
	19	Malleable cast iron	60	RPM	19100	9550	80	RPM	8490	6370	5090	4240
				FEED	0.04-0.06	0.04-0.06		FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
	20		50	RPM	15920	7960	70	RPM	7430	5570	4460	3710
				FEED	0.03-0.05	0.05-0.07		FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
H	38	Hardened steel	20	RPM	6370	3180	25	RPM	2650	1990	1590	1330
				FEED	0.01-0.02	0.01-0.03		FEED	0.01-0.03	0.01-0.04	0.02-0.05	0.03-0.06

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	3		100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	4		100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	5		80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	6	Low alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	7		80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	8		80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	9		40	RPM	1590	1270	1060	910	800	710	640
				FEED	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
	10	High alloyed steel, and tool steel	70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	11		40	RPM	1590	1270	1060	910	800	710	640
				FEED	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
M	12	Stainless steel	70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	13		45	RPM	1790	1430	1190	1020	900	800	720
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
K	15	Grey cast iron	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	16		80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	17	Nodular cast iron	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	18		70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	19	Malleable cast iron	80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	20		70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
H	38	Hardened steel	25	RPM	990	800	660	570	500	440	400
				FEED	0.03-0.06	0.04-0.07	0.04-0.08	0.05-0.09	0.05-0.09	0.05-0.10	0.05-0.10

▶ Recommend to reduce the feed rate as following **Feed 100%** : DTX404(3×D), DTX423(3×D), DTX424(5×D)

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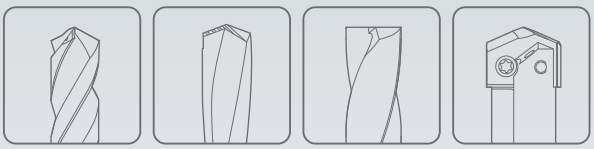
YG-1 CO., LTD.

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

SOLID CARBIDE

DREAM DRILLS -GENERAL

DREAM DRILLS - UNIVERSAL

- For General Purpose (HRc30 to HRc50)
- Für allgemeine Anwendungen (HRc30 bis HRc50)

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	DH404	DH423 DH443
DRILLING DEPTH	3XD	3XD
LENGTH	STUB	SHORT
SIZE MIN	D3.0	D3.0
SIZE MAX	D20.0	D20.0
PAGE	A98	A100
SURFACE TREATMENT	TiAlN	

SOLID CARBIDE DREAM DRILLS GENERAL

For General Purpose (HRc30 to HRc50)

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A114

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DH404	DH423 DH443
P	1	Non-alloy steel	About 0.15% C	Annealed	125			
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29	◎	◎
	8			Quenched & Tempered	300	32	○	○
	9			Quenched & Tempered	350	38	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎
	11			Quenched & Tempered	325	35	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○
	17	Nodular cast iron	Ferritic		160	3	◎	◎
	18		Pearlitic		250	25	○	○
	19	Malleable cast iron	Ferritic		130		◎	◎
	20		Pearlitic		230	21	○	○
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55	○	○
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

DREAM DRILLS - GENERAL

DH404 SERIES

CARBIDE, DREAM DRILLS

STUB
EXTRA KURZ
EXTRA-COURTE
EXTRA CORTA

VOLLHARTMETALL DREAM SPIRALBOHRER
Forets DREAM DRILLS carbure, série extra-courte
PUNTE ELICOIDALI IN MD - DREAM DRILLS

- Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- Self centering and chip breaking by R-thinning
- Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- Optimized flute shape for strength of drilling and smooth chip evacuation

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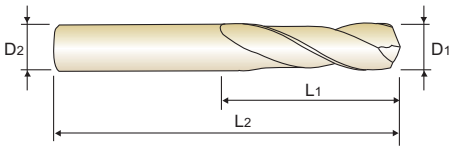
- Selbst zentrierend und guter Spanbruch durch die R-Ausspitzung
- Wellenform und Neagtivfase auf der Schneide bewirken geringen Schub, stabiles Drehmoment und lange Standzeit
- Optimierte Nutenform für Hochleistungsbohren und leichte Spanabfuhr



DIN 6539 | CARBIDE | 30° | h6 | h7 | 140° | TiAlN

p.A114

$D_1=D_2$

3 × D

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
TiAlN	D_1	L_1	L_2
DH404030	3.0	16	46
DH404031	3.1	18	49
DH404032	3.2	18	49
DH404033	3.3	18	49
DH404034	3.4	20	52
DH404035	3.5	20	52
DH404036	3.6	20	52
DH404037	3.7	20	52
DH404038	3.8	22	55
DH404039	3.9	22	55
DH404040	4.0	22	55
DH404041	4.1	22	55
DH404042	4.2	22	55
DH404043	4.3	24	58
DH404044	4.4	24	58
DH404045	4.5	24	58
DH404046	4.6	24	58
DH404047	4.7	24	58
DH404048	4.8	26	62
DH404049	4.9	26	62
DH404050	5.0	26	62
DH404051	5.1	26	62
DH404052	5.2	26	62
DH404053	5.3	26	62

EDP No.	Drill Diameter	Flute Length	Overall Length
TiAlN	D_1	L_1	L_2
DH404054	5.4	28	66
DH404055	5.5	28	66
DH404056	5.6	28	66
DH404057	5.7	28	66
DH404058	5.8	28	66
DH404059	5.9	28	66
DH404060	6.0	28	66
DH404061	6.1	31	70
DH404062	6.2	31	70
DH404063	6.3	31	70
DH404064	6.4	31	70
DH404065	6.5	31	70
DH404066	6.6	31	70
DH404067	6.7	31	70
DH404068	6.8	34	74
DH404069	6.9	34	74
DH404070	7.0	34	74
DH404071	7.1	34	74
DH404072	7.2	34	74
DH404073	7.3	34	74
DH404074	7.4	34	74
DH404075	7.5	34	74
DH404076	7.6	37	79
DH404077	7.7	37	79

- Other shank types are available on your request.

NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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DREAM DRILLS - GENERAL

PLAIN SHANK **DH423** SERIES
FLAT SHANK **DH443** SERIES

CARBIDE, DREAM DRILLS

SHORT
KURZ
COURTE
CORTA

VOLLHARTMETALL DREAM SPIRALBOHRER
Forets DREAM DRILLS carbure, série courte
PUNTE ELICOIDALI IN MD - DREAM DRILLS

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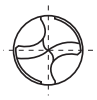

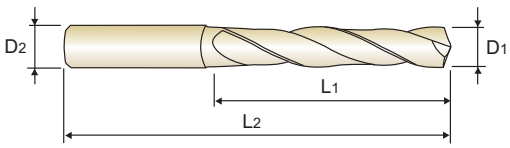

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | TiAlN

p.A114

3 × D

Unit : mm

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D_1	D_2	L_1	L_2
DH423030	DH443030	3.0	6	20	62
DH423031	DH443031	3.1	6	20	62
DH423032	DH443032	3.2	6	20	62
DH423033	DH443033	3.3	6	20	62
DH423034	DH443034	3.4	6	20	62
DH423035	DH443035	3.5	6	20	62
DH423036	DH443036	3.6	6	20	62
DH423037	DH443037	3.7	6	20	62
DH423038	DH443038	3.8	6	24	66
DH423039	DH443039	3.9	6	24	66
DH423040	DH443040	4.0	6	24	66
DH423041	DH443041	4.1	6	24	66
DH423042	DH443042	4.2	6	24	66
DH423043	DH443043	4.3	6	24	66
DH423044	DH443044	4.4	6	24	66
DH423045	DH443045	4.5	6	24	66
DH423046	DH443046	4.6	6	24	66
DH423047	DH443047	4.7	6	24	66
DH423048	DH443048	4.8	6	28	66
DH423049	DH443049	4.9	6	28	66
DH423050	DH443050	5.0	6	28	66
DH423051	DH443051	5.1	6	28	66
DH423052	DH443052	5.2	6	28	66
DH423053	DH443053	5.3	6	28	66

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D_1	D_2	L_1	L_2
DH423054	DH443054	5.4	6	28	66
DH423055	DH443055	5.5	6	28	66
DH423056	DH443056	5.6	6	28	66
DH423057	DH443057	5.7	6	28	66
DH423058	DH443058	5.8	6	28	66
DH423059	DH443059	5.9	6	28	66
DH423060	DH443060	6.0	6	28	66
DH423061	DH443061	6.1	8	34	79
DH423062	DH443062	6.2	8	34	79
DH423063	DH443063	6.3	8	34	79
DH423064	DH443064	6.4	8	34	79
DH423065	DH443065	6.5	8	34	79
DH423066	DH443066	6.6	8	34	79
DH423067	DH443067	6.7	8	34	79
DH423068	DH443068	6.8	8	34	79
DH423069	DH443069	6.9	8	34	79
DH423070	DH443070	7.0	8	34	79
DH423071	DH443071	7.1	8	41	79
DH423072	DH443072	7.2	8	41	79
DH423073	DH443073	7.3	8	41	79
DH423074	DH443074	7.4	8	41	79
DH423075	DH443075	7.5	8	41	79
DH423076	DH443076	7.6	8	41	79
DH423077	DH443077	7.7	8	41	79

- Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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DREAM DRILLS - GENERAL

PLAIN SHANK **DH423** SERIES
FLAT SHANK **DH443** SERIES

CARBIDE, DREAM DRILLS

SHORT

VOLLHARTMETALL DREAM SPIRALBOHRER
Forets DREAM DRILLS carbure, série courte
PUNTE ELICOIDALI IN MD - DREAM DRILLS

KURZ
COURTE
CORTA

- Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
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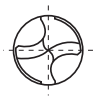

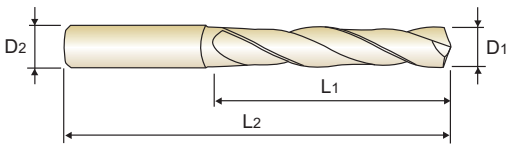

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | TiAlN

p.A114

3 × D

Unit : mm

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D_1	D_2	L_1	L_2
DH423138	DH443138	13.8	14	60	107
DH423140	DH443140	14.0	14	60	107
DH423145	DH443145	14.5	16	65	115
DH423148	DH443148	14.8	16	65	115
DH423150	DH443150	15.0	16	65	115
DH423155	DH443155	15.5	16	65	115
DH423158	DH443158	15.8	16	65	115
DH423160	DH443160	16.0	16	65	115
DH423165	DH443165	16.5	18	73	123
DH423168	DH443168	16.8	18	73	123

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D_1	D_2	L_1	L_2
DH423170	DH443170	17.0	18	73	123
DH423175	DH443175	17.5	18	73	123
DH423178	DH443178	17.8	18	73	123
DH423180	DH443180	18.0	18	73	123
DH423185	DH443185	18.5	20	79	131
DH423190	DH443190	19.0	20	79	131
DH423195	DH443195	19.5	20	79	131
DH423198	DH443198	19.8	20	79	131
DH423200	DH443200	20.0	20	79	131

- Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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DREAM DRILLS - GENERAL

PLAIN SHANK **DH424** SERIES
FLAT SHANK **DH444** SERIES

CARBIDE, DREAM DRILLS

LONG
LANG
LONGUE
LUNGA

VOLLHARTMETALL DREAM SPIRALBOHRER
Forets DREAM DRILLS carbure, série longue
PUNTE ELICOIDALI IN MD - DREAM DRILLS

- Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
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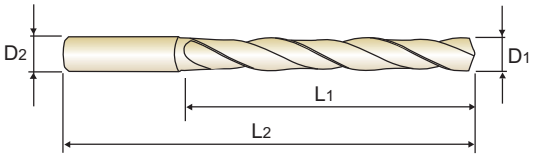

DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | TiAlN

p.A114

5 × D

Unit : mm

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D_1	D_2	L_1	L_2
DH424058	DH444058	5.8	6	44	82
DH424059	DH444059	5.9	6	44	82
DH424060	DH444060	6.0	6	44	82
DH424061	DH444061	6.1	8	53	91
DH424062	DH444062	6.2	8	53	91
DH424063	DH444063	6.3	8	53	91
DH424064	DH444064	6.4	8	53	91
DH424065	DH444065	6.5	8	53	91
DH424066	DH444066	6.6	8	53	91
DH424067	DH444067	6.7	8	53	91
DH424068	DH444068	6.8	8	53	91
DH424069	DH444069	6.9	8	53	91
DH424070	DH444070	7.0	8	53	91
DH424071	DH444071	7.1	8	53	91
DH424072	DH444072	7.2	8	53	91
DH424073	DH444073	7.3	8	53	91
DH424074	DH444074	7.4	8	53	91
DH424075	DH444075	7.5	8	53	91
DH424076	DH444076	7.6	8	53	91
DH424077	DH444077	7.7	8	53	91
DH424078	DH444078	7.8	8	53	91
DH424079	DH444079	7.9	8	53	91
DH424080	DH444080	8.0	8	53	91
DH424081	DH444081	8.1	10	61	103

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D_1	D_2	L_1	L_2
DH424082	DH444082	8.2	10	61	103
DH424083	DH444083	8.3	10	61	103
DH424084	DH444084	8.4	10	61	103
DH424085	DH444085	8.5	10	61	103
DH424086	DH444086	8.6	10	61	103
DH424087	DH444087	8.7	10	61	103
DH424088	DH444088	8.8	10	61	103
DH424089	DH444089	8.9	10	61	103
DH424090	DH444090	9.0	10	61	103
DH424091	DH444091	9.1	10	61	103
DH424092	DH444092	9.2	10	61	103
DH424093	DH444093	9.3	10	61	103
DH424094	DH444094	9.4	10	61	103
DH424095	DH444095	9.5	10	61	103
DH424096	DH444096	9.6	10	61	103
DH424097	DH444097	9.7	10	61	103
DH424098	DH444098	9.8	10	61	103
DH424099	DH444099	9.9	10	61	103
DH424100	DH444100	10.0	10	61	103
DH424101	DH444101	10.1	12	71	118
DH424102	DH444102	10.2	12	71	118
DH424103	DH444103	10.3	12	71	118
DH424104	DH444104	10.4	12	71	118
DH424105	DH444105	10.5	12	71	118

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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DREAM DRILLS - GENERAL

PLAIN SHANK **DH406** SERIES
FLAT SHANK **DH446** SERIES

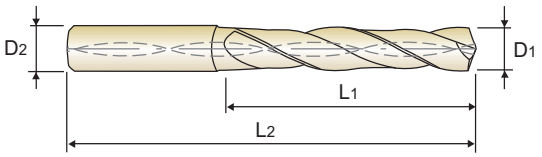
CARBIDE, DREAM DRILLS with COOLANT HOLES

SHORT

VOLLHARTMETALL DREAM SPIRALBOHRER mit KÜHLKANAL — KURZ
Forets DREAM DRILLS carbure, avec arrosage central, série courte — COURTE
PUNTE ELICOIDALI IN MD - DREAM DRILLS (con fori di refrigerazione) — CORTA

- Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- Self centering and chip breaking by R-thinning
- Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- Optimized flute shape for strength of drilling and smooth chip evacuation

- Bohren von Stahl, Stahlguss, Gusseisen, Temperguss, Nichteisenmetallen-Leichtmetallen, abrasiven Kunststoffen
- Selbst zentrierend und guter Spanbruch durch die R-Ausspitzung
- Wellenform und Neagtivfase auf der Schneide bewirken geringen Schub, stabiles Drehmoment und lange Standzeit
- Optimierte Nutenform für Hochleistungsbohren und leichte Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p.A115

3 × D

Unit : mm

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH406030	DH446030	3.0	6	20	62
DH406031	DH446031	3.1	6	20	62
DH406032	DH446032	3.2	6	20	62
DH406033	DH446033	3.3	6	20	62
DH406034	DH446034	3.4	6	20	62
DH406035	DH446035	3.5	6	20	62
DH406036	DH446036	3.6	6	20	62
DH406037	DH446037	3.7	6	20	62
DH406038	DH446038	3.8	6	24	66
DH406039	DH446039	3.9	6	24	66
DH406040	DH446040	4.0	6	24	66
DH406041	DH446041	4.1	6	24	66
DH406042	DH446042	4.2	6	24	66
DH406043	DH446043	4.3	6	24	66
DH406044	DH446044	4.4	6	24	66
DH406045	DH446045	4.5	6	24	66
DH406046	DH446046	4.6	6	24	66
DH406047	DH446047	4.7	6	24	66
DH406048	DH446048	4.8	6	28	66
DH406049	DH446049	4.9	6	28	66
DH406050	DH446050	5.0	6	28	66
DH406051	DH446051	5.1	6	28	66
DH406052	DH446052	5.2	6	28	66
DH406053	DH446053	5.3	6	28	66

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH406054	DH446054	5.4	6	28	66
DH406055	DH446055	5.5	6	28	66
DH406056	DH446056	5.6	6	28	66
DH406057	DH446057	5.7	6	28	66
DH406058	DH446058	5.8	6	28	66
DH406059	DH446059	5.9	6	28	66
DH406060	DH446060	6.0	6	28	66
DH406061	DH446061	6.1	8	34	79
DH406062	DH446062	6.2	8	34	79
DH406063	DH446063	6.3	8	34	79
DH406064	DH446064	6.4	8	34	79
DH406065	DH446065	6.5	8	34	79
DH406066	DH446066	6.6	8	34	79
DH406067	DH446067	6.7	8	34	79
DH406068	DH446068	6.8	8	34	79
DH406069	DH446069	6.9	8	34	79
DH406070	DH446070	7.0	8	34	79
DH406071	DH446071	7.1	8	41	79
DH406072	DH446072	7.2	8	41	79
DH406073	DH446073	7.3	8	41	79
DH406074	DH446074	7.4	8	41	79
DH406075	DH446075	7.5	8	41	79
DH406076	DH446076	7.6	8	41	79
DH406077	DH446077	7.7	8	41	79

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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YG-1 CO., LTD.

DREAM DRILLS - GENERAL

PLAIN SHANK **DH406** SERIES
FLAT SHANK **DH446** SERIES

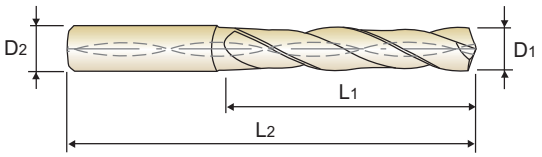
CARBIDE, DREAM DRILLS with COOLANT HOLES

SHORT

VOLLHARTMETALL DREAM SPIRALBOHRER mit KÜHLKANAL — *KURZ*
Forets DREAM DRILLS carbure, avec arrosage central, série courte — *COURTE*
PUNTE ELICOIDALI IN MD - DREAM DRILLS (con fori di refrigerazione) — *CORTA*

- ▶ Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- ▶ Self centering and chip breaking by R-thinning
- ▶ Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- ▶ Optimized flute shape for strength of drilling and smooth chip evacuation

- ▶ Bohren von Stahl, Stahlguss, Gusseisen, Temperguss, Nichteisenmetallen-Leichtmetallen, abrasiven Kunststoffen
- ▶ Selbst zentrierend und guter Spanbruch durch die R-Ausspitzung
- ▶ Wellenform und Neagtivfase auf der Schneide bewirken geringen Schub, stabiles Drehmoment und lange Standzeit
- ▶ Optimierte Nutenform für Hochleistungsbohren und leichte Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p.A115

3 × D

Unit : mm

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D_1	D_2	L_1	L_2
DH406150	DH446150	15.0	16	65	115
DH406155	DH446155	15.5	16	65	115
DH406160	DH446160	16.0	16	65	115
DH406165	DH446165	16.5	18	73	123
DH406170	DH446170	17.0	18	73	123
DH406175	DH446175	17.5	18	73	123

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D_1	D_2	L_1	L_2
DH406180	DH446180	18.0	18	73	123
DH406185	DH446185	18.5	20	79	131
DH406190	DH446190	19.0	20	79	131
DH406195	DH446195	19.5	20	79	131
DH406200	DH446200	20.0	20	79	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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DREAM DRILLS - GENERAL

PLAIN SHANK **DH408** SERIES
FLAT SHANK **DH448** SERIES

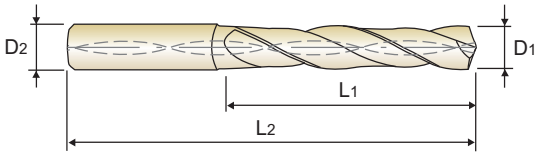
CARBIDE, DREAM DRILLS with COOLANT HOLES

LONG
LANG
LONGUE
LUNGA

VOLLHARTMETALL DREAM SPIRALBOHRER mit KÜHLKANAL
Forets DREAM DRILLS carbure, avec arrosage central, série longue
PUNTE ELICOIDALI IN MD - DREAM DRILLS (con fori di refrigerazione)

- Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- Self centering and chip breaking by R-thinning
- Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- Optimized flute shape for strength of drilling and smooth chip evacuation

- Bohren von Stahl, Stahlguss, Gusseisen, Temperguss, Nichteisenmetallen-Leichtmetallen, abrasiven Kunststoffen
- Selbst zentrierend und guter Spanbruch durch die R-Ausspitzung
- Wellenform und Neagtivfase auf der Schneide bewirken geringen Schub, stabiles Drehmoment und lange Standzeit
- Optimierte Nutenform für Hochleistungsbohren und leichte Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p.A115

5 × D

Unit : mm

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH408058	DH448058	5.8	6	44	82
DH408059	DH448059	5.9	6	44	82
DH408060	DH448060	6.0	6	44	82
DH408061	DH448061	6.1	8	53	91
DH408062	DH448062	6.2	8	53	91
DH408063	DH448063	6.3	8	53	91
DH408064	DH448064	6.4	8	53	91
DH408065	DH448065	6.5	8	53	91
DH408066	DH448066	6.6	8	53	91
DH408067	DH448067	6.7	8	53	91
DH408068	DH448068	6.8	8	53	91
DH408069	DH448069	6.9	8	53	91
DH408070	DH448070	7.0	8	53	91
DH408071	DH448071	7.1	8	53	91
DH408072	DH448072	7.2	8	53	91
DH408073	DH448073	7.3	8	53	91
DH408074	DH448074	7.4	8	53	91
DH408075	DH448075	7.5	8	53	91
DH408076	DH448076	7.6	8	53	91
DH408077	DH448077	7.7	8	53	91
DH408078	DH448078	7.8	8	53	91
DH408079	DH448079	7.9	8	53	91
DH408080	DH448080	8.0	8	53	91
DH408081	DH448081	8.1	10	61	103

EDP No. (TiAlN)		Drill Diameter	Shank Diameter	Flute Length	Overall Length
Plain	Flat	D1	D2	L1	L2
DH408082	DH448082	8.2	10	61	103
DH408083	DH448083	8.3	10	61	103
DH408084	DH448084	8.4	10	61	103
DH408085	DH448085	8.5	10	61	103
DH408086	DH448086	8.6	10	61	103
DH408087	DH448087	8.7	10	61	103
DH408088	DH448088	8.8	10	61	103
DH408089	DH448089	8.9	10	61	103
DH408090	DH448090	9.0	10	61	103
DH408091	DH448091	9.1	10	61	103
DH408092	DH448092	9.2	10	61	103
DH408093	DH448093	9.3	10	61	103
DH408094	DH448094	9.4	10	61	103
DH408095	DH448095	9.5	10	61	103
DH408096	DH448096	9.6	10	61	103
DH408097	DH448097	9.7	10	61	103
DH408098	DH448098	9.8	10	61	103
DH408099	DH448099	9.9	10	61	103
DH408100	DH448100	10.0	10	61	103
DH408101	DH448101	10.1	12	71	118
DH408102	DH448102	10.2	12	71	118
DH408103	DH448103	10.3	12	71	118
DH408104	DH448104	10.4	12	71	118
DH408105	DH448105	10.5	12	71	118

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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YG-1 CO., LTD.

DREAM DRILLS - GENERAL

DH421 SERIES

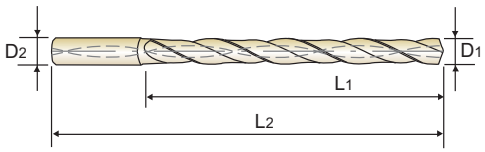
CARBIDE, DREAM DRILLS with COOLANT HOLES

EXTRA LONG
ÜBERLANG
EXTRA-LONGUE
EXTRA LUNGA

VOLLHARTMETALL DREAM SPIRALBOHRER mit KÜHLKANAL
Forets DREAM DRILLS carbure, avec arrosage central, série extra-longue
PUNTE ELICOIDALI IN MD - DREAM DRILLS (con fori di refrigerazione)

- Drilling for Steel, Cast Steel, Cast Iron, Malleable Cast Iron
- Self centering and chip breaking by R-thinning
- Wave shape and negative land on the cutting edge for low thrust, stable torque and long tool life
- Optimized flute shape for strength of drilling and smooth chip evacuation

- Bohren von Stahl, Stahlguss, Gusseisen, Temperguss, Nichteisenmetallen-Leichtmetallen, abrasiven Kunststoffen
- Selbst zentrierend und guter Spanbruch durch die R-Ausspitzung
- Wellenform und Neagtivfase auf der Schneide bewirken geringen Schub, stabiles Drehmoment und lange Standzeit
- Optimierte Nutenform für Hochleistungsbohren und leichte Spanabfuhr



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p.A115

8 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH421030	3.0	6	34	72
DH421031	3.1	6	34	72
DH421032	3.2	6	34	72
DH421033	3.3	6	34	72
DH421034	3.4	6	34	72
DH421035	3.5	6	34	72
DH421036	3.6	6	34	72
DH421037	3.7	6	34	72
DH421038	3.8	6	43	81
DH421039	3.9	6	43	81
DH421040	4.0	6	43	81
DH421041	4.1	6	43	81
DH421042	4.2	6	43	81
DH421043	4.3	6	43	81
DH421044	4.4	6	43	81
DH421045	4.5	6	43	81
DH421046	4.6	6	43	81
DH421047	4.7	6	43	81
DH421048	4.8	6	57	95
DH421049	4.9	6	57	95
DH421050	5.0	6	57	95
DH421051	5.1	6	57	95
DH421052	5.2	6	57	95
DH421053	5.3	6	57	95

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH421054	5.4	6	57	95
DH421055	5.5	6	57	95
DH421056	5.6	6	57	95
DH421057	5.7	6	57	95
DH421058	5.8	6	57	95
DH421059	5.9	6	57	95
DH421060	6.0	6	57	95
DH421061	6.1	8	76	114
DH421062	6.2	8	76	114
DH421063	6.3	8	76	114
DH421064	6.4	8	76	114
DH421065	6.5	8	76	114
DH421066	6.6	8	76	114
DH421067	6.7	8	76	114
DH421068	6.8	8	76	114
DH421069	6.9	8	76	114
DH421070	7.0	8	76	114
DH421071	7.1	8	76	114
DH421072	7.2	8	76	114
DH421073	7.3	8	76	114
DH421074	7.4	8	76	114
DH421075	7.5	8	76	114
DH421076	7.6	8	76	114
DH421077	7.7	8	76	114

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○	○	○		◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○			

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YG-1 CO., LTD.

DREAM DRILLS - GENERAL

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

DH404, DH423, DH443, DH424, DH444 SERIES without COOLANT HOLES

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

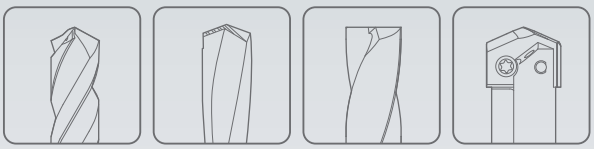
ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 1.0	2.0
P	2	Non-alloy steel	70	RPM	22280	11140
				FEED	0.03-0.05	0.05-0.07
	3		70	RPM	22280	11140
				FEED	0.03-0.05	0.05-0.07
	4		70	RPM	22280	11140
				FEED	0.03-0.05	0.05-0.07
	5		60	RPM	19100	9550
				FEED	0.03-0.05	0.05-0.07
	6	Low alloy steel	70	RPM	22280	11140
				FEED	0.03-0.05	0.05-0.07
	7		60	RPM	19100	9550
				FEED	0.03-0.05	0.05-0.07
	8		60	RPM	19100	9550
				FEED	0.02-0.04	0.03-0.05
	9		30	RPM	9550	4770
				FEED	0.02-0.04	0.03-0.05
	10	High alloyed steel, and tool steel	50	RPM	15920	7960
				FEED	0.03-0.05	0.05-0.07
	11		30	RPM	9550	4770
				FEED	0.02-0.04	0.03-0.05
M	12	Stainless steel	50	RPM	15920	7960
				FEED	0.03-0.05	0.05-0.07
	13		35	RPM	11140	5570
					0.02-0.04	0.03-0.05
K	15	Grey cast iron	70	RPM	22280	11140
				FEED	0.04-0.06	0.04-0.06
	16		65	RPM	20690	10350
				FEED	0.04-0.06	0.04-0.06
	17	Nodular cast iron	70	RPM	22280	11140
				FEED	0.04-0.06	0.04-0.06
	18		50	RPM	15920	7960
				FEED	0.04-0.06	0.04-0.06
	19	Malleable cast iron	60	RPM	19100	9550
				FEED	0.04-0.06	0.04-0.06
	20		50	RPM	15920	7960
					0.03-0.05	0.05-0.07
H	38	Hardened steel	20	RPM	6370	3180
				FEED	0.01-0.02	0.01-0.03

Vc	Parameter	Drill Diameter (mm) 3.0	4.0	5.0	6.0
100	RPM	10610	7960	6370	5310
	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
100	RPM	10610	7960	6370	5310
	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
100	RPM	10610	7960	6370	5310
	FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
80	RPM	8490	6370	5090	4240
	FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
100	RPM	10610	7960	6370	5310
	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
80	RPM	8490	6370	5090	4240
	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
80	RPM	8490	6370	5090	4240
	FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
40	RPM	4240	3180	2550	2120
	FEED	0.03-0.08	0.05-0.11	0.08-0.14	0.10-0.16
70	RPM	7430	5570	4460	3710
	FEED	0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
40	RPM	4240	3180	2550	2120
	FEED	0.03-0.08	0.05-0.11	0.08-0.14	0.10-0.16
70	RPM	7430	5570	4460	3710
	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
45	RPM	4770	3580	2860	2390
		0.04-0.10	0.07-0.13	0.10-0.16	0.12-0.18
100	RPM	10610	7960	6370	5310
	FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
80	RPM	8490	6370	5090	4240
	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
100	RPM	10610	7960	6370	5310
	FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
70	RPM	7430	5570	4460	3710
	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
80	RPM	8490	6370	5090	4240
	FEED	0.08-0.14	0.12-0.18	0.15-0.22	0.20-0.26
70	RPM	7430	5570	4460	3710
	FEED	0.06-0.12	0.08-0.14	0.14-0.20	0.16-0.22
25	RPM	2650	1990	1590	1330
	FEED	0.01-0.03	0.01-0.04	0.02-0.05	0.03-0.06

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	3		100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	4		100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	5		80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	6	Low alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	7		80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	8		80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	9		40	RPM	1590	1270	1060	910	800	710	640
				FEED	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
	10	High alloyed steel, and tool steel	70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
	11		40	RPM	1590	1270	1060	910	800	710	640
				FEED	0.12-0.18	0.13-0.19	0.14-0.20	0.15-0.21	0.16-0.22	0.17-0.25	0.18-0.28
M	12	Stainless steel	70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	13		45	RPM	1790	1430	1190	1020	900	800	720
				FEED	0.14-0.20	0.15-0.23	0.17-0.25	0.18-0.26	0.19-0.27	0.20-0.30	0.22-0.32
K	15	Grey cast iron	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	16		80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	17	Nodular cast iron	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	18		70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
	19	Malleable cast iron	80	RPM	3180	2550	2120	1820	1590	1410	1270
				FEED	0.22-0.28	0.25-0.33	0.27-0.35	0.29-0.37	0.31-0.39	0.32-0.42	0.34-0.44
	20		70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.18-0.24	0.19-0.27	0.21-0.29	0.23-0.31	0.25-0.33	0.28-0.38	0.30-0.40
H	38	Hardened steel	25	RPM	990	800	660	570	500	440	400
				FEED	0.03-0.06	0.04-0.07	0.04-0.08	0.05-0.09	0.05-0.09	0.05-0.10	0.05-0.10

▶ Recommend to reduce the feed rate as following **Feed 100%** : DH404(3×D), DH423(3×D), DH424(5×D)

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

SOLID CARBIDE

DREAM DRILLS -HIGH FEED

DREAM DRILLS - HIGH FEED

- 1.5 to 2 Times Faster Feeding Speed than 2-Flute Drill
  For Carbon Steels, Alloy Steels(up to HRc35) and Cast Iron

- 1,5 bis 2 mal höhere Vorschubgeschwindigkeit als Bohrer mit 2 Schneiden, für Kohlenstoffstähle, legierte Stähle (bis HRc35) und Grauguss

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	DGR493	DGR495
DRILLING DEPTH	3XD	5XD
LENGTH	SHORT	LONG
SIZE MIN	D5.1	D5.0
SIZE MAX	D20.0	D20.0
PAGE	A119	A121
SURFACE TREATMENT	H-Coating	

SOLID CARBIDE
DREAM DRILLS HIGH FEED

1.5 to 2 Times Faster Feeding Speed than 2-Flute Drill
for Carbon Steels, Alloy Steels(up to HRc35) and Cast Iron

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A123

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DGR493	DGR495
P	1	Non-alloy steel	About 0.15% C	Annealed	125			
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29	◎	◎
	8			Quenched & Tempered	300	32	○	○
	9			Quenched & Tempered	350	38	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎
	11			Quenched & Tempered	325	35	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○
	17	Nodular cast iron	Ferritic		160	3	◎	◎
	18		Pearlitic		250	25	○	○
	19	Malleable cast iron	Ferritic		130		◎	◎
	20		Pearlitic		230	21	○	○
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

DREAM DRILLS - HIGH FEED

DGR493 SERIES

CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES

SHORT

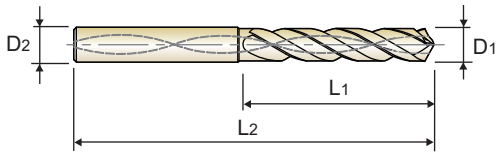
DREAM DRILLS HIGH FEED mit KÜHLKANAL — *KURZ*

Forets DREAM DRILLS carbure Grande Avance avec arrosage central, série courte — *COURTE*

PUNTE DREAM DRILL HIGH FEED (con i fori di refrigerazione) — *CORTA*

- ▶Drilling for Carbon Steels, Alloy Steels(-HRc35) and Cast Iron
- ▶Higher productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
- ▶Multi-Layer coating delivers much better productivity and reliability
- ▶Self centering and chip breaking by R-thinning and coolant holes

- ▶ Bohren von Kohlenstoff-Stählen, legierten Stählen(-HRc35) und Gusseisen
- ▶ Höhere Produktivität durch den 1,5 bis 2-fach höheren Vorschub gegenüber herkömmlichen zweischneidigen Bohrern
- ▶ Die Multi-Layer Beschichtung ermöglicht eine bessere Produktivität und Zuverlässigkeit
- ▶ Selbst zentrierend und guter Spanbruch durch die R-Ausspitzung



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | H Coating

p.A123

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
H-Coating	D1	D2	L1	L2
DGR493108	10.8	12	55	102
DGR493109	10.9	12	55	102
DGR493110	11.0	12	55	102
DGR493112	11.2	12	55	102
DGR493113	11.3	12	55	102
DGR493114	11.4	12	55	102
DGR493115	11.5	12	55	102
DGR493116	11.6	12	55	102
DGR493117	11.7	12	55	102
DGR493118	11.8	12	55	102
DGR493119	11.9	12	55	102
DGR493120	12.0	12	55	102
DGR493125	12.5	14	60	107
DGR493130	13.0	14	60	107
DGR493135	13.5	14	60	107
DGR493140	14.0	14	60	107
DGR493145	14.5	16	65	115
DGR493150	15.0	16	65	115
DGR493155	15.5	16	65	115
DGR493160	16.0	16	65	115

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
H-Coating	D1	D2	L1	L2
DGR493165	16.5	18	73	123
DGR493175	17.5	18	73	123
DGR493185	18.5	20	79	131
DGR493195	19.5	20	79	131
DGR493200	20.0	20	79	131

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○				◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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YG-1 CO., LTD.

DREAM DRILLS - HIGH FEED

DGR495 SERIES

CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES

LONG

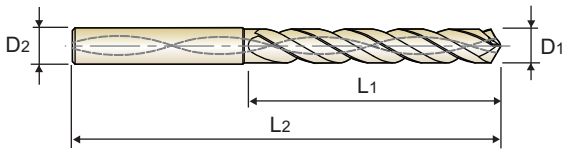
DREAM DRILLS HIGH FEED mit KÜHLKANAL — *KURZ*

Forets DREAM DRILLS carbure Grande Avance avec arrosage central, série longue — *LONGUE*

PUNTE DREAM DRILL HIGH FEED (con i fori di refrigerazione) — *LUNGA*

- ▶Drilling for Carbon Steels, Alloy Steels(-HRc35) and Cast Iron
- ▶Higher productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
- ▶Multi-Layer coating delivers much better productivity and reliability
- ▶Self centering and chip breaking by R-thinning and coolant holes

- ▶ Bohren von Kohlenstoff-Stählen, legierten Stählen(-HRc35) und Gusseisen
- ▶ Höhere Produktivität durch den 1,5 bis 2-fach höheren Vorschub gegenüber herkömmlichen zweischneidigen Bohrern
- ▶ Die Multi-Layer Beschichtung ermöglicht eine bessere Produktivität und Zuverlässigkeit
- ▶ Selbst zentrierend und guter Spanbruch durch die R-Ausspitzung



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | H Coating

p.A123

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
H-Coating	D_1	D_2	L_1	L_2
DGR495105	10.5	12	71	118
DGR495106	10.6	12	71	118
DGR495107	10.7	12	71	118
DGR495108	10.8	12	71	118
DGR495109	10.9	12	71	118
DGR495110	11.0	12	71	118
DGR495112	11.2	12	71	118
DGR495114	11.4	12	71	118
DGR495115	11.5	12	71	118
DGR495116	11.6	12	71	118
DGR495118	11.8	12	71	118
DGR495120	12.0	12	71	118
DGR495125	12.5	14	77	124
DGR495130	13.0	14	77	124
DGR495140	14.0	14	77	124
DGR495145	14.5	16	83	133
DGR495150	15.0	16	83	133
DGR495160	16.0	16	83	133
DGR495170	17.0	18	93	143
DGR495175	17.5	18	93	143

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
H-Coating	D_1	D_2	L_1	L_2
DGR495180	18.0	18	93	143
DGR495185	18.5	20	101	153
DGR495190	19.0	20	101	153
DGR495200	20.0	20	101	153

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎	○	◎	◎	○	○	◎	○				◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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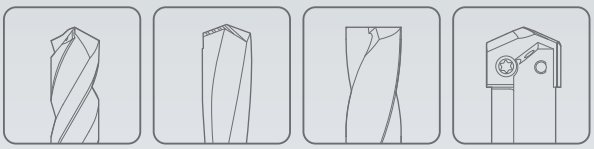
Global Cutting Tool Leader **YG-1**



HOLEMAKING

YG

Leading Through Innovation

SOLID CARBIDE

DREAM DRILLS - FLAT BOTTOM

DREAM DRILLS - FLACHBOHRER

- For Holes on Various Angled Surfaces
- Für Bohrungen auf verschiedenen abgewinkelten Oberflächen

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	DPP447	DH450
DRILLING DEPTH	2XD	5XD
LENGTH	SHORT	LONG
SIZE MIN	D3.0	D3.0
SIZE MAX	D20.0	D20.0
PAGE	A128	A130
SURFACE TREATMENT	X-Coating	TiAlN

SOLID CARBIDE
DREAM DRILLS FLAT BOTTOM

For Holes on Various Angled Surfaces

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A132

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DPP447	DH450
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	○	○
	5		About 0.75% C	Quenched & Tempered	300	32	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29	○	○
	8			Quenched & Tempered	300	32	○	○
	9			Quenched & Tempered	350	38	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60		○	○
	22		Curable	Hardened	100		○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

DREAM DRILLS - FLAT BOTTOM

DPP447 SERIES

CARBIDE, DREAM DRILLS - FLAT BOTTOM

SHORT

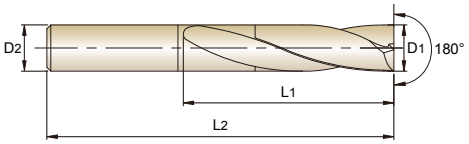
VHM, DREAM DRILLS - FLACHBOHRER — *KURZ*

DREAM DRILLS - FOND PLAT, FORET CARBURE MONOBLOC — *COURTE*

PUNTE IN MD DREAM DRILLS, TESTA PIANA — *CORTA*

- For holes on various angled surfaces.
- 180 degree point angle enables drilling of flat, inclined and curved surfaces.
- Optimized flute shape for excellent chip evacuation.
- High strength cutting edge to improve tool life and versatility drilling.
- For through holes, minimized burrs at entrance and exit when drilling thin plate.

- Für Bohrungen auf verschiedenen abgewinkelten Flächen.
- Der 180-Grad-Spitzenwinkel ermöglicht das Bohren von flachen, geneigten und gekrümmten Oberflächen.
- Optimierte Nutenform für hervorragende Spanabfuhr.
- Hochfeste Schneide zur Verbesserung der Standzeit und Vielseitigkeit beim Bohren.
- Für Durchgangsbohrungen, minimierter Grat am Ein- und Austritt beim Bohren von dünnen Blechen.



CARBIDE | 20° | h6 | h7 | 180° | X Coating

p.A132

2 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPP447030	3.0	6	16	50
DPP447031	3.1	6	16	50
DPP447032	3.2	6	16	50
DPP447033	3.3	6	16	50
DPP447034	3.4	6	18	50
DPP447035	3.5	6	18	50
DPP447036	3.6	6	18	50
DPP447037	3.7	6	18	50
DPP447038	3.8	6	18	50
DPP447039	3.9	6	18	50
DPP447040	4.0	6	18	50
DPP447041	4.1	6	20	60
DPP447042	4.2	6	20	60
DPP447043	4.3	6	20	60
DPP447044	4.4	6	20	60
DPP447045	4.5	6	22	60
DPP447046	4.6	6	22	60
DPP447047	4.7	6	22	60
DPP447048	4.8	6	22	60
DPP447049	4.9	6	22	60
DPP447050	5.0	6	22	60
DPP447051	5.1	6	24	60
DPP447052	5.2	6	24	60
DPP447053	5.3	6	24	60
DPP447054	5.4	6	24	60
DPP447055	5.5	6	24	60

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
X-Coating	D1	D2	L1	L2
DPP447056	5.6	6	24	60
DPP447057	5.7	6	26	60
DPP447058	5.8	6	26	60
DPP447059	5.9	6	26	60
DPP447060	6.0	6	26	60
DPP447061	6.1	8	28	70
DPP447062	6.2	8	28	70
DPP447063	6.3	8	28	70
DPP447064	6.4	8	30	70
DPP447065	6.5	8	30	70
DPP447068	6.8	8	30	70
DPP447069	6.9	8	30	70
DPP447070	7.0	8	30	70
DPP447071	7.1	8	34	70
DPP447072	7.2	8	34	70
DPP447074	7.4	8	34	70
DPP447075	7.5	8	34	70
DPP447076	7.6	8	34	70
DPP447077	7.7	8	34	70
DPP447078	7.8	8	34	70
DPP447079	7.9	8	34	70
DPP447080	8.0	8	34	70
DPP447081	8.1	10	38	80
DPP447082	8.2	10	38	80
DPP447083	8.3	10	38	80
DPP447084	8.4	10	38	80

▶ Other diameters and shank types are available upon request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○	○	◎	○	○	○			○			◎	○				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○																			

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DREAM DRILLS - FLAT BOTTOM

DH450 SERIES

CARBIDE, DREAM DRILLS - FLAT BOTTOM with COOLANT HOLES

LONG

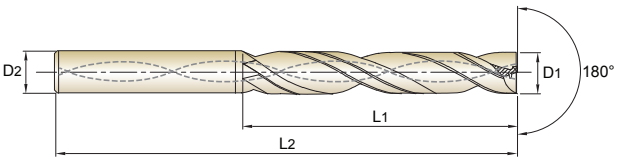
VHM, DREAM DRILLS - FLACHBOHRER *KURZ*

DREAM DRILLS - FOND PLAT, FORET CARBURE MONOBLOC *LONGUE*

PUNTE IN MD DREAM DRILLS, TESTA PIANA *LUNGA*

- For holes on various angled surfaces.
- 180 degree point angle enables drilling of flat, inclined and curved surfaces.
- Optimized flute shape for excellent chip evacuation.
- High strength cutting edge to improve tool life and versatility drilling.
- For through holes, minimized burrs at entrance and exit when drilling thin plate.
- Pilot Drilling for 5XD

- Für Bohrungen auf verschiedenen abgewinkelten Flächen.
- Der 180-Grad-Spitzenwinkel ermöglicht das Bohren von flachen, geneigten und gekrümmten Oberflächen.
- Optimierte Nutenform für hervorragende Spanabfuhr.
- Hochfeste Schneide zur Verbesserung der Standzeit und Vielseitigkeit beim Bohren.
- Für Durchgangsbohrungen, minimierter Grat am Ein- und Austritt beim Bohren von dünnen Blechen.
- Pilotbohren 5XD



DIN 6537 | CARBIDE | 30° | h6 | h7 | 180° | 20 bar | TiAlN

p.A133

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH450030	3.0	6	28	66
DH450031	3.1	6	28	66
DH450032	3.2	6	28	66
DH450033	3.3	6	28	66
DH450034	3.4	6	28	66
DH450035	3.5	6	28	66
DH450036	3.6	6	28	66
DH450037	3.7	6	28	66
DH450038	3.8	6	36	74
DH450039	3.9	6	36	74
DH450040	4.0	6	36	74
DH450041	4.1	6	36	74
DH450042	4.2	6	36	74
DH450043	4.3	6	36	74
DH450044	4.4	6	36	74
DH450046	4.6	6	36	74
DH450047	4.7	6	36	74
DH450048	4.8	6	44	82
DH450049	4.9	6	44	82
DH450050	5.0	6	44	82
DH450051	5.1	6	44	82
DH450052	5.2	6	44	82
DH450053	5.3	6	44	82
DH450054	5.4	6	44	82
DH450055	5.5	6	44	82
DH450056	5.6	6	44	82

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH450057	5.7	6	44	82
DH450058	5.8	6	44	82
DH450059	5.9	6	44	82
DH450060	6.0	6	44	82
DH450061	6.1	8	53	91
DH450062	6.2	8	53	91
DH450063	6.3	8	53	91
DH450064	6.4	8	53	91
DH450065	6.5	8	53	91
DH450066	6.6	8	53	91
DH450067	6.7	8	53	91
DH450068	6.8	8	53	91
DH450069	6.9	8	53	91
DH450070	7.0	8	53	91
DH450073	7.3	8	53	91
DH450074	7.4	8	53	91
DH450075	7.5	8	53	91
DH450076	7.6	8	53	91
DH450077	7.7	8	53	91
DH450078	7.8	8	53	91
DH450079	7.9	8	53	91
DH450080	8.0	8	53	91
DH450081	8.1	10	61	103
DH450082	8.2	10	61	103
DH450083	8.3	10	61	103
DH450084	8.4	10	61	103

▶ Other diameters and shank types are available upon request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○	○	◎	○	○	○			○			◎	○				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○																			

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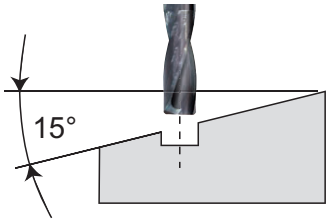
DREAM DRILLS - FLAT BOTTOM

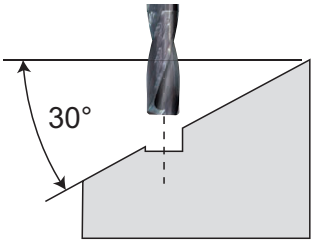
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

DPP447 SERIES without COOLANT HOLES (2XD)

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1	Non-alloy steel	80	RPM	8490	6370	5090	4240	3180	2550	2120	1590	1270
				FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.08-0.14	0.11-0.17	0.11-0.21	0.18-0.28	0.28-0.38
	2		80	RPM	8490	6370	5090	4240	3180	2550	2120	1590	1270
				FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.08-0.14	0.11-0.17	0.11-0.21	0.18-0.28	0.28-0.38
	3		70	RPM	7430	5570	4460	3710	2790	2230	1860	1390	1110
				FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34
	4		40	RPM	4240	3180	2550	2120	1590	1270	1060	800	640
				FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34
	5		38	RPM	4030	3020	2420	2020	1510	1210	1010	760	600
				FEED	0.02-0.05	0.02-0.06	0.03-0.08	0.03-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.21-0.31
	6	Low alloy steel	45	RPM	4770	3580	2860	2390	1790	1430	1190	900	720
				FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34
	7		40	RPM	4240	3180	2550	2120	1590	1270	1060	800	640
				FEED	0.02-0.05	0.03-0.07	0.03-0.08	0.04-0.10	0.07-0.13	0.11-0.17	0.11-0.21	0.18-0.28	0.24-0.34
	8		38	RPM	4030	3020	2420	2020	1510	1210	1010	760	600
				FEED	0.02-0.05	0.02-0.06	0.03-0.08	0.03-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.21-0.31
	9		25	RPM	2650	1990	1590	1330	990	800	660	500	400
				FEED	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.08	0.05-0.10	0.06-0.12	0.06-0.16	0.10-0.20
M	12	Stainless steel	30	RPM	3180	2390	1910	1590	1190	950	800	600	480
				FEED	0.01-0.03	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.08	0.05-0.10	0.06-0.12	0.09-0.15
K	15	Grey cast iron	70	RPM	7430	5570	4460	3710	2790	2230	1860	1390	1110
				FEED	0.02-0.05	0.02-0.06	0.03-0.08	0.03-0.09	0.06-0.12	0.09-0.15	0.08-0.18	0.14-0.24	0.20-0.30
	16		60	RPM	6370	4770	3820	3180	2390	1910	1590	1190	950
				FEED	0.02-0.05	0.02-0.05	0.03-0.06	0.03-0.07	0.04-0.10	0.07-0.13	0.06-0.16	0.11-0.21	0.15-0.25
N	21	Aluminum-wrought alloy	165	RPM	17510	13130	10500	8750	6570	5250	4380	3280	2630
				FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40
	22		165	RPM	17510	13130	10500	8750	6570	5250	4380	3280	2630
				FEED	0.02-0.05	0.04-0.08	0.04-0.10	0.06-0.12	0.10-0.16	0.14-0.20	0.14-0.24	0.22-0.32	0.30-0.40

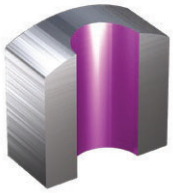


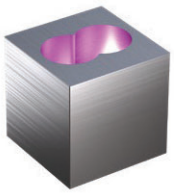


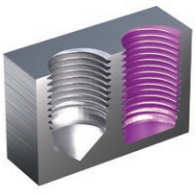
Surface Angle	Cutting Conditions RPM	FEED
0° - 15°	100%	100%
15° - 30°	100%	50%
30° -	70%	30%

- ▶The cutting conditions are for 2xD.
- ▶The rigid and precise machine and holder are required.
- ▶The recommended depth of hole is measured from the highest point of the hole on drilling in inclined and angled surfaces.
- ▶The recommended cutting conditions are those for drilling on flat and horizontal surfaces.
- ▶Please adjust feed rate according to the above surface angle when drilling on an inclined surface.
  - The recommended feed rate 50% or lower, in case of 15°-30° of the incline angle.
  - The recommended feed rate 30% or lower and RPM 70%, in case of 30° - of the incline angle.
- ▶Please decrease cutting speed as material hardness increases.
- ▶Only use drilling tool. Side milling, traversing, helical milling are not usable.

VARIETY OF DRILLING

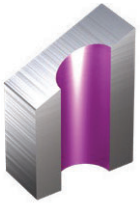

Curved Surface

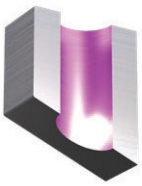

Chained Hole


Blind Hole for Threading

Guide Drilling

Cross Drilling


Inclined Entry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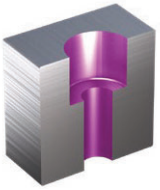
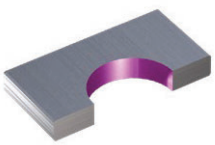
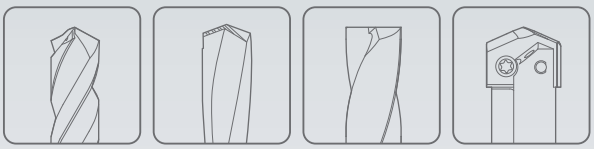

Counter Boring


Thin Plate

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

SOLID CARBIDE

DREAM DRILLS -INOX

DREAM DRILLS - INOX

- **For Tough Materials like Stainless Steels**
- **Für schwierig zerspanbare Materialien wie Edelstahl**

SELECTION GUIDE

YG HOLEMAKING TOOLS

SOLID CARBIDE DREAM DRILLS INOX

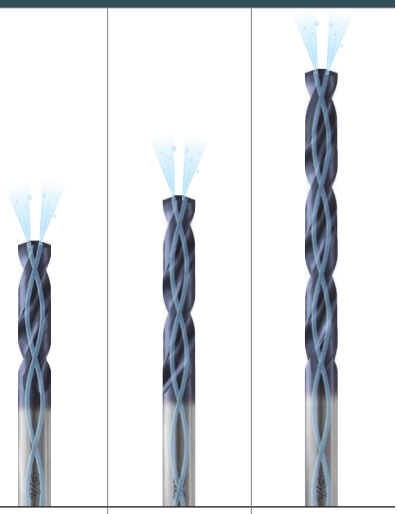
For Tough Materials like Stainless Steels

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A144

SERIES	DH451	DH452	DH453
DRILLING DEPTH	3XD	5XD	8XD
LENGTH	SHORT	LONG	EXTRA LONG
SIZE MIN	D3.0	D1.0	D3.0
SIZE MAX	D20.0	D20.0	D14.0
PAGE	A137	A139	A142
SURFACE TREATMENT	TiAlN		



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DH451	DH452	DH453
P	1	Non-alloy steel	About 0.15% C	Annealed	125				
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○
	4		About 0.75% C	Annealed	270	28			
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	○	○	○
	8			Quenched & Tempered	300	32			
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15			
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10			
	16		Pearlitic (Martensitic)		260	26			
	17	Nodular cast iron	Ferritic		160	3			
	18		Pearlitic		250	25			
	19	Malleable cast iron	Ferritic		130				
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎	◎
	22		Curable	Hardened	100		◎	◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○	○
	25		> 12% Si, Not Curable		130		○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	○
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

DREAM DRILLS - INOX

DH451 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

SHORT

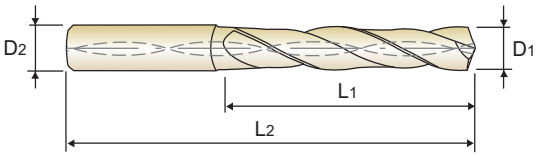
VOLLHARTMETALL DREAM SPIRALBOHRER - INOX mit KÜHLKANAL — *KURZ*

Forets DREAM DRILLS carbure pour INOX, avec arrosage central, série courte — *COURTE*

PUNTE ELICOIDALI IN MD, DREAM DRILLS - INOX (con fori di refrigerazione) — *CORTA*

- ▶Special flute shape and geometry suitable for machining stainless steel
- ▶Excellent chip evacuation from better surface treatment
- ▶Point R-thinning achieves superior centering and chip curling
- ▶TiAlN coating for better surface finishes and longer tool life

- ▶ Spezielle Nutenform und Geometrie für die Bearbeitung von rostfreiem Stahl
- ▶ Hervorragende Spanabfuhr durch bessere Oberflächenbehandlung
- ▶ Vorzügliche Zentrierung und Spanbruch durch die R-Ausspitzung
- ▶ TiAlN-Beschichtung für bessere Oberflächengüte der Bohrung und längere Standzeit



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p.A144

3 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH451080	8.0	8	41	79
DH451081	8.1	10	47	89
DH451082	8.2	10	47	89
DH451083	8.3	10	47	89
DH451085	8.5	10	47	89
DH451086	8.6	10	47	89
DH451087	8.7	10	47	89
DH451088	8.8	10	47	89
DH451089	8.9	10	47	89
DH451090	9.0	10	47	89
DH451091	9.1	10	47	89
DH451092	9.2	10	47	89
DH451093	9.3	10	47	89
DH451094	9.4	10	47	89
DH451095	9.5	10	47	89
DH451096	9.6	10	47	89
DH451097	9.7	10	47	89
DH451098	9.8	10	47	89
DH451099	9.9	10	47	89
DH451100	10.0	10	47	89
DH451101	10.1	12	55	102
DH451102	10.2	12	55	102
DH451103	10.3	12	55	102
DH451104	10.4	12	55	102
DH451105	10.5	12	55	102
DH451106	10.6	12	55	102
DH451107	10.7	12	55	102

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH451108	10.8	12	55	102
DH451109	10.9	12	55	102
DH451110	11.0	12	55	102
DH451111	11.1	12	55	102
DH451113	11.3	12	55	102
DH451114	11.4	12	55	102
DH451115	11.5	12	55	102
DH451117	11.7	12	55	102
DH451118	11.8	12	55	102
DH451119	11.9	12	55	102
DH451120	12.0	12	55	102
DH451125	12.5	14	60	107
DH451130	13.0	14	60	107
DH451135	13.5	14	60	107
DH451140	14.0	14	60	107
DH451145	14.5	16	65	115
DH451150	15.0	16	65	115
DH451155	15.5	16	65	115
DH451160	16.0	16	65	115
DH451165	16.5	18	73	123
DH451170	17.0	18	73	123
DH451175	17.5	18	73	123
DH451180	18.0	18	73	123
DH451185	18.5	20	79	131
DH451190	19.0	20	79	131
DH451195	19.5	20	79	131
DH451200	20.0	20	79	131

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	○			◎	○					◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	○	○	○												○				

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DREAM DRILLS - INOX

DH452 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

LONG

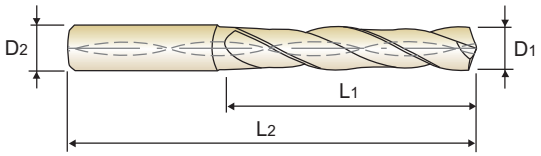
VOLLHARTMETALL DREAM SPIRALBOHRER - INOX mit KÜHLKANAL — *LANG*

Forets DREAM DRILLS carbure pour INOX, avec arrosage central, série longue — *LONGUE*

PUNTE ELICOIDALI IN MD, DREAM DRILLS - INOX (con fori di refrigerazione) — *LUNGA*

- ▶Special flute shape and geometry suitable for machining stainless steel
- ▶Excellent chip evacuation from better surface treatment
- ▶Point R-thinning achieves superior centering and chip curling
- ▶TiAlN coating for better surface finishes and longer tool life

- ▶ Spezielle Nutenform und Geometrie für die Bearbeitung von rostfreiem Stahl
- ▶ Hervorragende Spanabfuhr durch bessere Oberflächenbehandlung
- ▶ Vorzügliche Zentrierung und Spanbruch durch die R-Ausspitzung
- ▶ TiAlN-Beschichtung für bessere Oberflächengüte der Bohrung und längere Standzeit



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p.A144

5 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH452058	5.8	6	44	82
DH452059	5.9	6	44	82
DH452060	6.0	6	44	82
DH452061	6.1	8	53	91
DH452062	6.2	8	53	91
DH452063	6.3	8	53	91
DH452064	6.4	8	53	91
DH452065	6.5	8	53	91
DH452066	6.6	8	53	91
DH452067	6.7	8	53	91
DH452068	6.8	8	53	91
DH452069	6.9	8	53	91
DH452070	7.0	8	53	91
DH452071	7.1	8	53	91
DH452072	7.2	8	53	91
DH452073	7.3	8	53	91
DH452074	7.4	8	53	91
DH452075	7.5	8	53	91
DH452076	7.6	8	53	91
DH452077	7.7	8	53	91
DH452078	7.8	8	53	91
DH452079	7.9	8	53	91
DH452080	8.0	8	53	91
DH452081	8.1	10	61	103

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH452082	8.2	10	61	103
DH452083	8.3	10	61	103
DH452084	8.4	10	61	103
DH452085	8.5	10	61	103
DH452086	8.6	10	61	103
DH452087	8.7	10	61	103
DH452088	8.8	10	61	103
DH452089	8.9	10	61	103
DH452090	9.0	10	61	103
DH452091	9.1	10	61	103
DH452092	9.2	10	61	103
DH452093	9.3	10	61	103
DH452094	9.4	10	61	103
DH452095	9.5	10	61	103
DH452096	9.6	10	61	103
DH452097	9.7	10	61	103
DH452098	9.8	10	61	103
DH452099	9.9	10	61	103
DH452100	10.0	10	61	103
DH452101	10.1	12	71	118
DH452102	10.2	12	71	118
DH452103	10.3	12	71	118
DH452104	10.4	12	71	118
DH452105	10.5	12	71	118

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	○			◎	○					◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	○	○	○												○				

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DREAM DRILLS - INOX

DH453 SERIES

CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

EXTRA LONG

VOLLHARTMETALL DREAM SPIRALBOHRER - INOX mit KÜHLKANAL — *ÜBERLANG*

Forets DREAM DRILLS carbure pour INOX, avec arrosage central, série extra-longue — *EXTRA-LONGUE*

PUNTE ELICOIDALI IN MD, DREAM DRILLS - INOX (con fori di refrigerazione) — *EXTRA LUNGA*

- ▶Special flute shape and geometry suitable for machining stainless steel
- ▶Excellent chip evacuation from better surface treatment
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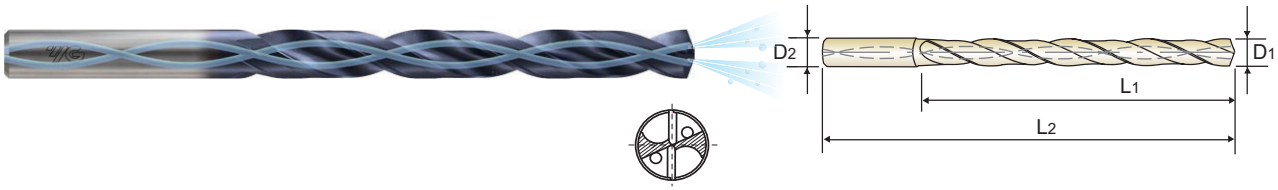
- ▶ Vorzügliche Zentrierung und Spanbruch durch die R-Ausspitzung
- ▶ TiAlN-Beschichtung für bessere Oberflächengüte der Bohrung und längere Standzeit



DIN 6537 | CARBIDE | 30° | h6 | m7 | 140° | 20 bar | TiAlN

p.A144

8 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH453030	3.0	6	34	72
DH453031	3.1	6	34	72
DH453032	3.2	6	34	72
DH453033	3.3	6	34	72
DH453034	3.4	6	34	72
DH453035	3.5	6	34	72
DH453036	3.6	6	34	72
DH453037	3.7	6	34	72
DH453038	3.8	6	43	81
DH453039	3.9	6	43	81
DH453040	4.0	6	43	81
DH453041	4.1	6	43	81
DH453042	4.2	6	43	81
DH453044	4.4	6	43	81
DH453045	4.5	6	43	81
DH453046	4.6	6	43	81
DH453047	4.7	6	43	81
DH453048	4.8	6	57	95
DH453049	4.9	6	57	95
DH453050	5.0	6	57	95
DH453051	5.1	6	57	95
DH453052	5.2	6	57	95
DH453053	5.3	6	57	95
DH453054	5.4	6	57	95

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DH453055	5.5	6	57	95
DH453056	5.6	6	57	95
DH453057	5.7	6	57	95
DH453058	5.8	6	57	95
DH453059	5.9	6	57	95
DH453060	6.0	6	57	95
DH453061	6.1	8	76	114
DH453062	6.2	8	76	114
DH453063	6.3	8	76	114
DH453064	6.4	8	76	114
DH453065	6.5	8	76	114
DH453066	6.6	8	76	114
DH453067	6.7	8	76	114
DH453068	6.8	8	76	114
DH453069	6.9	8	76	114
DH453070	7.0	8	76	114
DH453071	7.1	8	76	114
DH453072	7.2	8	76	114
DH453073	7.3	8	76	114
DH453074	7.4	8	76	114
DH453075	7.5	8	76	114
DH453076	7.6	8	76	114
DH453077	7.7	8	76	114
DH453078	7.8	8	76	114

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	○			◎	○					◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	○	○	○												○				

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DREAM DRILLS - INOX

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

DH451, DH452, DH453 SERIES with COOLANT HOLES

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 1.0	2.0
P	2	Non-alloy steel	70	RPM	22280	11140
				FEED	0.02-0.04	0.04-0.06
	3		70	RPM	22280	11140
				FEED	0.02-0.04	0.04-0.06
	6	Low alloy steel	70	RPM	22280	11140
				FEED	0.02-0.04	0.04-0.06
	7		50	RPM	15920	7960
				FEED	0.02-0.04	0.04-0.06
M	12	Stainless steel	40	RPM	12730	6370
				FEED	0.02-0.04	0.02-0.04
	13		25	RPM	7960	3980
				FEED	0.02-0.04	0.02-0.04
	14		45	RPM	14320	7160
				FEED	0.02-0.04	0.02-0.04
N	21	Aluminum-wrought alloy	130	RPM	41380	20690
				FEED	0.04-0.10	0.08-0.14
	22		130	RPM	41380	20690
				FEED	0.04-0.10	0.08-0.14
	23	Aluminum-cast, alloyed	110	RPM	35010	17510
				FEED	0.04-0.10	0.08-0.14
	24		110	RPM	35010	17510
				FEED	0.04-0.10	0.08-0.14
	25		90	RPM	28650	14320
				FEED	0.04-0.08	0.06-0.10
S	37	Titanium Alloys	25	RPM	7960	3980
				FEED	0.01-0.03	0.01-0.03

Vc	Parameter	Drill Diameter (mm) 3.0	4.0	5.0	6.0
100	RPM	10610	7960	6370	5310
	FEED	0.04-0.10	0.06-0.12	0.12-0.18	0.14-0.20
100	RPM	10610	7960	6370	5310
	FEED	0.04-0.10	0.06-0.12	0.12-0.18	0.14-0.20
100	RPM	10610	7960	6370	5310
	FEED	0.04-0.10	0.06-0.12	0.12-0.18	0.14-0.20
70	RPM	7430	5570	4460	3710
	FEED	0.04-0.10	0.06-0.12	0.12-0.18	0.14-0.20
50	RPM	5310	3980	3180	2650
	FEED	0.03-0.05	0.05-0.09	0.07-0.11	0.08-0.12
40	RPM	4240	3180	2550	2120
	FEED	0.03-0.05	0.05-0.09	0.07-0.11	0.08-0.12
60	RPM	6370	4770	3820	3180
	FEED	0.04-0.06	0.06-0.10	0.08-0.12	0.09-0.13
200	RPM	21220	15920	12730	10,610
	FEED	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28
200	RPM	21220	15920	12730	10610
	FEED	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28
180	RPM	19100	14,320	11460	9550
	FEED	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28
180	RPM	19100	14320	11460	9550
	FEED	0.14-0.20	0.19-0.25	0.20-0.26	0.22-0.28
150	RPM	15920	11940	9550	7960
	FEED	0.12-0.18	0.16-0.22	0.17-0.23	0.19-0.25
40	RPM	4240	3180	2550	2120
	FEED	0.02-0.04	0.04-0.08	0.06-0.10	0.07-0.11

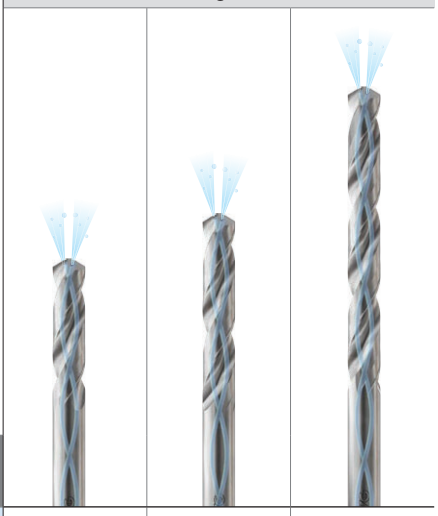
ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm) 8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	2	Non-alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.39	0.23-0.31	0.26-0.36	0.28-0.38
	3		100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.39	0.23-0.31	0.26-0.36	0.28-0.38
	6	Low alloy steel	100	RPM	3980	3180	2650	2270	1990	1770	1590
				FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.39	0.23-0.31	0.26-0.36	0.28-0.38
	7		70	RPM	2790	2230	1860	1590	1390	1240	1110
				FEED	0.16-0.22	0.18-0.24	0.19-0.27	0.21-0.39	0.23-0.31	0.26-0.36	0.28-0.38
M	12	Stainless steel	50	RPM	1990	1590	1330	1140	990	880	800
				FEED	0.09-0.13	0.10-0.15	0.11-0.16	0.12-0.17	0.13-0.18	0.14-0.19	0.15-0.20
	13		40	RPM	1590	1270	1060	910	800	710	640
				FEED	0.09-0.13	0.10-0.15	0.11-0.16	0.12-0.17	0.13-0.18	0.14-0.19	0.15-0.20
	14		60	RPM	2390	1910	1590	1360	1190	1060	950
				FEED	0.10-0.14	0.11-0.16	0.12-0.17	0.13-0.18	0.14-0.19	0.15-0.20	0.16-0.21
N	21	Aluminum-wrought alloy	200	RPM	7960	6370	5310	4550	3980	3540	3180
				FEED	0.24-0.30	0.26-0.32	0.28-0.34	0.30-0.36	0.32-0.38	0.33-0.43	0.35-0.45
	22		200	RPM	7960	6370	5310	4550	3980	3540	3180
				FEED	0.24-0.30	0.26-0.32	0.28-0.34	0.30-0.36	0.32-0.38	0.33-0.43	0.35-0.45
	23	Aluminum-cast, alloyed	180	RPM	7160	5730	4770	4090	3580	3180	2860
				FEED	0.24-0.30	0.26-0.32	0.28-0.34	0.30-0.36	0.32-0.38	0.33-0.43	0.35-0.45
	24		180	RPM	7160	5730	4770	4090	3580	3180	2860
				FEED	0.24-0.30	0.26-0.32	0.28-0.34	0.30-0.36	0.32-0.38	0.33-0.43	0.35-0.45
	25		150	RPM	5970	4770	3980	3410	2980	2650	2390
				FEED	0.21-0.27	0.23-0.29	0.25-0.31	0.27-0.33	0.28-0.34	0.28-0.38	0.30-0.40
S	37	Titanium Alloys	40	RPM	1590	1270	1060	910	800	710	640
				FEED	0.08-0.12	0.09-0.14	0.10-0.15	0.11-0.16	0.12-0.17	0.13-0.18	0.14-0.19

▶ Recommend to reduce the feed rate as following
Feed 100% : DH451(3xD), DH452(5xD) **Feed 85%** : DH453(8xD)

SERIES	D5432	D5433	D5434
DRILLING DEPTH	3XD	5XD	8XD
LENGTH	SHORT	LONG	EXTRA LONG
SIZE MIN	D3.0	D3.0	D3.0
SIZE MAX	D20.0	D20.0	D14.0
PAGE	A148	A151	A153
SURFACE TREATMENT	Bright		

SOLID CARBIDE
DREAM DRILLS ALU

For Aluminum and Aluminum Alloys



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◎ : Excellent ○ : Good

Recommended cutting conditions : p.A155

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	D5432	D5433	D5434
P	1	Non-alloy steel	About 0.15% C	Annealed	125				
	2		About 0.45% C	Annealed	190	13			
	3		About 0.45% C	Quenched & Tempered	250	25			
	4		About 0.75% C	Annealed	270	28			
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10			
	7			Quenched & Tempered	275	29			
	8			Quenched & Tempered	300	32			
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15			
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10			
	16		Pearlitic (Martensitic)		260	26			
	17	Nodular cast iron	Ferritic		160	3			
	18		Pearlitic		250	25			
	19	Malleable cast iron	Ferritic		130				
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎	◎
	22		Curable	Hardened	100		◎	◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎	◎
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

DREAM DRILLS - ALU

D5432 SERIES

CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

SHORT

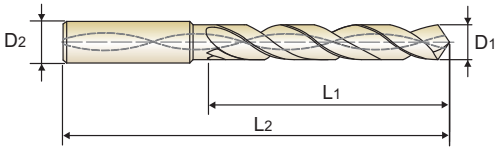
VOLLHARTMETALL DREAM SPIRALBOHRER - ALU mit KÜHLKANAL — KURZ

Forets DREAM DRILLS carbure pour ALU, avec arrosage central, série courte — COURTE

PUNTE ELICOIDALI IN MD, DREAM DRILLS - ALU (con fori di refrigerazione) — CORTA

- Optimized thinning for Aluminum & Aluminum Alloys to prevent any clogging from chip welding
- Wider and deeper flute gullets for maximum chip removal
- Special geometry and smooth coating reduces built up edge and improves finishes

- Optimierte Ausspitzung für Aluminum & Aluminumlegierungen zur Vermeidung von Verstopfungen durch das Aufschweißen der Späne
- Breitere und tiefere Spannuten für maximale Spanabfuhr
- Spezielle Geometrie und glatte Beschichtung reduzieren Aufbauschneidenbildung und verbessern die Oberflächen



DIN 6537 | CARBIDE | 30° | h6 | m7 | 118° | 20 bar | Bright

p.A155

3 × D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
D5432030	3.0	6	20	62
D5432031	3.1	6	20	62
D5432032	3.2	6	20	62
D5432033	3.3	6	20	62
D5432034	3.4	6	20	62
D5432035	3.5	6	20	62
D5432037	3.7	6	20	62
D5432038	3.8	6	24	66
D5432039	3.9	6	24	66
D5432040	4.0	6	24	66
D5432041	4.1	6	24	66
D5432042	4.2	6	24	66
D5432043	4.3	6	24	66
D5432045	4.5	6	24	66
D5432046	4.6	6	24	66
D5432047	4.7	6	24	66
D5432048	4.8	6	28	66
D5432049	4.9	6	28	66
D5432050	5.0	6	28	66
D5432051	5.1	6	28	66
D5432053	5.3	6	28	66

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
D5432054	5.4	6	28	66
D5432055	5.5	6	28	66
D5432056	5.6	6	28	66
D5432057	5.7	6	28	66
D5432058	5.8	6	28	66
D5432059	5.9	6	28	66
D5432060	6.0	6	28	66
D5432061	6.1	8	34	79
D5432062	6.2	8	34	79
D5432063	6.3	8	34	79
D5432064	6.4	8	34	79
D5432065	6.5	8	34	79
D5432066	6.6	8	34	79
D5432067	6.7	8	34	79
D5432068	6.8	8	34	79
D5432069	6.9	8	34	79
D5432070	7.0	8	34	79
D5432072	7.2	8	41	79
D5432073	7.3	8	41	79
D5432074	7.4	8	41	79
D5432075	7.5	8	41	79
D5432076	7.6	8	41	79
D5432077	7.7	8	41	79

- DLC coating is available on your request.
- Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	

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DREAM DRILLS - ALU

D5432 SERIES

CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

SHORT

VOLLHARTMETALL DREAM SPIRALBOHRER - ALU mit KÜHLKANAL — *KURZ*

Forets DREAM DRILLS carbure pour ALU, avec arrosage central, série courte — *COURTE*

PUNTE ELICOIDALI IN MD, DREAM DRILLS - ALU (con fori di refrigerazione) — *CORTA*

- Optimized thinning for Aluminum & Aluminum Alloys to prevent any clogging from chip welding
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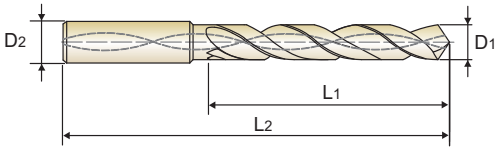

DIN 6537 | CARBIDE | 30° | h6 | m7 | 118° | 20 bar | Bright

p.A155

3 × D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
D5432150	15.0	16	65	115
D5432155	15.5	16	65	115
D5432160	16.0	16	65	115
D5432165	16.5	18	73	123
D5432170	17.0	18	73	123
D5432175	17.5	18	73	123
D5432180	18.0	18	73	123
D5432185	18.5	20	79	131

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
D5432190	19.0	20	79	131
D5432200	20.0	20	79	131

- DLC coating is available on your request.
- Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	

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DREAM DRILLS - ALU

D5433 SERIES

CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

LONG

VOLLHARTMETALL DREAM SPIRALBOHRER - ALU mit KÜHLKANAL — *LANG*

Forets DREAM DRILLS carbure pour ALU, avec arrosage central, série longue — *LONGUE*

PUNTE ELICOIDALI IN MD, DREAM DRILLS - ALU (CON FORI DI REFRIGERAZIONE) — *LUNGA*

- Optimized thinning for Aluminum & Aluminum Alloys to prevent any clogging from chip welding
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- Breitere und tiefere Spannuten für maximale Spanabfuhr
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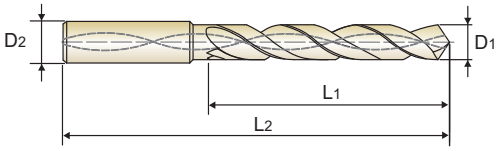


DIN 6537 | CARBIDE | 30° | h6 | m7 | 118° | 20 bar | Bright

p.A155

5 × D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
D5433079	7.9	8	53	91
D5433080	8.0	8	53	91
D5433081	8.1	10	61	103
D5433082	8.2	10	61	103
D5433083	8.3	10	61	103
D5433084	8.4	10	61	103
D5433085	8.5	10	61	103
D5433086	8.6	10	61	103
D5433087	8.7	10	61	103
D5433088	8.8	10	61	103
D5433089	8.9	10	61	103
D5433090	9.0	10	61	103
D5433091	9.1	10	61	103
D5433092	9.2	10	61	103
D5433093	9.3	10	61	103
D5433095	9.5	10	61	103
D5433096	9.6	10	61	103
D5433097	9.7	10	61	103
D5433098	9.8	10	61	103
D5433099	9.9	10	61	103
D5433100	10.0	10	61	103
D5433101	10.1	12	71	118
D5433102	10.2	12	71	118
D5433103	10.3	12	71	118
D5433104	10.4	12	71	118
D5433105	10.5	12	71	118

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
D5433106	10.6	12	71	118
D5433107	10.7	12	71	118
D5433108	10.8	12	71	118
D5433110	11.0	12	71	118
D5433111	11.1	12	71	118
D5433112	11.2	12	71	118
D5433114	11.4	12	71	118
D5433115	11.5	12	71	118
D5433116	11.6	12	71	118
D5433117	11.7	12	71	118
D5433118	11.8	12	71	118
D5433119	11.9	12	71	118
D5433120	12.0	12	71	118
D5433125	12.5	14	77	124
D5433130	13.0	14	77	124
D5433135	13.5	14	77	124
D5433140	14.0	14	77	124
D5433145	14.5	16	83	133
D5433150	15.0	16	83	133
D5433155	15.5	16	83	133
D5433160	16.0	16	83	133
D5433165	16.5	18	93	143
D5433180	18.0	18	93	143
D5433190	19.0	20	101	153
D5433195	19.5	20	101	153
D5433200	20.0	20	101	153

- DLC coating is available on your request.
- Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	

DREAM DRILLS - ALU

D5434 SERIES

CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

EXTRA LONG

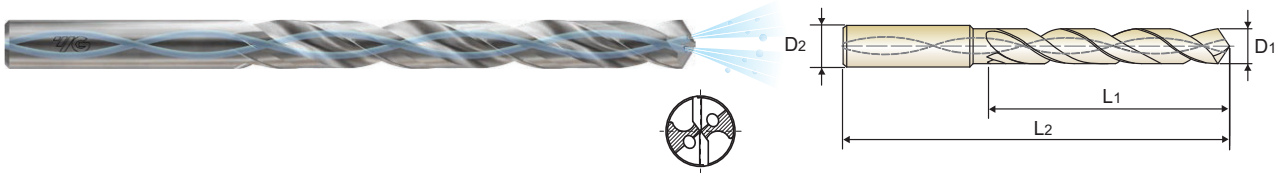
VOLLHARTMETALL DREAM SPIRALBOHRER - ALU mit KÜHLKANAL — *ÜBERLANG*

Forets DREAM DRILLS carbure pour ALU, avec arrosage central, série extra-longue — *EXTRA-LONGUE*

PUNTE ELICOIDALI IN MD, DREAM DRILLS - ALU (con fori di refrigerazione) — *EXTRA LUNGA*

- Optimized thinning for Aluminum & Aluminum Alloys to prevent any clogging from chip welding
- Wider and deeper flute gullets for maximum chip removal
- Special geometry and smooth coating reduces built up edge and improves finishes

- Optimierte Ausspitzung für Aluminum & Aluminumlegierungen zur Vermeidung von Verstopfungen durch das Aufschweißen der Späne
- Breitere und tiefere Spannuten für maximale Spanabfuhr
- Spezielle Geometrie und glatte Beschichtung reduzieren Aufbauschneidenbildung und verbessern die Oberflächen



DIN 6537 | CARBIDE | 30° | h6 | m7 | 118° | 20 bar | Bright

p.A155

8 × D

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
D5434089	8.9	10	95	142
D5434090	9.0	10	95	142
D5434092	9.2	10	95	142
D5434093	9.3	10	95	142
D5434094	9.4	10	95	142
D5434095	9.5	10	95	142
D5434096	9.6	10	95	142
D5434099	9.9	10	95	142
D5434100	10.0	10	95	142
D5434101	10.1	12	114	162
D5434102	10.2	12	114	162
D5434103	10.3	12	114	162
D5434104	10.4	12	114	162
D5434105	10.5	12	114	162
D5434106	10.6	12	114	162
D5434107	10.7	12	114	162
D5434108	10.8	12	114	162
D5434109	10.9	12	114	162
D5434110	11.0	12	114	162
D5434111	11.1	12	114	162
D5434112	11.2	12	114	162
D5434113	11.3	12	114	162
D5434114	11.4	12	114	162
D5434115	11.5	12	114	162
D5434116	11.6	12	114	162

EDP No.	Drill Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
D5434117	11.7	12	114	162
D5434118	11.8	12	114	162
D5434119	11.9	12	114	162
D5434120	12.0	12	114	162
D5434125	12.5	14	133	178
D5434130	13.0	14	133	178
D5434135	13.5	14	133	178
D5434140	14.0	14	133	178

- DLC coating is available on your request.
- Other shank types are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	

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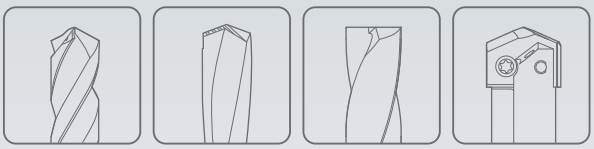
Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

SOLID CARBIDE

DREAM DRILLS - MQL TYPE

DREAM DRILLS - MQL TYPE

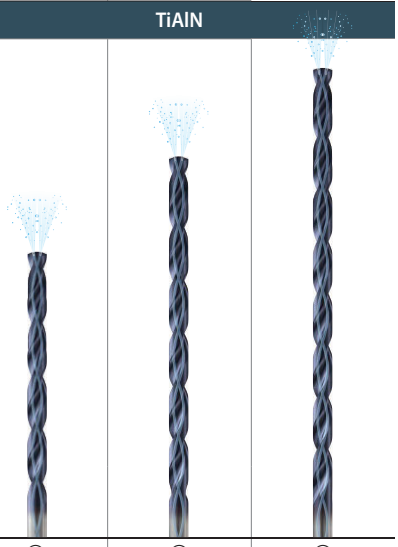
- Minimum Quantity Lubrication Drilling Deep Holes (10×D ~ 40×D)

- Minimalmengenschmierung Tieflochbohren (10×D ~ 40×D)

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	DH510	DH515	DH520
DRILLING DEPTH	10XD	15XD	20XD
LENGTH	EXTRA LONG	EXTRA LONG	EXTRA LONG
SIZE MIN	D3.0	D3.0	D3.0
SIZE MAX	D14.0	D12.0	D10.0
PAGE	A160	A161	
SURFACE TREATMENT	TiAlN		



SOLID CARBIDE
DREAM DRILLS
MQL TYPE

Minimum Quantity Lubrication
Drilling Deep Holes (10×D ~ 30×D)

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. A164

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DH510	DH515	DH520
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○
	4		About 0.75% C	Annealed	270	28			
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	○	○	○
	8			Quenched & Tempered	300	32	○	○	○
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○
	11			Quenched & Tempered	325	35	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○	○
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎
	18		Pearlitic		250	25	○	○	○
	19	Malleable cast iron	Ferritic		130		◎	◎	◎
	20		Pearlitic		230	21	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

DREAM DRILLS - MQL TYPE

DH510 SERIES

CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES

EXTRA LONG

VOLLHARTMETALL DREAM SPIRALBOHRER MQL - TYPE mit KÜHLKANAL in GERADZAHLIGER SCHAFTAUSFÜHRUNG

Forets DREAM DRILLS carbure Type MQL avec arrosage central, série extra-longue

PUNTE ELICOIDALI IN MD, DREAM DRILLS MQL (con fori di refrigerazione)

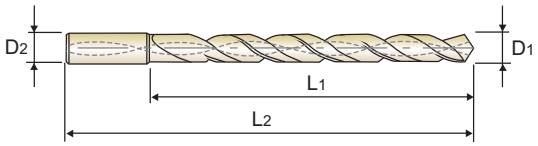
ÜBERLANG

EXTRA-LONGUE

EXTRA LUNGA

- 4-Facet Point for good centering capability
- Optimized special flutes are ideal for removing chips and for productive drilling
- Enhanced chip evacuation by polished flute upgraded TiAlN nano layer full coating
- MQL system compatible (Minimum Quantity Lubrication)

- 4-Facetten-Spitze für gute Zentrierfähigkeit
- Optimierte Spezialnuten für die ideale Spanabfuhr und zum produktiven Bohren
- Verbesserte Spanabfuhr durch hochglanzpolierte TiAlN-Nano-Vollbeschichtung
- MMS geeignet



CARBIDE | 30° | h6 | h7 | 140° | 20 bar | TiAlN

p.A164

10 × D

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH510030	3.0	3	39	90
DH510033	3.3	4	46	97
DH510035	3.5	4	46	97
DH510040	4.0	4	52	103
DH510042	4.2	5	59	112
DH510045	4.5	5	59	112
DH510050	5.0	5	65	118
DH510055	5.5	6	72	127
DH510060	6.0	6	78	133
DH510065	6.5	7	85	141
DH510068	6.8	7	91	147
DH510070	7.0	7	91	147
DH510075	7.5	8	98	155

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
DH510080	8.0	8	104	161
DH510085	8.5	9	111	169
DH510090	9.0	9	117	175
DH510095	9.5	10	124	182
DH510100	10.0	10	130	188
DH510105	10.5	11	137	201
DH510110	11.0	11	143	207
DH510115	11.5	12	150	215
DH510120	12.0	12	156	221
DH510125	12.5	13	163	229
DH510130	13.0	13	169	235
DH510135	13.5	14	176	243
DH510140	14.0	14	182	249

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○	○		○	○				◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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DREAM DRILLS - MQL TYPE

DHM10 SERIES | DHM15 SERIES | DHM20 SERIES

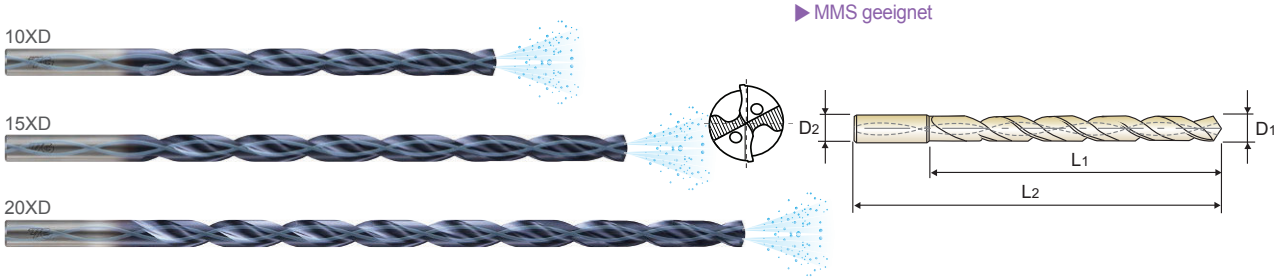
CARBIDE, DREAM DRILL MQL TYPE END MILL SHANK with COOLANT HOLE

EXTRA LONG
ÜBERLANG
EXTRA-LONGUE
EXTRA LUNGA

VOLLHARTMETALL DREAM SPIRALBOHRER MQL - TYPE MIT KÜHLKANAL
Forets DREAM DRILLS carbure Type MQL avec arrosage central, série extra-longue
PUNTE MD, DREAM DRILLS MQL GAMBO RINFORZATO (con fori di ferigerazione)

- 4-Facet Point for good centering capability
- Optimized special flutes are ideal for removing chips and for productive drilling
- Enhanced chip evacuation by polished flute upgraded TiAlN nano layer full coating
- MQL system compatible (Minimum Quantity Lubrication)

- 4-Facetten-Spitze für gute Zentrierfähigkeit
- Optimierte Spezialnuten für die ideale Spanabfuhr und zum produktiven Bohren
- Verbesserte Spanabfuhr durch hochglanzpolierte TiAlN-Nano-Vollbeschichtung
- MMS geeignet



DHM10 DHM15 DHM20

CARBIDE | 30° | h6 | h7 | 140° | 20 bar | 45 bar | TiAlN

p.A164

10 × D (DHM10) | 15 × D (DHM15) | 20 × D (DHM20)

DHM10

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DHM10030	3.0	6	40	80
DHM10033	3.3	6	47	87
DHM10035	3.5	6	47	87
DHM10040	4.0	6	53	93
DHM10042	4.2	6	60	100
DHM10045	4.5	6	60	100
DHM10050	5.0	6	66	106
DHM10055	5.5	6	73	113
DHM10060	6.0	6	79	119
DHM10065	6.5	8	86	126
DHM10068	6.8	8	92	132
DHM10070	7.0	8	92	132
DHM10075	7.5	8	99	139
DHM10080	8.0	8	105	145
DHM10085	8.5	10	112	156
DHM10090	9.0	10	118	162
DHM10095	9.5	10	126	170
DHM10100	10.0	10	132	176
DHM10105	10.5	12	139	188
DHM10110	11.0	12	145	194
DHM10115	11.5	12	152	201
DHM10120	12.0	12	158	207
DHM10125	12.5	14	165	214
DHM10130	13.0	14	171	220
DHM10135	13.5	14	178	227

DHM15

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DHM15030	3.0	6	55	95
DHM15035	3.5	6	64	104
DHM15040	4.0	6	73	113
DHM15045	4.5	6	82	122
DHM15050	5.0	6	91	131
DHM15055	5.5	6	100	140
DHM15060	6.0	6	109	149
DHM15070	7.0	8	127	167
DHM15080	8.0	8	145	185
DHM15090	9.0	10	163	207
DHM15100	10.0	10	182	226
DHM15110	11.0	12	200	249
DHM15120	12.0	12	218	267

DHM20

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
DHM20030	3.0	6	70	110
DHM20035	3.5	6	82	122
DHM20040	4.0	6	93	133
DHM20045	4.5	6	105	145
DHM20050	5.0	6	116	156
DHM20055	5.5	6	128	168
DHM20060	6.0	6	139	179
DHM20070	7.0	8	162	202
DHM20080	8.0	8	185	225
DHM20090	9.0	10	208	252
DHM20100	10.0	10	232	276
DHM20120	12.0	12	278	327

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○	○		○	○				◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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DREAM DRILLS - MQL TYPE

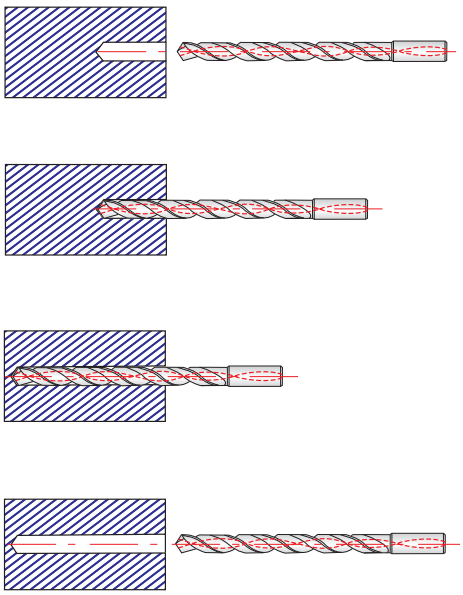
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

DH510, DH515, DH520, DHM10, DHM15, DHM20, DHM25, DHM30 SERIES

with COOLANT HOLES

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc 10xD-20xD	Vc 25xD-30xD	Parameter	Drill Diameter (mm) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0
P	1	Non-alloy steel	120	100	RPM(10xD-20xD)	12730	9550	7640	6370	4770	3820	3180	2730
					RPM(25xD-30xD)	10610	7960	6370	5310	3980	3180	2650	2270
					FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31
	2		100	80	RPM(10xD-20xD)	10610	7960	6370	5310	3980	3180	2650	2270
					RPM(25xD-30xD)	8490	6370	5090	4240	3180	2550	2120	1820
					FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31
	3		80	65	RPM(10xD-20xD)	8490	6370	5090	4240	3180	2550	2120	1820
					RPM(25xD-30xD)	6900	5170	4140	3450	2590	2070	1720	1480
					FEED	0.06-0.10	0.08-0.12	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26
	6	Low alloy steel	100	100	RPM(10xD-20xD)	10610	7960	6370	5310	3980	3180	2650	2270
					RPM(25xD-30xD)	10610	7960	6370	5310	3980	3180	2650	2270
					FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31
	7		70	60	RPM(10xD-20xD)	7430	5570	4460	3710	2790	2230	1860	1590
					RPM(25xD-30xD)	6370	4770	3820	3180	2390	1910	1590	1360
					FEED	0.06-0.10	0.08-0.12	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26
	8		55	50	RPM(10xD-20xD)	5840	4380	3500	2920	2190	1750	1460	1250
					RPM(25xD-30xD)	5310	3980	3180	2650	1990	1590	1330	1140
					FEED	0.06-0.10	0.08-0.12	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.26
	10	High alloyed steel, and tool steel	60	50	RPM(10xD-20xD)	6370	4770	3820	3180	2390	1910	1590	1360
					RPM(25xD-30xD)	5310	3980	3180	2650	1990	1590	1330	1140
					FEED	0.05-0.09	0.07-0.11	0.08-0.14	0.10-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24
	11		50	45	RPM(10xD-20xD)	5310	3980	3180	2650	1990	1590	1330	1140
					RPM(25xD-30xD)	4770	3580	2860	2390	1790	1430	1190	1020
					FEED	0.04-0.08	0.06-0.10	0.07-0.13	0.08-0.14	0.10-0.16	0.12-0.18	0.13-0.19	0.15-0.21
K	15	Grey cast iron	90	75	RPM(10xD-20xD)	9550	7160	5730	4770	3580	2860	2390	2050
					RPM(25xD-30xD)	7960	5970	4770	3980	2980	2390	1990	1710
					FEED	0.10-0.14	0.12-0.16	0.17-0.23	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.30-0.36
	16		70	60	RPM(10xD-20xD)	7430	5570	4460	3710	2790	2230	1860	1590
					RPM(25xD-30xD)	6370	4770	3820	3180	2390	1910	1590	1360
					FEED	0.10-0.14	0.12-0.16	0.17-0.23	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.30-0.36
	17	Nodular cast iron	100	80	RPM(10xD-20xD)	10610	7960	6370	5310	3980	3180	2650	2270
					RPM(25xD-30xD)	8490	6370	5090	4240	3180	2550	2120	1820
					FEED	0.10-0.14	0.12-0.16	0.17-0.23	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.30-0.36
	18		70	60	RPM(10xD-20xD)	7430	5570	4460	3710	2790	2230	1860	1590
					RPM(25xD-30xD)	6370	4770	3820	3180	2390	1910	1590	1360
					FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31
	19	Malleable cast iron	80	65	RPM(10xD-20xD)	8490	6370	5090	4240	3180	2550	2120	1820
					RPM(25xD-30xD)	6900	5170	4140	3450	2590	2070	1720	1480
					FEED	0.10-0.14	0.12-0.16	0.17-0.23	0.19-0.25	0.22-0.28	0.24-0.30	0.28-0.34	0.30-0.36
	20		70	55	RPM(10xD-20xD)	7430	5570	4460	3710	2790	2230	1860	1590
					RPM(25xD-30xD)	5840	4380	3500	2920	2190	1750	1460	1250
					FEED	0.08-0.12	0.10-0.14	0.12-0.18	0.14-0.20	0.18-0.24	0.20-0.26	0.22-0.26	0.25-0.31



1. Guide Drilling should be done as Diameter +0.01~+0.1mm between 3xD and 5xD depth.
2. For Main Drilling, proceed with low RPM at Guide Drilling segment.
   (RPM 300, FEED 400mm/min)
3. Just before the end of Guide Drilling segment, reduce feed to zero and increase the RPM according to Recommended Cutting Condition chart (See above).
4. After then, proceed main drilling by increasing feed without step drilling.
5. When coming out from Guide Drilling start point after drilling, RPM should be reduced as 300
   and feed should be 1000 mm/min.
6. When coming out from Guide Drilling segment to the outside, the feed should be decreased as 50%.

SERIES	DH500
DRILLING DEPTH	3XD
LENGTH	SHORT
SIZE MIN	D2.6
SIZE MAX	D14.0
PAGE	A167
SURFACE TREATMENT	TiAlN

SOLID CARBIDE
DREAM DRILLS for HIGH HARDENED STEELS

For High Hardened Steels (HRc50 to HRc70)

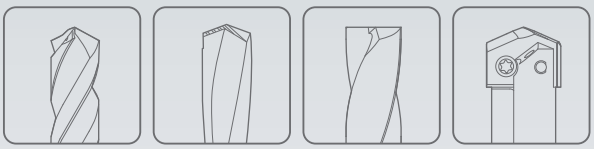
Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A167

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	
P	1	Non-alloy steel	About 0.15% C	Annealed	125		
	2		About 0.45% C	Annealed	190	13	
	3		About 0.45% C	Quenched & Tempered	250	25	
	4		About 0.75% C	Annealed	270	28	
	5		About 0.75% C	Quenched & Tempered	300	32	
	6	Low alloy steel		Annealed	180	10	
	7			Quenched & Tempered	275	29	
	8			Quenched & Tempered	300	32	
	9			Quenched & Tempered	350	38	
	10	High alloyed steel, and tool steel		Annealed	200	15	
	11			Quenched & Tempered	325	35	
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	
	13		Martensitic	Quenched & Tempered	240	23	
	14		Austenitic		180	10	
K	15	Grey cast iron	Pearlitic / ferritic		180	10	
	16		Pearlitic (Martensitic)		260	26	
	17	Nodular cast iron	Ferritic		160	3	
	18		Pearlitic		250	25	
	19	Malleable cast iron	Ferritic		130		
	20		Pearlitic		230	21	
N	21	Aluminum-wrought alloy	Not Curable		60		
	22		Curable	Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		
	24		≤ 12% Si, Curable	Hardened	90		
	25		> 12% Si, Not Curable		130		
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		
	27		CuZn, CuSnZn (Brass)		90		
	28		CuSn, lead-free copper and electrolytic copper		100		
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				
	30		Rubber, Wood, etc.				
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	
	32			Cured	280	30	
	33		Ni or Co Based	Annealed	250	25	
	34			Cured	350	38	
	35			Cast	320	34	
	36	Titanium Alloys	Pure Titanium		400 Rm		
	37		Alpha + Beta Alloys	Hardened	1050 Rm		
H	38	Hardened steel		Hardened	550	55	◎
	39.1			Hardened	630	60	◎
	39.3			Hardened		70	◎
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

SOLID CARBIDE

GENERAL CARBIDE DRILLS

UNIVERSELLE VHM - BOHRER

- For General Purpose, DIN 338 & DIN 6539
- Für allgemeine Anwendungen, DIN 338 & DIN 6539

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	D5405	D5407
STANDARD	DIN 6539	DIN 338
LENGTH	STUB	JOBBER
SIZE MIN	D1.0	D1.0
SIZE MAX	D13.0	D13.0
PAGE	A171	A173
SURFACE TREATMENT	Bright	

SOLID CARBIDE GENERAL CARBIDE DRILLS

For General Purpose, DIN 338 & DIN 6539

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A175

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	D5405	D5407
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎
	2		About 0.45% C	Annealed	190	13	○	○
	3		About 0.45% C	Quenched & Tempered	250	25		
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10	○	○
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎
	22		Curable	Hardened	100		◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

GENERAL CARBIDE DRILLS

D5405 SERIES

CARBIDE DRILLS

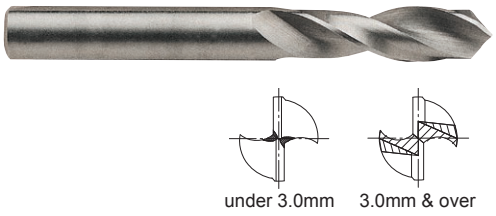
STUB

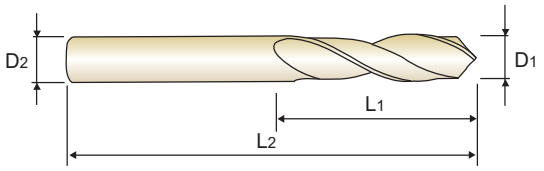
VOLLHARTMETALL-SPIRALBOHRER
Forets carbure, série extra-courte
PUNTE IN METALLO DURO

EXTRA KURZ
EXTRA-COURTE
EXTRA CORTA

▶**Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.

▶**Verwendung** : Zum wirtschaftlichen Bohren von Stahl allgemein, Stahlguß, Hart-und Temperguß, Nichteisen Leichtmetallen, abrasiven Kunststoffen.





DIN 6539 | CARBIDE | 30° | h6 | h7 | 118° | Bright

p.A175

$D_1 = D_2$

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D5405059	5.9	28	66
D5405060	6.0	28	66
D5405061	6.1	31	70
D5405062	6.2	31	70
D5405063	6.3	31	70
D5405064	6.4	31	70
D5405065	6.5	31	70
D5405066	6.6	31	70
D5405067	6.7	31	70
D5405068	6.8	34	74
D5405069	6.9	34	74
D5405070	7.0	34	74
D5405071	7.1	34	74
D5405072	7.2	34	74
D5405074	7.4	34	74
D5405075	7.5	34	74
D5405076	7.6	37	79
D5405077	7.7	37	79
D5405078	7.8	37	79
D5405079	7.9	37	79
D5405080	8.0	37	79
D5405081	8.1	37	79
D5405082	8.2	37	79

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D5405083	8.3	37	79
D5405084	8.4	37	79
D5405085	8.5	37	79
D5405086	8.6	40	84
D5405087	8.7	40	84
D5405088	8.8	40	84
D5405090	9.0	40	84
D5405091	9.1	40	84
D5405092	9.2	40	84
D5405093	9.3	40	84
D5405094	9.4	40	84
D5405095	9.5	40	84
D5405097	9.7	43	89
D5405098	9.8	43	89
D5405099	9.9	43	89
D5405100	10.0	43	89
D5405102	10.2	43	89
D5405105	10.5	43	89
D5405110	11.0	47	95
D5405115	11.5	47	95
D5405120	12.0	51	102
D5405130	13.0	51	102

▶ TiN(D6405), TiCN(DG405) and TiAlN(DH405) are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	○				○						○			○					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎												○					

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YG-1 CO., LTD.

GENERAL CARBIDE DRILLS

D5407 SERIES

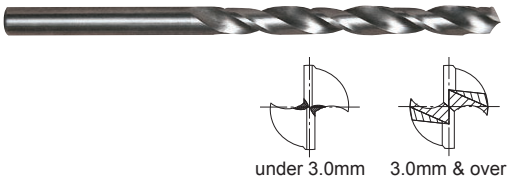
CARBIDE DRILLS

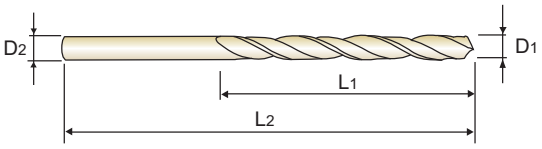
JOBBER

VOLLHARTMETALL-SPIRALBOHRER — **KURZ**
Forets carbure, série courte — **COURTE**
MPUNTE IN METALLO DURO — **CORTA**

▶**Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.

▶**Verwendung** : Zum wirtschaftlichen Bohren von Stahl allgemein, Stahlguß, Hart-und Temperguß, Nichteisen Leichtmetallen, abrasiven Kunststoffen.





DIN 338 | CARBIDE | 30° | h6 | h7 | 118° | Bright

p.A175

$D_1=D_2$

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D5407057	5.7	57	93
D5407058	5.8	57	93
D5407059	5.9	57	93
D5407060	6.0	57	93
D5407061	6.1	63	101
D5407062	6.2	63	101
D5407063	6.3	63	101
D5407064	6.4	63	101
D5407065	6.5	63	101
D5407068	6.8	69	109
D5407070	7.0	69	109
D5407075	7.5	69	109

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D5407080	8.0	75	117
D5407085	8.5	75	117
D5407090	9.0	81	125
D5407095	9.5	81	125
D5407100	10.0	87	133
D5407102	10.2	87	133
D5407105	10.5	87	133
D5407110	11.0	94	142
D5407115	11.5	94	142
D5407120	12.0	101	151
D5407130	13.0	101	151

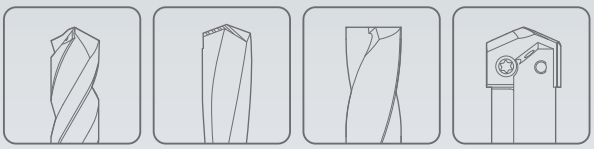
▶ TiN(D6407), TiCN(DG407) and TiAlN(DH407) are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	○				○						○			○					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎												○					

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

HSS-PM

MULTI-1 DRILLS

MULTI-1 BOHRER

- **Premium HSS-PM Drills**
  For Wide Range of Applications Particularly Stainless Steels and Titanium

- **HSS-PM Bohrer**
  Für ein breites Anwendungsspektrum, insbesondere Edelstahl und Titan

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	CDRA03	CDRA04
LENGTH	STUB	JOBBER
SIZE MIN	D1.0	D2.0
SIZE MAX	D13.0	D13.0
PAGE	A179	A182
SURFACE TREATMENT	TiAlN	

HSS-PM
MULTI-1 DRILLS

Premium HSS-PM Drills
for Wide Range of Applications Particularly Stainless Steels and Titanium

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A185

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	CDRA03	CDRA04
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	○	○
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29	○	○
	8			Quenched & Tempered	300	32	○	○
	9			Quenched & Tempered	350	38	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎
	22		Curable	Hardened	100		◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

MULTI-1 DRILLS

CDRA03 SERIES

HSS-PM, MULTI-1 DRILLS

STUB
EXTRA KURZ
EXTRA-COURTE
EXTRA CORTA

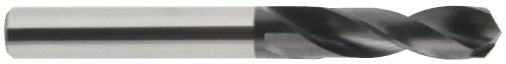
HSS-PM MULTI-1 BOHRER
Forets MULTI-1 HSS-PM Premium, série extra-courte
PUNTA GAMBO CILINDRICO MULTI-1, HSS-PM

▶**Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

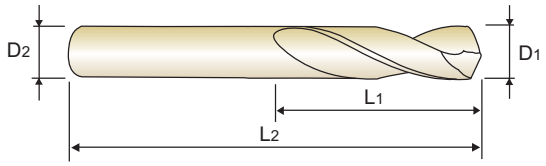
▶**Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.

▶**Anwendung** : Baustähle, Kohlenstoffstähle, legierte Stähle, vorgehärtete Stähle, Formstähle, rostfreie Stähle, gehärtete Stähle (HRc30~45), Gusseisen, Aluminiumlegierungen, Nichteisen Legierungen, Titan.

▶**Vorteile** : Maximale Selbstzentrierung durch besonderen Spitzenanschliff
Bohrergeometrie für optimale Spanabfuhr.
Premium Pulverstahl mit ausgezeichneter Zähigkeit.



up to 1.4mm over 1.4mm



HSS PM | 30° | h6 | h7 | 118° | 135° | TiAlN

up to 1.9mm over 1.9mm

p.A185

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03058	5.8	6	28	72
CDRA03059	5.9	6	28	72
CDRA03060	6.0	6	28	72
CDRA03061	6.1	8	31	75
CDRA03062	6.2	8	31	75
CDRA03063	6.3	8	31	75
CDRA03064	6.4	8	31	75
CDRA03065	6.5	8	31	75
CDRA03066	6.6	8	31	75
CDRA03067	6.7	8	31	75
CDRA03068	6.8	8	34	78
CDRA03069	6.9	8	34	78
CDRA03070	7.0	8	34	78
CDRA03071	7.1	8	34	78
CDRA03072	7.2	8	34	78
CDRA03073	7.3	8	34	78
CDRA03074	7.4	8	34	78
CDRA03075	7.5	8	34	78
CDRA03076	7.6	8	37	81
CDRA03077	7.7	8	37	81
CDRA03078	7.8	8	37	81
CDRA03079	7.9	8	37	81
CDRA03080	8.0	8	37	81
CDRA03081	8.1	10	37	87

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA03082	8.2	10	37	87
CDRA03083	8.3	10	37	87
CDRA03084	8.4	10	37	87
CDRA03085	8.5	10	37	87
CDRA03086	8.6	10	40	90
CDRA03087	8.7	10	40	90
CDRA03088	8.8	10	40	90
CDRA03089	8.9	10	40	90
CDRA03090	9.0	10	40	90
CDRA03092	9.2	10	40	90
CDRA03093	9.3	10	40	90
CDRA03094	9.4	10	40	90
CDRA03095	9.5	10	40	90
CDRA03096	9.6	10	43	93
CDRA03097	9.7	10	43	93
CDRA03098	9.8	10	43	93
CDRA03100	10.0	10	43	93
CDRA03101	10.1	12	43	100
CDRA03102	10.2	12	43	100
CDRA03103	10.3	12	43	100
CDRA03104	10.4	12	43	100
CDRA03105	10.5	12	43	100
CDRA03106	10.6	12	43	100
CDRA03107	10.7	12	47	104

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○	○	○			○		◎	○					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	○	○												○					

MULTI-1 DRILLS

CDRA04 SERIES

HSS-PM, MULTI-1 DRILLS

JOBBER

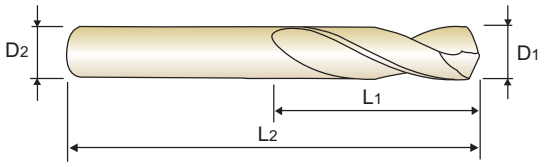
HSS-PM MULTI-1 BOHRER — *KURZ*
Forets MULTI-1 HSS-PM Premium, série courte — *COURTE*
PUNTA GAMBO CILINDRICO MULTI-1, HSS-PM — *CORTA*

▶**Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

▶**Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
Premium powder materials with excellent toughness.

▶**Anwendung** : Baustähle, Kohlenstoffstähle, legierte Stähle, vorgehärtete Stähle, Formstähle, rostfreie Stähle, gehärtete Stähle (HRc30~45), Gusseisen, Aluminiumlegierungen, Nichteisen Legierungen, Titan.

▶**Vorteile** : Maximale Selbstzentrierung durch besonderen Spitzenanschliff
Bohrergeometrie für optimale Spanabfuhr.
Premium Pulverstahl mit ausgezeichneter Zähigkeit.



HSS PM | 30° | h6 | h7 | 135° | TiAlN

p.A185

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA04020	2.0	3	24	56
CDRA04021	2.1	3	24	56
CDRA04022	2.2	3	25	56
CDRA04023	2.3	3	25	56
CDRA04024	2.4	3	30	61
CDRA04025	2.5	3	30	61
CDRA04026	2.6	3	30	61
CDRA04027	2.7	3	33	64
CDRA04028	2.8	3	33	64
CDRA04029	2.9	3	33	64
CDRA04030	3.0	3	33	64
CDRA04031	3.1	4	36	68
CDRA04032	3.2	4	36	68
CDRA04033	3.3	4	36	68
CDRA04034	3.4	4	39	71
CDRA04035	3.5	4	39	71
CDRA04036	3.6	4	39	71
CDRA04037	3.7	4	39	71
CDRA04038	3.8	4	43	75
CDRA04039	3.9	4	43	75
CDRA04040	4.0	4	43	75
CDRA04041	4.1	6	43	85
CDRA04042	4.2	6	43	85
CDRA04043	4.3	6	47	89

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D1	D2	L1	L2
CDRA04044	4.4	6	47	89
CDRA04045	4.5	6	47	89
CDRA04047	4.7	6	47	89
CDRA04048	4.8	6	52	94
CDRA04049	4.9	6	52	94
CDRA04050	5.0	6	52	94
CDRA04051	5.1	6	52	94
CDRA04052	5.2	6	52	94
CDRA04053	5.3	6	52	94
CDRA04054	5.4	6	57	99
CDRA04055	5.5	6	57	99
CDRA04056	5.6	6	57	99
CDRA04058	5.8	6	57	99
CDRA04059	5.9	6	57	99
CDRA04060	6.0	6	57	99
CDRA04061	6.1	8	63	107
CDRA04062	6.2	8	63	107
CDRA04063	6.3	8	63	107
CDRA04064	6.4	8	63	107
CDRA04065	6.5	8	63	107
CDRA04066	6.6	8	63	107
CDRA04067	6.7	8	63	107
CDRA04068	6.8	8	69	113
CDRA04069	6.9	8	69	113

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○	○	○			○		◎	○					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	○	○												○					

MULTI-1 DRILLS

CDRA04 SERIES

HSS-PM, MULTI-1 DRILLS

JOBBER

HSS-PM MULTI-1 BOHRER — ***KURZ***
Forets MULTI-1 HSS-PM Premium, série courte — ***COURTE***
PUNTA GAMBO CILINDRICO MULTI-1, HSS-PM — ***CORTA***

▶**Application** : Structural steels, Carbon steels, Alloy steels, Pre-hardened steels, Mold steels, Stainless steels, Hardened steels(HRc30~45), Cast iron, Aluminum alloys, Nonferrous alloys, Titanium.

▶**Advantage** : Point shape to maximize self-centering.
Flute design for the best chip evacuation.
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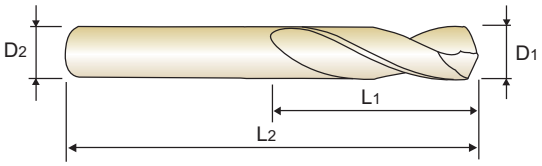
▶**Anwendung** : Baustähle, Kohlenstoffstähle, legierte Stähle, vorgehärtete Stähle, Formstähle, rostfreie Stähle, gehärtete Stähle (HRc30~45), Gusseisen, Aluminiumlegierungen, Nichteisen Legierungen, Titan.

▶**Vorteile** : Maximale Selbstzentrierung durch besonderen Spitzenanschliff
Bohrergeometrie für optimale Spanabfuhr.
Premium Pulverstahl mit ausgezeichneter Zähigkeit.



HSS PM | 30° | h6 | h7 | 135° | TiAlN

p.A185

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA04121	**12.1**	12	101	158
CDRA04122	**12.2**	12	101	158
CDRA04123	**12.3**	12	101	158
CDRA04124	**12.4**	12	101	158
CDRA04125	**12.5**	12	101	158
CDRA04126	**12.6**	12	101	158
CDRA04127	**12.7**	12	101	158

EDP No.	Drill Diameter	Shank Diameter	Flute Length	Overall Length
TiAlN	D_1	D_2	L_1	L_2
CDRA04128	**12.8**	12	101	158
CDRA04129	**12.9**	12	101	158
CDRA04130	**13.0**	12	101	158

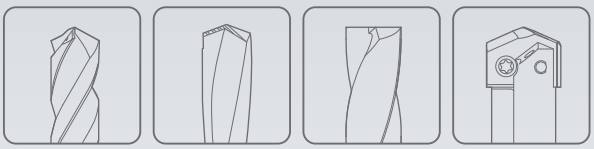
◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○	○	○			○		◎	○					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	○	○												○					

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

Global Cutting Tool Leader **YG-1**



HOLEMAKING

YG

Leading Through Innovation

HSS Co8 & HSS-E

HPD STRAIGHT SHANK DRILLS

HPD BOHRER

- **High Precision Drilling for General Steels & Stainless Steels**
- **Hochpräzises Bohren für allgemeine Stähle und rostfreie Stähle**

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	D4541	D4542	DJ543	DJ544
LENGTH	STUB	JOBBER	STUB	JOBBER
SIZE MIN	D2.0	D2.0	D2.0	D2.0
SIZE MAX	D13.0	D31.0	D13.0	D20.0
PAGE	A189	A193	A197	A200
SURFACE TREATMENT	TiN			

HSS Co8 & HSS-E
HPD STRAIGHT SHANK DRILLS

High Precision Drilling for General Steels & Stainless Steels

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A203

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	D4541	D4542	DJ543	DJ544
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	○	○
	2		About 0.45% C	Annealed	190	13	◎	◎		
	3		About 0.45% C	Quenched & Tempered	250	25	○	○		
	4		About 0.75% C	Annealed	270	28				
	5		About 0.75% C	Quenched & Tempered	300	32				
	6	Low alloy steel		Annealed	180	10	◎	◎		
	7			Quenched & Tempered	275	29	○	○		
	8			Quenched & Tempered	300	32				
	9			Quenched & Tempered	350	38				
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○		
	11			Quenched & Tempered	325	35				
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			◎	◎
	13		Martensitic	Quenched & Tempered	240	23			○	○
	14		Austenitic		180	10			◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎		
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60				◎	◎
	22		Curable	Hardened	100				◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				○	○
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

HPD DRILLS

D4541 SERIES

HSS Co8, HPD TWIST DRILLS for STEELS

STUB

PREMIUM HSS KOBALT, HPD SPIRALBOHRER für STÄHLE — EXTRA KURZ
Forets HPD HSSCo Premium pour Aciers, série extra-courte — EXTRA-COURTE
PUNTE ELICOIDALI HPD IN PREMIUM HSS Co, PER ACCIAI — EXTRA CORTA

▶**Application** : Designed for accurate drilling on NC/CNC machines. Drilling hard and tough materials, alloyed tool steels, inconel, nimonic, cast iron, aluminum die casting, etc.

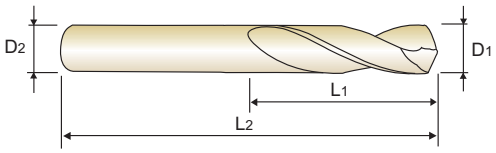
▶**Advantage** : Helical thinning - good chip removal, self-centering, reducing thrust and improving accuracy.
Reinforced web and stub length - increasing rigidity, reducing vibration and deflection.
Premium Cobalt HSS with superior TiN coating - higher speed and feed, longer tool life
High quality & good surface finish, high productivity

▶**Anwendung** : Für präzises Bohren mit NC/CNC Maschinen, geeignet zum Bearbeiten von harten und zähen Werkstücken, Legierungen, Werkzeugstahl, Nimonic, Inconel, Gusseisen, Aluminium-Guss usw.

▶**Vorteile** : Durch Kreuzanschliff gute Spanentfernung, reduzierter Druck, verbesserte Genauigkeit, selbstzentriert, extra kurze Ausführung, verbesserte Stabilität, weniger Vibrationen und Abdrängung, Premium Kobalt HSS mit hochwertiger TiN-Beschichtung, höhere Geschwindigkeit und Vorschub, längere Standzeit, verbesserte Oberflächengüte und Produktivität.

under 4mm

4mm & over



HSS Co8 | 25° | h7 | h8 | 130° | TiN

p.A188

$D_1=D_2$

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
D4541944	4.45	24	68
D4541045	4.50	24	68
D4541945	4.55	24	68
D4541046	4.60	24	68
D4541946	4.65	24	68
D4541047	4.70	24	68
D4541947	4.75	24	68
D4541048	4.80	26	70
D4541049	4.90	26	70
D4541949	4.95	26	70
D4541050	5.00	26	70
D4541950	5.05	26	70
D4541051	5.10	26	70
D4541951	5.15	26	70
D4541052	5.20	26	70
D4541952	5.25	26	70
D4541053	5.30	26	70
D4541954	5.45	28	72
D4541055	5.50	28	72
D4541955	5.55	28	72
D4541056	5.60	28	72
D4541956	5.65	28	72

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
D4541057	5.70	28	72
D4541957	5.75	28	72
D4541958	5.85	28	72
D4541059	5.90	28	72
D4541959	5.95	28	72
D4541060	6.00	28	72
D4541061	6.10	31	75
D4541062	6.20	31	75
D4541063	6.30	31	75
D4541065	6.50	31	75
D4541965	6.55	31	75
D4541066	6.60	31	75
D4541966	6.65	31	75
D4541067	6.70	31	75
D4541068	6.80	34	78
D4541069	6.90	34	78
D4541070	7.00	34	78
D4541072	7.20	34	78
D4541073	7.30	34	78
D4541973	7.35	34	78
D4541074	7.40	34	78
D4541075	7.50	34	78

▶ TiCN(D7541), TiAlN(DQ541) are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○			○					◎					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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HPD DRILLS

D4541 SERIES

HSS Co8, HPD TWIST DRILLS for STEELS

STUB

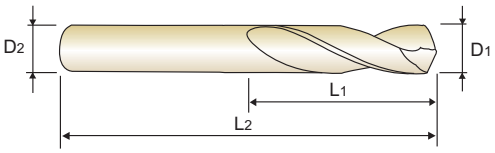
PREMIUM HSS KOBALT, HPD SPIRALBOHRER für STÄHLE — EXTRA KURZ
Forets HPD HSSCo Premium pour Aciers, série extra-courte — EXTRA-COURTE
PUNTE ELICOIDALI HPD IN PREMIUM HSS Co, PER ACCIAI — EXTRA CORTA

▶**Application** : Designed for accurate drilling on NC/CNC machines. Drilling hard and tough materials, alloyed tool steels, inconel, nimonic, cast iron, aluminum die casting, etc.

▶**Advantage** : Helical thinning - good chip removal, self-centering, reducing thrust and improving accuracy.
Reinforced web and stub length - increasing rigidity, reducing vibration and deflection.
Premium Cobalt HSS with superior TiN coating - higher speed and feed, longer tool life
High quality & good surface finish, high productivity

▶**Anwendung** : Für präzises Bohren mit NC/CNC Maschinen, geeignet zum Bearbeiten von harten und zähen Werkstücken, Legierungen, Werkzeugstahl, Nimonic, Inconel, Gusseisen, Aluminium-Guss usw.

▶**Vorteile** : Durch Kreuzanschliff gute Spanentfernung, reduzierter Druck, verbesserte Genauigkeit, selbstzentriert, extra kurze Ausführung, verbesserte Stabilität, weniger Vibrationen und Abdrängung, Premium Kobalt HSS mit hochwertiger TiN-Beschichtung, höhere Geschwindigkeit und Vorschub, längere Standzeit, verbesserte Oberflächengüte und Produktivität.



HSS Co8 | 25° | h7 | h8 | 130° | TiN

p.A203

$D_1=D_2$

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
D4541122	12.20	51	108
D4541124	12.40	51	108
D4541125	12.50	51	108
D4541126	12.60	51	108
D4541127	12.70	51	108
D4541128	12.80	51	108
D4541129	12.90	51	108
D4541130	13.00	51	108

▶ TiCN(D7541), TiAlN(DQ541) are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○			○					◎					

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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HPD DRILLS

D4542 SERIES

HSS Co8, HPD TWIST DRILLS for STEELS

JOBBER

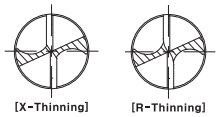
PREMIUM HSS KOBALT, HPD SPIRALBOHRER für STÄHLE — KURZ
Forets HPD HSSCo Premium pour Aciers, série courte — COURTE
PUNTE ELICOIDALI HPD IN PREMIUM HSS Co, PER ACCIAI — CORTA

▶**Application** : Designed for high speed non-step 4D~5D drilling.
Drilling mild steels, cast iron, aluminum, alloyed tool steels, etc.

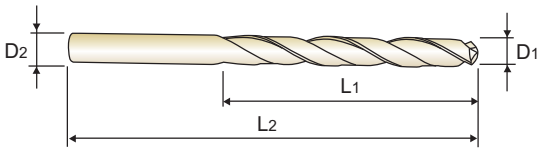
▶**Advantage** : Helical thinning - good chip removal, self-centering, reducing thrust and improving accuracy.
Reinforced web and jobbers length - increasing rigidity and suitable for 4D~5D drilling
Premium Cobalt HSS with superior TiN coating - higher speed and feed, longer tool life
High quality & good surface finish, high productivity.

▶**Anwendung** : Zum Hochgeschwindigkeitsbohren 4D~5D Bohrtiefe geeignet zum Bearbeiten von Stahl, Gusseisen, Aluminium, Legierungen, Werkzeugstahl, usw.

▶**Vorteile** : Gute Spanabfuhr, selbstzentriert, geringere Abdrängung und verbesserte Genauigkeit, kurze Ausführung, verbesserte Stabilität, zum Bearbeiten von Premium kobalt HSS mit hochwertiger TiN-Beschichtung, höhere Geschwindigkeit und Vorschub, längere Standzeit, verbesserte Oberflächengüte und Produktivität.



under 4mm　4mm & over



HSS Co8 | 30° | h7 | h6 | h8 | 130° | TiN

up to 13mm　over 13mm

p.A203

$D_1=D_2$

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
D4542047	4.70	47	91
D4542947	4.75	47	91
D4542048	4.80	52	96
D4542049	4.90	52	96
D4542949	4.95	52	96
D4542950	5.05	52	96
D4542051	5.10	52	96
D4542951	5.15	52	96
D4542052	5.20	52	96
D4542952	5.25	52	96
D4542053	5.30	52	96
D4542054	5.40	57	101
D4542055	5.50	57	101
D4542955	5.55	57	101
D4542056	5.60	57	101
D4542956	5.65	57	101
D4542057	5.70	57	101
D4542957	5.75	57	101
D4542058	5.80	57	101
D4542958	5.85	57	101
D4542059	5.90	57	101
D4542959	5.95	57	101
D4542060	6.00	57	101

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
D4542960	6.05	63	107
D4542061	6.10	63	107
D4542961	6.15	63	107
D4542062	6.20	63	107
D4542962	6.25	63	107
D4542064	6.40	63	107
D4542964	6.45	63	107
D4542065	6.50	63	107
D4542067	6.70	63	107
D4542967	6.75	69	113
D4542068	6.80	69	113
D4542968	6.85	69	113
D4542069	6.90	69	113
D4542969	6.95	69	113
D4542070	7.00	69	113
D4542970	7.05	69	113
D4542072	7.20	69	113
D4542972	7.25	69	113
D4542973	7.35	69	113
D4542074	7.40	69	113
D4542974	7.45	69	113
D4542075	7.50	69	113
D4542975	7.55	75	119

▶ TiCN(D7542), TiAlN(DQ542) are available on your request.

▶ NEXT PAGE

◎ : Excellent　○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○			○					◎					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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HPD DRILLS

D4542 SERIES

HSS Co8, HPD TWIST DRILLS for STEELS

JOBBER

PREMIUM HSS KOBALT, HPD SPIRALBOHRER für STÄHLE — **KURZ**

Forets HPD HSSCo Premium pour Aciers, série courte — **COURTE**

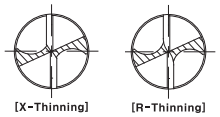
PUNTE ELICOIDALI HPD IN PREMIUM HSS Co, PER ACCIAI — **CORTA**

▶**Application** : Designed for high speed non-step 4D~5D drilling. Drilling mild steels, cast iron, aluminum, alloyed tool steels, etc.

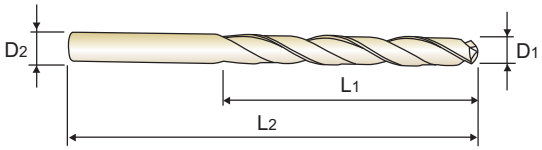
▶**Advantage** : Helical thinning - good chip removal, self-centering, reducing thrust and improving accuracy.
Reinforced web and jobbers length - increasing rigidity and suitable for 4D~5D drilling
Premium Cobalt HSS with superior TiN coating - higher speed and feed, longer tool life
High quality & good surface finish, high productivity.

▶**Anwendung** : Zum Hochgeschwindigkeitsbohren 4D~5D Bohrtiefe geeignet zum Bearbeiten von Stahl, Gusseisen, Aluminium, Legierungen, Werkzeugstahl, usw.

▶**Vorteile** : Gute Spanabfuhr, selbstzentriert, geringere Abdrängung und verbesserte Genauigkeit, kurze Ausführung, verbesserte Stabilität, zum Bearbeiten von Premium kobalt HSS mit hochwertiger TiN-Beschichtung, höhere Geschwindigkeit und Vorschub, längere Standzeit, verbesserte Oberflächengüte und Produktivität.



under 4mm　4mm & over



HSS Co8 | 30° | h7 | h6 | h8 | 130° | TiN

up to 13mm　over 13mm

p.A203

$D_1 = D_2$

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
D4542111	11.10	94	151
D4542112	11.20	94	151
D4542812	11.25	94	151
D4542113	11.30	94	151
D4542115	11.50	94	151
D4542815	11.55	94	151
D4542117	11.70	94	151
D4542817	11.75	94	151
D4542118	11.80	94	151
D4542819	11.95	101	158
D4542120	12.00	101	158
D4542121	12.10	101	158
D4542122	12.20	101	158
D4542123	12.30	101	158
D4542124	12.40	101	158
D4542125	12.50	101	158
D4542126	12.60	101	158
D4542127	12.70	101	158
D4542129	12.90	101	158
D4542130	13.00	101	158
D4542135	13.50	90	150
D4542140	14.00	90	150
D4542141	14.10	95	155

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
D4542145	14.50	95	155
D4542150	15.00	95	161
D4542155	15.50	100	166
D4542160	16.00	100	166
D4542165	16.50	106	172
D4542170	17.00	106	172
D4542175	17.50	112	178
D4542176	17.60	112	178
D4542180	18.00	112	178
D4542190	19.00	118	194
D4542195	19.50	125	201
D4542200	20.00	125	201
D4542205	20.50	128	204
D4542210	21.00	128	204
D4542220	22.00	132	208
D4542235	23.50	136	212
D4542250	25.00	140	220
D4542255	25.50	145	225
D4542265	26.50	145	225
D4542280	28.00	150	230
D4542290	29.00	155	235
D4542310	31.00	160	240

▶ TiCN(D7542), TiAlN(DQ542) are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○			○					◎					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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HPD DRILLS

DJ543 SERIES

HSS-E, HPD-SUS TWIST DRILLS for STAINLESS STEELS

STUB

HSS-E, HPD-SUS SPIRALBOHRER für ROSTFREIER STÄHLE — EXTRA KURZ
Forets HPD-SUS HSS-E pour INOX, série extra-courte — EXTRA-COURTE
PUNTE ELICOIDALI HPD-SUS IN HSS-E, PER ACCIAI INOX — EXTRA CORTA

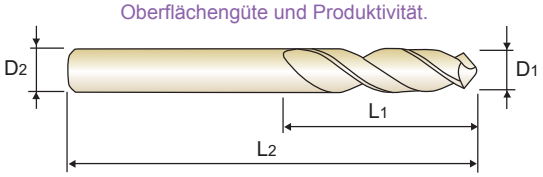
▶**Application** : Designed for drilling stainless steels, mild steels, aluminum, aluminum alloys, aluminum die casting, copper, copper alloys, etc.

▶**Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Wide flute and stub length-increasing chip removal and reducing vibration and deflecton.
High vanadium HSS-E material with superior TiN coating - higher speed and feed, longer tool life
High quality & good surface finish, high productivity.

▶**Anwendung** : Geeignet zum Bearbeiten von rostfreier stähle, Aluminium, Aluminium-Legierungen, Aluminium-Guss, Kupfer, Kupfer-Legierungen usw.

▶**Vorteile** : Durch hohen Helix wird Spanstau vermieden, geeignet zum Hochleistungsbohren, durch die breiten Schneiden und die kurze Ausführung wird die Spanabfuhr erhöht und Vibrationen und Stoß reduziert. Hoch Vanadium HSS-E-Material mit TiN-Beschichtung, höhere Geschwindigkeit und Vorschub, längere Standzeit, verbesserte Oberflächengüte und Produktivität.

four facet



for STAINLESS STEELS
für rostfreier Stäle

HSS-E | 38° | h7 | h8 | 130° | 120° | TiN

up to 4mm | over 4mm

p.A203

$D_1=D_2$

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
DJ543066	6.60	31	75
DJ543067	6.70	31	75
DJ543068	6.80	34	78
DJ543069	6.90	34	78
DJ543070	7.00	34	78
DJ543071	7.10	34	78
DJ543072	7.20	34	78
DJ543073	7.30	34	78
DJ543074	7.40	34	78
DJ543075	7.50	34	78
DJ543076	7.60	37	81
DJ543077	7.70	37	81
DJ543078	7.80	37	81
DJ543079	7.90	37	81
DJ543080	8.00	37	81
DJ543081	8.10	37	87
DJ543082	8.20	37	87
DJ543083	8.30	37	87
DJ543084	8.40	37	87
DJ543085	8.50	37	87
DJ543086	8.60	40	90
DJ543087	8.70	40	90

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
DJ543088	8.80	40	90
DJ543089	8.90	40	90
DJ543090	9.00	40	90
DJ543091	9.10	40	90
DJ543092	9.20	40	90
DJ543093	9.30	40	90
DJ543094	9.40	40	90
DJ543095	9.50	40	90
DJ543096	9.60	43	93
DJ543098	9.80	43	93
DJ543099	9.90	43	93
DJ543100	10.00	43	93
DJ543101	10.10	43	100
DJ543102	10.20	43	100
DJ543103	10.30	43	100
DJ543104	10.40	43	100
DJ543105	10.50	43	100
DJ543106	10.60	43	100
DJ543107	10.70	47	104
DJ543108	10.80	47	104
DJ543109	10.90	47	104
DJ543110	11.00	47	104

▶ TiCN(DW543), TiAlN(DY543) are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○											◎	○	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎				○															

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YG-1 CO., LTD.

HPD DRILLS

DJ544 SERIES

HSS-E, HPD-SUS TWIST DRILLS for STAINLESS STEELS

JOBBER

HSS-E, HPD-SUS SPIRALBOHRER für ROSTFREIER STÄHLE — **KURZ**
Forets HPD-SUS HSS-E pour INOX, série courte — **COURTE**
PUNTE ELICOIDALI HPD-SUS IN HSS-E, PER ACCIAI INOX — **CORTA**

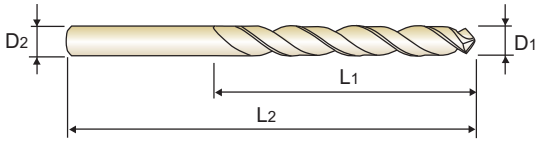
▶**Application** : Designed for 4D~5D drilling stainless steels, mild steels, aluminum, aluminum alloys, aluminum die casting, copper, copper alloys, etc.

▶**Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Reinforced web and jobbers length-increasing rigidity and suitable for 4D~5D drilling.
High vanadium HSS-E material with superior TiN coating - higher speed and feed, longer tool life
High quality & good surface finish, high productivity.

▶**Anwendung** : Für 4D~5D Bohrtiefe, geeignet für rostfreier stähle, Stahl, Aluminium, Aluminium-Legierungen, Aluminium-Guss, Kupfer, Kupfer-Legierung usw.

▶**Vorteile** : Helixwinkel, durch scharfe Hauptschneide wird Spanstau vermieden, geeignet zum Hochleistungsbohren, verstärkte Kerndicke, kurze Ausführung, Hoch Vanadium HSS-E-Material mit TiN-Beschichtung, höhere Geschwindigkeit und Vorschub, längere Standzeit, verbesserte Stabilität, Oberflächengüte und Produktivität.

up to 13mm over 13mm



for STAINLESS STEELS
für rostfreier Stäle

HSS-E | 38° | h7 | h8 | 130° | 120° | TiN | p.A203

up to 4mm over 4mm

D1=D2

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D1	L1	L2
DJ544020	2.00	24	56
DJ544021	2.10	24	56
DJ544022	2.20	27	59
DJ544023	2.30	27	59
DJ544024	2.40	30	62
DJ544025	2.50	30	62
DJ544026	2.60	30	62
DJ544027	2.70	33	65
DJ544028	2.80	33	65
DJ544029	2.90	33	65
DJ544030	3.00	33	65
DJ544031	3.10	36	68
DJ544032	3.20	36	68
DJ544033	3.30	36	68
DJ544034	3.40	39	71
DJ544035	3.50	39	71
DJ544036	3.60	39	71
DJ544037	3.70	39	71
DJ544038	3.80	43	75
DJ544039	3.90	43	75
DJ544040	4.00	43	75
DJ544041	4.10	43	87

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D1	L1	L2
DJ544042	4.20	43	87
DJ544043	4.30	47	91
DJ544044	4.40	47	91
DJ544045	4.50	47	91
DJ544046	4.60	47	91
DJ544047	4.70	47	91
DJ544048	4.80	52	96
DJ544049	4.90	52	96
DJ544050	5.00	52	96
DJ544051	5.10	52	96
DJ544052	5.20	52	96
DJ544053	5.30	52	96
DJ544055	5.50	57	101
DJ544056	5.60	57	101
DJ544057	5.70	57	101
DJ544058	5.80	57	101
DJ544059	5.90	57	101
DJ544060	6.00	57	101
DJ544061	6.10	63	107
DJ544062	6.20	63	107
DJ544063	6.30	63	107
DJ544064	6.40	63	107

▶ TiCN(DW544), TiAlN(DY544) are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○											◎	○	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎				○															

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HPD DRILLS

DJ544 SERIES

HSS-E, HPD-SUS TWIST DRILLS for STAINLESS STEELS

JOBBER

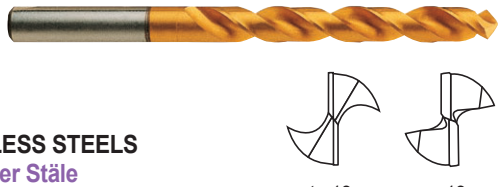
HSS-E, HPD-SUS SPIRALBOHRER für ROSTFREIER STÄHLE — **KURZ**
Forets HPD-SUS HSS-E pour INOX, série courte — **COURTE**
PUNTE ELICOIDALI HPD-SUS IN HSS-E, PER ACCIAI INOX — **CORTA**

▶**Application** : Designed for 4D~5D drilling stainless steels, mild steels, aluminum, aluminum alloys, aluminum die casting, copper, copper alloys, etc.

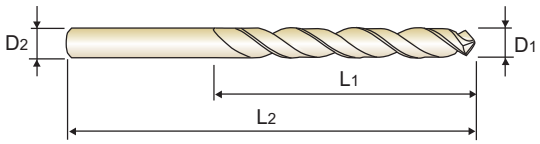
▶**Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Reinforced web and jobbers length-increasing rigidity and suitable for 4D~5D drilling.
High vanadium HSS-E material with superior TiN coating - higher speed and feed, longer tool life
High quality & good surface finish, high productivity.

▶**Anwendung** : Für 4D~5D Bohrtiefe, geeignet für rostfreier stähle, Stahl, Aluminium, Aluminium-Legierungen, Aluminium-Guss, Kupfer, Kupfer-Legierung usw.

▶**Vorteile** : Helixwinkel, durch scharfe Hauptschneide wird Spanstau vermieden, geeignet zum Hochleistungsbohren, verstärkte Kerndicke, kurze Ausführung, Hoch Vanadium HSS-E-Material mit TiN-Beschichtung, höhere Geschwindigkeit und Vorschub, längere Standzeit, verbesserte Stabilität, Oberflächengüte und Produktivität.



up to 13mm over 13mm



for STAINLESS STEELS
für rostfreier Stäle

HSS-E | 38° | h7 | h8 | 130° | 120° | TiN

up to 4mm over 4mm

p.A203

$D_1=D_2$

Unit : mm

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
DJ544109	10.90	94	151
DJ544110	11.00	94	151
DJ544111	11.10	94	151
DJ544112	11.20	94	151
DJ544113	11.30	94	151
DJ544114	11.40	94	151
DJ544115	11.50	94	151
DJ544116	11.60	94	151
DJ544117	11.70	94	151
DJ544118	11.80	94	151
DJ544119	11.90	101	158
DJ544120	12.00	101	158
DJ544121	12.10	101	158
DJ544122	12.20	101	158
DJ544123	12.30	101	158
DJ544124	12.40	101	158
DJ544125	12.50	101	158
DJ544126	12.60	101	158
DJ544127	12.70	101	158
DJ544128	12.80	101	158
DJ544129	12.90	101	158
DJ544130	13.00	101	158

EDP No.	Drill Diameter	Flute Length	Overall Length
TiN	D_1	L_1	L_2
DJ544135	13.50	106	166
DJ544141	14.10	109	169
DJ544145	14.50	109	169
DJ544150	15.00	109	169
DJ544155	15.50	112	172
DJ544156	15.60	112	172
DJ544160	16.00	112	172
DJ544165	16.50	115	181
DJ544170	17.00	115	181
DJ544180	18.00	118	184
DJ544185	18.50	122	188
DJ544190	19.00	122	188
DJ544195	19.50	125	191
DJ544196	19.60	125	191
DJ544200	20.00	125	191

▶ TiCN(DW544), TiAlN(DY544) are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○											◎	○	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎				○															

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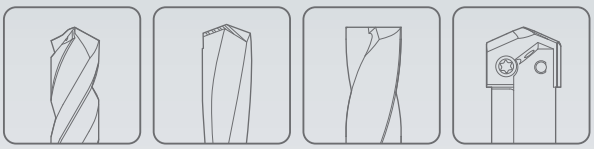


HOLEMAKING

Leading Through Innovation

HSS & HSS-E

GOLD-P DRILLS

GOLD-P BOHRER

- Same Performance as Full TiN-coated Drills
- Gleiche Leistung, wie bei voll TiN-beschichteten Bohrern

SELECTION GUIDE

YG HOLEMAKING TOOLS

HSS & HSS-E
GOLD-P DRILLS

Same Performance as Full TiN-coated Drills

SERIES	D1GP125	D1GP165
STANDARD	DIN 338	DIN 338
LENGTH	JOBBER	JOBBER
SIZE MIN	D1.0	D1.6
SIZE MAX	D13.0	D13.0
PAGE	A208	A212
SURFACE TREATMENT	TiN	

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A219

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	D1GP125	D1GP165
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	○	○
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29	○	○
	8			Quenched & Tempered	300	32	○	○
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	○	○
	14		Austenitic		180	10	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○
	16		Pearlitic (Martensitic)		260	26	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130		○	○
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60		○	○
	22		Curable	Hardened	100		○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○	○
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

GOLD-P DRILLS

D1GP125 SERIES

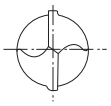
HSS, STRAIGHT SHANK DRILLS, GOLD-P COATED

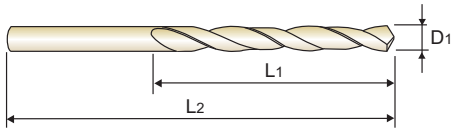
JOBBER
KURZ
COURTE
CORTA

HSS SPIRALBOHRER, GOLD-P BESCHICHTET
Forets GOLD-P HSS queue cylindrique revêtus, série courte
PUNTE IN HSS, GAMBO CILINDRICO, GOLD-P

▶**Flute Geometry** : Right hand helix
▶**Point Angle** : 118˚, Normal point
▶**Surface treatment** : Bright body, TiN coating on working area
▶**Application** : Drilling unalloyed and alloyed steels, stainless steels as well as certain cast irons, non-ferrous and heat resistant materials

▶**Nutenform** : Rechtsspirale
▶**Spitzenwinkel** : 118° Normalanschliff
▶**Oberfläche** : Blank mit TiN-Beschichtung im Arbeitsbereich
▶**Anwendung** : Bohren von unlegierten und legierten Stählen, nichtrostenden Stählen sowie bestimmten Gusseisen, Nichteisenmetallen und hitzebeständigen Werkstoffen





DIN 338 | HSS | N ≈ 30° | h8 | 118° | TiN

p.A219

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP125010	1.0	12	34
D1GP125011	1.1	14	36
D1GP125012	1.2	16	38
D1GP125013	1.3	16	38
D1GP125014	1.4	18	40
D1GP125015	1.5	18	40
D1GP125016	1.6	20	43
D1GP125017	1.7	20	43
D1GP125018	1.8	22	46
D1GP125019	1.9	22	46
D1GP125020	2.0	24	49
D1GP125021	2.1	24	49
D1GP125022	2.2	27	53
D1GP125023	2.3	27	53
D1GP125024	2.4	30	57
D1GP125025	2.5	30	57
D1GP125026	2.6	30	57
D1GP125027	2.7	33	61
D1GP125028	2.8	33	61
D1GP125029	2.9	33	61
D1GP125030	3.0	33	61
D1GP125031	3.1	36	65
D1GP125032	3.2	36	65
D1GP125033	3.3	36	65
D1GP125034	3.4	39	70
D1GP125035	3.5	39	70
D1GP125036	3.6	39	70
D1GP125037	3.7	39	70
D1GP125038	3.8	43	75
D1GP125039	3.9	43	75

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP125040	4.0	43	75
D1GP125041	4.1	43	75
D1GP125042	4.2	43	75
D1GP125043	4.3	47	80
D1GP125044	4.4	47	80
D1GP125045	4.5	47	80
D1GP125046	4.6	47	80
D1GP125047	4.7	47	80
D1GP125048	4.8	52	86
D1GP125049	4.9	52	86
D1GP125050	5.0	52	86
D1GP125051	5.1	52	86
D1GP125052	5.2	52	86
D1GP125053	5.3	52	86
D1GP125054	5.4	57	93
D1GP125055	5.5	57	93
D1GP125056	5.6	57	93
D1GP125057	5.7	57	93
D1GP125058	5.8	57	93
D1GP125059	5.9	57	93
D1GP125060	6.0	57	93
D1GP125061	6.1	63	101
D1GP125062	6.2	63	101
D1GP125063	6.3	63	101
D1GP125064	6.4	63	101
D1GP125065	6.5	63	101
D1GP125066	6.6	63	101
D1GP125067	6.7	63	101
D1GP125068	6.8	69	109
D1GP125071	7.1	69	109

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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YG-1 CO., LTD.

GOLD-P DRILLS

D1GP165 SERIES

HSS, STRAIGHT SHANK DRILLS, GOLD-P COATED

JOBBER

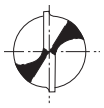
HSS SPIRALBOHRER, GOLD-P BESCHICHTET — *KURZ*

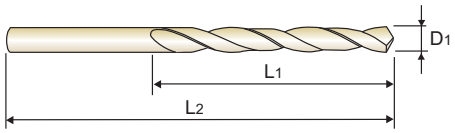
Forets GOLD-P HSS queue cylindrique revêtus, série courte — *COURTE*

PUNTE IN HSS, GAMBO CILINDRICO, GOLD-P — *CORTA*

- ▶**Flute Geometry** : Right hand helix
- ▶**Point Angle** : 118˚, Normal point
- ▶**Surface treatment** : Bright body, TiN coating on working area
- ▶**Application** : Drilling unalloyed and alloyed steels, stainless steels as well as certain cast irons, non-ferrous and heat resistant materials

- ▶**Nutenform** : Rechtsspirale
- ▶**Spitzenwinkel** : 118° Normalanschliff
- ▶**Oberfläche** : Blank mit TiN-Beschichtung im Arbeitsbereich
- ▶**Anwendung** : Bohren von unlegierten und legierten Stählen, nichtrostenden Stählen sowie bestimmten Gusseisen, Nichteisenmetallen und hitzebeständigen Werkstoffen





DIN 338 | HSS | N ≈ 30° | h8 | 118° | TiN

p.A219

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP165016	1.6	20	43
D1GP165017	1.7	20	43
D1GP165018	1.8	22	46
D1GP165019	1.9	22	46
D1GP165020	2.0	24	49
D1GP165021	2.1	24	49
D1GP165022	2.2	27	53
D1GP165023	2.3	27	53
D1GP165024	2.4	30	57
D1GP165025	2.5	30	57
D1GP165026	2.6	30	57
D1GP165027	2.7	33	61
D1GP165028	2.8	33	61
D1GP165029	2.9	33	61
D1GP165030	3.0	33	61
D1GP165031	3.1	36	65
D1GP165032	3.2	36	65
D1GP165033	3.3	36	65
D1GP165034	3.4	39	70
D1GP165035	3.5	39	70
D1GP165036	3.6	39	70
D1GP165037	3.7	39	70
D1GP165038	3.8	43	75
D1GP165039	3.9	43	75
D1GP165040	4.0	43	75
D1GP165041	4.1	43	75

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP165042	4.2	43	75
D1GP165043	4.3	47	80
D1GP165044	4.4	47	80
D1GP165045	4.5	47	80
D1GP165046	4.6	47	80
D1GP165047	4.7	47	80
D1GP165048	4.8	52	86
D1GP165049	4.9	52	86
D1GP165050	5.0	52	86
D1GP165051	5.1	52	86
D1GP165052	5.2	52	86
D1GP165053	5.3	52	86
D1GP165054	5.4	57	93
D1GP165055	5.5	57	93
D1GP165056	5.6	57	93
D1GP165057	5.7	57	93
D1GP165058	5.8	57	93
D1GP165059	5.9	57	93
D1GP165060	6.0	57	93
D1GP165061	6.1	63	101
D1GP165062	6.2	63	101
D1GP165063	6.3	63	101
D1GP165064	6.4	63	101
D1GP165065	6.5	63	101
D1GP165066	6.6	63	101
D1GP165067	6.7	63	101

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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GOLD-P DRILLS

D1GP165 SERIES

HSS, STRAIGHT SHANK DRILLS, GOLD-P COATED

JOBBER

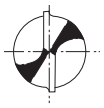
HSS SPIRALBOHRER, GOLD-P BESCHICHTET — *KURZ*

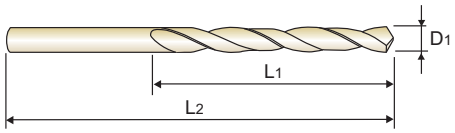
Forets GOLD-P HSS queue cylindrique revêtus, série courte — *COURTE*

PUNTE IN HSS, GAMBO CILINDRICO, GOLD-P — *CORTA*

▶**Flute Geometry** : Right hand helix
▶**Point Angle** : 118˚, Normal point
▶**Surface treatment** : Bright body, TiN coating on working area
▶**Application** : Drilling unalloyed and alloyed steels, stainless steels as well as certain cast irons, non-ferrous and heat resistant materials

▶**Nutenform** : Rechtsspirale
▶**Spitzenwinkel** : 118° Normalanschliff
▶**Oberfläche** : Blank mit TiN-Beschichtung im Arbeitsbereich
▶**Anwendung** : Bohren von unlegierten und legierten Stählen, nichtrostenden Stählen sowie bestimmten Gusseisen, Nichteisenmetallen und hitzebeständigen Werkstoffen





DIN 338 | HSS | N ≈ 30° | h8 | 118° | TiN

p.A219

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP165120	12.0	101	151
D1GP165121	12.1	101	151
D1GP165122	12.2	101	151
D1GP165123	12.3	101	151
D1GP165124	12.4	101	151
D1GP165125	12.5	101	151

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1GP165126	12.6	101	151
D1GP165127	12.7	101	151
D1GP165128	12.8	101	151
D1GP165129	12.9	101	151
D1GP165130	13.0	101	151

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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GOLD-P DRILLS

DLGP195 SERIES

HSS-E, STRAIGHT SHANK DRILLS, GOLD-P COATED

JOBBER

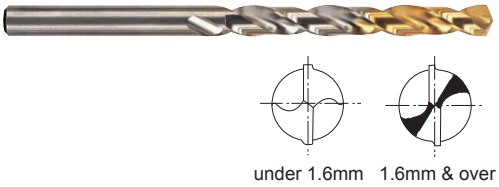
HSS-E SPIRALBOHRER, GOLD-P BESCHICHTET — *KURZ*

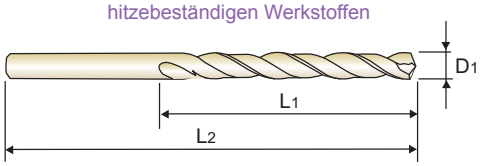
Forets GOLD-P HSS-E queue cylindrique revêtus, série courte — *COURTE*

PUNTE IN HSS-E, GAMBO CILINDRICO, GOLD-P — *CORTA*

▶**Flute Geometry** : Right hand helix
▶**Point Angle** : 135˚, under 1.6mm : Normal point
1.6mm & over : Split point
▶**Surface treatment** : Bright body, TiN coating on working area
▶**Application** : Deep hole drilling in unalloyed and alloyed steels, stainless steels as well as certain cast irons, non-ferrous and heat resistant materials

▶**Nutenform** : Rechtsspirale
▶**Spitzenwinkel** : 135°, unter 1.6mm : Normalanschliff
1.6mm & über : Kreuzanschliff
▶**Oberfläche** : Blank mit TiN-Beschichtung im Arbeitsbereich
▶**Anwendung** : Bohren tiefer Bohrungen in unlegierten und legierten Stählen, nichtrostenden Stählen sowie bestimmten Gusseisen, Nichteisenmetallen und hitzebeständigen Werkstoffen





DIN 338 | HSS-E | 33° | h8 | 135° | TiN

p.A219

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DLGP195062	6.2	63	101
DLGP195063	6.3	63	101
DLGP195064	6.4	63	101
DLGP195065	6.5	63	101
DLGP195066	6.6	63	101
DLGP195067	6.7	63	101
DLGP195068	6.8	69	109
DLGP195069	6.9	69	109
DLGP195070	7.0	69	109
DLGP195071	7.1	69	109
DLGP195072	7.2	69	109
DLGP195073	7.3	69	109
DLGP195074	7.4	69	109
DLGP195075	7.5	69	109
DLGP195076	7.6	75	117
DLGP195077	7.7	75	117
DLGP195078	7.8	75	117
DLGP195079	7.9	75	117
DLGP195080	8.0	75	117
DLGP195081	8.1	75	117
DLGP195082	8.2	75	117
DLGP195083	8.3	75	117
DLGP195084	8.4	75	117
DLGP195085	8.5	75	117
DLGP195086	8.6	81	125
DLGP195087	8.7	81	125

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DLGP195088	8.8	81	125
DLGP195089	8.9	81	125
DLGP195090	9.0	81	125
DLGP195091	9.1	81	125
DLGP195092	9.2	81	125
DLGP195093	9.3	81	125
DLGP195094	9.4	81	125
DLGP195095	9.5	81	125
DLGP195096	9.6	87	133
DLGP195097	9.7	87	133
DLGP195098	9.8	87	133
DLGP195099	9.9	87	133
DLGP195100	10.0	87	133
DLGP195101	10.1	87	133
DLGP195102	10.2	87	133
DLGP195103	10.3	87	133
DLGP195104	10.4	87	133
DLGP195105	10.5	87	133
DLGP195106	10.6	87	133
DLGP195107	10.7	94	142
DLGP195108	10.8	94	142
DLGP195109	10.9	94	142
DLGP195110	11.0	94	142
DLGP195111	11.1	94	142
DLGP195112	11.2	94	142
DLGP195113	11.3	94	142

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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GOLD-P DRILLS

DLGP506 SERIES

HSS-E, DH100 STRAIGHT SHANK DRILLS for DEEP HOLES, GOLD-P COATED

JOBBER

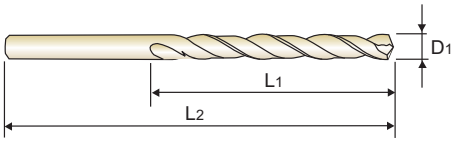
HSS-E DH100 SPIRALBOHRER, für TIEFLOCH mit ZYLINDERSCHAFT, GOLD-P BESCHICHTET — *KURZ*

Forets GOLD-P HSS-E queue cylindrique revêtus, DH100 pour perçage profond, série courte — *COURTE*

PUNTE GAMBO CILINDRICO DH100 IN HSS-E, PER FORI PROFONDI, GOLD-P — *CORTA*

▶**Flute Geometry** : Right hand, 38° helix, DH100 worm pattern type.
▶**Point Angle** : 130°, Split point giving higher chip removal.
▶**Surface treatment** : Bright body, TiN coating on working area.
▶**Application** : Deep hole drilling in unalloyed and alloyed steels as well as cast irons that require support during chip removal

▶**Nutenform** : 38° Rechtsspirale, DH 100 Flachnut
▶**Spitzenwinkel** : Durch 130° Kreuzanschliff Gute Spanabfuhr
▶**Oberfläche** : Blank mit TiN-Beschichtung im Arbeitsbereich
▶**Anwendung** : Tieflochbohren in unlegierten und legierten Stählen sowie Gusseisen mit aktiver Unterstützung bei der Spanabfuhr



▶ DH100 worm pattern drills

DIN 338 | HSS-E | 38° | h8 | 130° | TiN

p.A219

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DLGP506020	2.0	24	49
DLGP506021	2.1	24	49
DLGP506022	2.2	27	53
DLGP506023	2.3	27	53
DLGP506025	2.5	30	57
DLGP506026	2.6	30	57
DLGP506028	2.8	33	61
DLGP506030	3.0	33	61
DLGP506033	3.3	36	65
DLGP506034	3.4	39	70
DLGP506035	3.5	39	70
DLGP506036	3.6	39	70
DLGP506038	3.8	43	75
DLGP506039	3.9	43	75
DLGP506040	4.0	43	75
DLGP506041	4.1	43	75
DLGP506042	4.2	43	75
DLGP506044	4.4	47	80
DLGP506046	4.6	47	80
DLGP506048	4.8	52	86
DLGP506050	5.0	52	86
DLGP506051	5.1	52	86
DLGP506052	5.2	52	86
DLGP506053	5.3	52	86
DLGP506054	5.4	57	93
DLGP506055	5.5	57	93

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DLGP506056	5.6	57	93
DLGP506058	5.8	57	93
DLGP506059	5.9	57	93
DLGP506060	6.0	57	93
DLGP506062	6.2	63	101
DLGP506063	6.3	63	101
DLGP506064	6.4	63	101
DLGP506066	6.6	63	101
DLGP506067	6.7	63	101
DLGP506068	6.8	69	109
DLGP506069	6.9	69	109
DLGP506070	7.0	69	109
DLGP506075	7.5	69	109
DLGP506076	7.6	75	117
DLGP506077	7.7	75	117
DLGP506078	7.8	75	117
DLGP506080	8.0	75	117
DLGP506082	8.2	75	117
DLGP506083	8.3	75	117
DLGP506084	8.4	75	117
DLGP506085	8.5	75	117
DLGP506086	8.6	81	125
DLGP506087	8.7	81	125
DLGP506089	8.9	81	125
DLGP506090	9.0	81	125
DLGP506091	9.1	81	125

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○					○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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GOLD-P DRILLS

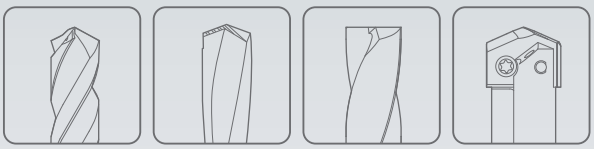
GOLD-P COATED DRILL SETS

GOLD-P BESCHICHTET BOHRER SATS
Coffrets de Forets GOLD-P revêtus
SET DI PUNTE GOLD-P

DIN 338 DRILL SETS JOBBER LENGTH Gold-P coated Drills

EDP No.	DESCRIPTON	SIZE	Q'TY
D1GP165SET1	HSS Straight Shank, Split Point (Ø1.0 & Ø1.5 : NORMAL point)	1.0-10.0x0.5mm step	19 pcs
D1GP165SET2	HSS Straight Shank, Split Point (Ø1.0 & Ø1.5 : NORMAL point)	1.0-13.0x0.5mm step	25 pcs
D1GP165SET3	HSS Straight Shank, Split Point (Ø1.0 & Ø1.5 : NORMAL point)	1.0-10.5x0.5mm step +3.3 +4.2 +6.8 +10.2	24 pcs
DLGP195SET1	HSS-E Straight Shank, Split Point (Ø1.0 & Ø1.5 : NORMAL point)	1.0-10.0x0.5mm step	19 pcs
DLGP195SET2	HSS-E Straight Shank, Split Point (Ø1.0 & Ø1.5 : NORMAL point)	1.0-13.0x0.5mm step	25 pcs
DLGP195SET3	HSS-E Straight Shank, Split Point (Ø1.0 & Ø1.5 : NORMAL point)	1.0-10.5x0.5mm step +3.3 +4.2 +6.8 +10.2	24 pcs
DLGPSET982	HSS-E Straight Shank, Split Point (Ø1.0 & Ø1.5 : NORMAL point)	1.0-10.0x0.1mm step	91 pcs

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

SUPER HSS

SUPER-GP DRILLS

SUPER-GP DRILLS

- All Applications Regardless of Machining Conditions; Good or Poor
- Für alle Anwendungen unabhängig von den Bearbeitungsbedingungen; gut oder schlecht

SERIES	DSH105
STANDARD	DIN 338
LENGTH	JOBBER
SIZE MIN	D2.0
SIZE MAX	D13.0
PAGE	A223
SURFACE TREATMENT	Vap

SUPER HSS
SUPER-GP DRILLS

All Applications Regardless of Machining Conditions; Good or Poor

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A225

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎
	2		About 0.45% C	Annealed	190	13	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎
	4		About 0.75% C	Annealed	270	28	○
	5		About 0.75% C	Quenched & Tempered	300	32	
	6	Low alloy steel		Annealed	180	10	◎
	7			Quenched & Tempered	275	29	○
	8			Quenched & Tempered	300	32	○
	9			Quenched & Tempered	350	38	
	10	High alloyed steel, and tool steel		Annealed	200	15	○
	11			Quenched & Tempered	325	35	
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○
	13		Martensitic	Quenched & Tempered	240	23	○
	14		Austenitic		180	10	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○
	16		Pearlitic (Martensitic)		260	26	○
	17	Nodular cast iron	Ferritic		160	3	○
	18		Pearlitic		250	25	
	19	Malleable cast iron	Ferritic		130		○
	20		Pearlitic		230	21	
N	21	Aluminum-wrought alloy	Not Curable		60		○
	22		Curable	Hardened	100		○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○
	24		≤ 12% Si, Curable	Hardened	90		
	25		> 12% Si, Not Curable		130		
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		
	27		CuZn, CuSnZn (Brass)		90		
	28		CuSn, lead-free copper and electrolytic copper		100		
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○
	30		Rubber, Wood, etc.				
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	
	32			Cured	280	30	
	33		Ni or Co Based	Annealed	250	25	
	34			Cured	350	38	
	35			Cast	320	34	
	36	Titanium Alloys	Pure Titanium		400 Rm		○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		
H	38	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

SUPER-GP DRILLS

DSH105 SERIES

SUPER HSS, SUPER-GP DRILLS (DIN 338)

JOBBER

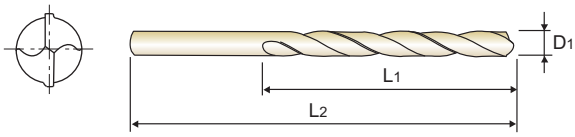
SUPER HSS, SUPER-GP DRILLS (DIN 338) — *KURZ*

Forets SUPER-GP Super HSS, queue cylindrique (DIN 338) — *COURTE*

PUNTA SUPER-GP DRILL, IN SUPER-HSS, GAMBO CILINDRICO (DIN 338) — *CORTA*

- ▶Surface treatment: Steam Tempered (Black Oxide Finish)
- ▶Applications: Excellent tool performance in steels, cast iron, alloy steels and malleable cast iron.
- ▶Special HSS improves toughness, wear resistance as well as extends dramatically the tool life.
- ▶All applications regardless of machine condition: Good or Poor.

- ▶Oberflächenbehandlung: Dampfgehärtet (Schwarze Oxydschicht)
- ▶Anwendungen: Ausgezeichnete Leistung bei Stählen, Gusseisen, legierten Stählen und Temperguss.
- ▶Spezial-HSS verbessert Zähigkeit, Verschleissfestigkeit und verlängert drastisch die Standzeit.
- ▶Alle Anwendungen unabhängig vom Maschinenzustand: Gut oder schlecht.



DIN 338 | SUPER HSS | 30° | h8 | 118° | Vap

p.A225

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
** DSH105099	9.9	87	133
** DSH105100	10.0	87	133
** DSH105101	10.1	87	133
** DSH105102	10.2	87	133
** DSH105105	10.5	87	133
** DSH105107	10.7	94	142
** DSH105108	10.8	94	142
** DSH105109	10.9	94	142
** DSH105110	11.0	94	142
** DSH105112	11.2	94	142
** DSH105113	11.3	94	142
** DSH105114	11.4	94	142
** DSH105117	11.7	94	142
** DSH105118	11.8	94	142
** DSH105119	11.9	101	151
** DSH105120	12.0	101	151
** DSH105122	12.2	101	151
** DSH105125	12.5	101	151
** DSH105126	12.6	101	151
** DSH105130	13.0	101	151

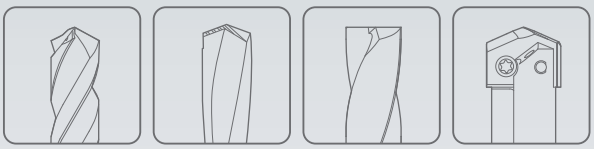
* 10pcs per package
** 5pcs per package

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

HSS, HSS-E & HSS Co8

STRAIGHT SHANK DRILLS

BOHRER MIT ZYLINDERSCHAFT

- For General Purpose (Soft &Tough Materials)
- Für allgemeine Anwendungen (weiche & zähe Materialien)

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	D2107	D1107	D2105
STANDARD	DIN 1897	DIN 1897	DIN 338
LENGTH	STUB	STUB	JOBBER
SIZE MIN	D1.0	D1.1	D1.0
SIZE MAX	D30.0	D13.0	D20.0
PAGE	A232	A235	A237
SURFACE TREATMENT	Gold Coloring	Vap	Gold Coloring

HSS, HSS-E & HSS Co8
STRAIGHT SHANK DRILLS

For General Purpose (Soft &Tough Materials)

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A270

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	D2107	D1107	D2105
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	○	○	○
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	○	○	○
	8			Quenched & Tempered	300	32	○	○	○
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	○	◎
	13		Martensitic	Quenched & Tempered	240	23	○	○	○
	14		Austenitic		180	10	○	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○
	18		Pearlitic		250	25			
	19	Malleable cast iron	Ferritic		130		○	○	○
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○
	22		Curable	Hardened	100		○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○	○	○
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	DH100 DL510	DH100 DL508	DH100 DL509
STANDARD	DIN 1897	DIN 338	DIN 340
LENGTH	STUB	JOBBER	LONG
SIZE MIN	D2.0	D2.0	D2.0
SIZE MAX	D20.0	D16.0	D12.0
PAGE	A257	A259	A261
SURFACE TREATMENT	Bright		

HSS-E STRAIGHT SHANK DRILLS

For General Purpose (Soft &Tough Materials)

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A272

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DH100 DL510	DH100 DL508	DH100 DL509
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	○	○	○
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	○	○	○
	8			Quenched & Tempered	300	32	○	○	○
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○
	18		Pearlitic		250	25	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○
	20		Pearlitic		230	21	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

STRAIGHT SHANK DRILLS

D2107 SERIES

HSS Co8, STRAIGHT SHANK TWIST DRILLS

STUB

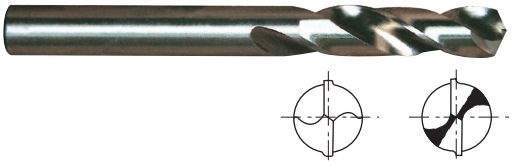
HSS Co8, SPIRALBOHRER mit ZYLINDERSCHAFT — *EXTRA KURZ*

Forets HSS Co8, queue cylindrique, Forme C, série extra-courte — *EXTRA-COURTE*

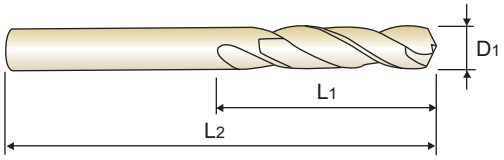
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS Co8 — *EXTRA CORTA*

▶**Surface treatment** : Coloring(Gold color)
▶**Application** : Suitable for drilling thin materials with portable electric drills.
Special twist drills for automatic and turret lathes

▶**Oberflächenbehandlung** : Coloring(Goldfarbe)
▶**Verwendung** : Sonderbohrer zum Einsatz auf Automaten und Revolverdrehbänken. Geeignet für den Einsatz in Handbohrmaschinen zum Bohren von dünnwandigem Material.



under 1.6mm 1.6mm & over



DIN 1897 | HSS Co8 | 33° | h8 | 135° | Gold Coloring

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2107010	1.0	6	26
D2107011	1.1	7	28
D2107012	1.2	8	30
D2107912	1.25	8	30
D2107013	1.3	8	30
D2107014	1.4	9	32
D2107015	1.5	9	32
D2107016	1.6	10	34
D2107017	1.7	10	34
D2107917	1.75	11	36
D2107018	1.8	11	36
D2107019	1.9	11	36
D2107020	2.0	12	38
D2107021	2.1	12	38
D2107922	2.25	13	40
D2107023	2.3	13	40
D2107024	2.4	14	43
D2107025	2.5	14	43
D2107026	2.6	14	43
D2107027	2.7	16	46
D2107927	2.75	16	46
D2107028	2.8	16	46
D2107029	2.9	16	46
D2107030	3.0	16	46
D2107031	3.1	18	49
D2107032	3.2	18	49

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2107932	3.25	18	49
D2107033	3.3	18	49
D2107034	3.4	20	52
D2107035	3.5	20	52
D2107036	3.6	20	52
D2107037	3.7	20	52
D2107937	3.75	20	52
D2107038	3.8	22	55
D2107039	3.9	22	55
D2107040	4.0	22	55
D2107041	4.1	22	55
D2107042	4.2	22	55
D2107942	4.25	22	55
D2107043	4.3	24	58
D2107044	4.4	24	58
D2107045	4.5	24	58
D2107046	4.6	24	58
D2107946	4.65	24	58
D2107047	4.7	24	58
D2107947	4.75	24	58
D2107048	4.8	26	62
D2107049	4.9	26	62
D2107050	5.0	26	62
D2107051	5.1	26	62
D2107052	5.2	26	62
D2107952	5.25	26	62

▶ HSS-E(DL107) is available on your request.
▶ TiN(D4107), TiCN(D7107) and TiAlN(DQ107) are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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YG-1 CO., LTD.

STRAIGHT SHANK DRILLS

D2107 SERIES

HSS Co8, STRAIGHT SHANK TWIST DRILLS

STUB

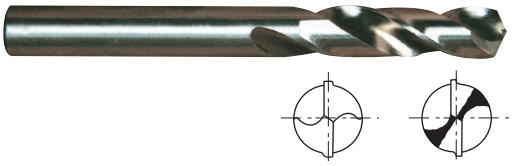
HSS Co8, SPIRALBOHRER mit ZYLINDERSCHAFT — *EXTRA KURZ*

Forets HSS Co8, queue cylindrique, Forme C, série extra-courte — *EXTRA-COURTE*

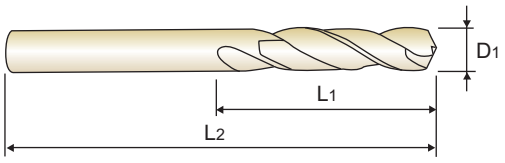
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS Co8 — *EXTRA CORTA*

▶**Surface treatment** : Coloring(Gold color)
▶**Application** : Suitable for drilling thin materials with portable electric drills.
Special twist drills for automatic and turret lathes

▶**Oberflächenbehandlung** : Coloring(Goldfarbe)
▶**Verwendung** : Sonderbohrer zum Einsatz auf Automaten und Revolverdrehbänken. Geeignet für den Einsatz in Handbohrmaschinen zum Bohren von dünnwandigem Material.



under 1.6mm 1.6mm & over



DIN 1897 | HSS Co8 | 33° | h8 | 135° | Gold Coloring

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2107099	9.9	43	89
D2107100	10.0	43	89
D2107102	10.2	43	89
D2107802	10.25	43	89
D2107105	10.5	43	89
D2107807	10.75	47	95
D2107110	11.0	47	95
D2107812	11.25	47	95
D2107115	11.5	47	95
D2107817	11.75	47	95
D2107118	11.8	47	95
D2107120	12.0	51	102
D2107822	12.25	51	102
D2107125	12.5	51	102
D2107827	12.75	51	102
D2107130	13.0	51	102
D2107832	13.25	54	107
D2107135	13.5	54	107
D2107837	13.75	54	107
D2107138	13.8	54	107
D2107140	14.0	54	107
D2107842	14.25	56	111
D2107145	14.5	56	111
D2107847	14.75	56	111
D2107150	15.0	56	111
D2107852	15.25	58	115
D2107155	15.5	58	115
D2107857	15.75	58	115
D2107160	16.0	58	115
D2107862	16.25	60	119

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2107165	16.5	60	119
D2107867	16.75	60	119
D2107170	17.0	60	119
D2107872	17.25	62	123
D2107175	17.5	62	123
D2107877	17.75	62	123
D2107180	18.0	62	123
D2107882	18.25	64	127
D2107185	18.5	64	127
D2107887	18.75	64	127
D2107190	19.0	64	127
D2107892	19.25	66	131
D2107195	19.5	66	131
D2107897	19.75	66	131
D2107200	20.0	66	131
D2107205	20.5	68	136
D2107210	21.0	68	136
D2107215	21.5	70	141
D2107220	22.0	70	141
D2107225	22.5	72	146
D2107230	23.0	72	146
D2107235	23.5	72	146
D2107240	24.0	75	151
D2107245	24.5	75	151
D2107250	25.0	75	151
D2107260	26.0	78	156
D2107270	27.0	81	162
D2107280	28.0	81	162
D2107290	29.0	84	168
D2107300	30.0	84	168

▶ HSS-E(DL107) is available on your request.
▶ TiN(D4107), TiCN(D7107) and TiAlN(DQ107) are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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YG-1 CO., LTD.

STRAIGHT SHANK DRILLS

D1107 SERIES

HSS, STRAIGHT SHANK TWIST DRILLS

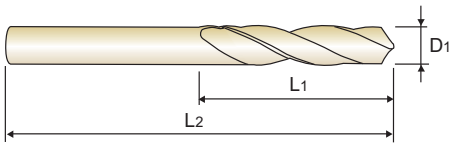
STUB

HSS, SPIRALBOHRER mit ZYLINDERSCHAFT
Forets HSS, queue cylindrique, série extra-courte
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS

EXTRA KURZ
EXTRA-COURTE
EXTRA CORTA

▶**Surface treatment** : Steam Tempered(Black Oxide Finish)
▶**Application** : Suitable for drilling thin materials with portable electric drills.
Special twist drills for automatic and turret lathes.

▶**Oberflächenbehandlung** : Steam Homo(Scwarzoxidation)
▶**Verwendung** : Sonderbohrer zum Einsatz auf Automaten und Revolverdrehbänken. Geeignet für den Einsatz in Handbohrmaschinen zum Bohren von dünnwandigem Material.



DIN 1897 | HSS | N 20~30° | h8 | 118° | Vap

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1107065	6.5	31	70
D1107066	6.6	31	70
D1107067	6.7	31	70
D1107967	6.75	34	74
D1107068	6.8	34	74
D1107069	6.9	34	74
D1107070	7.0	34	74
D1107071	7.1	34	74
D1107072	7.2	34	74
D1107073	7.3	34	74
D1107074	7.4	34	74
D1107075	7.5	34	74
D1107076	7.6	37	79
D1107077	7.7	37	79
D1107977	7.75	37	79
D1107078	7.8	37	79
D1107079	7.9	37	79
D1107080	8.0	37	79
D1107081	8.1	37	79
D1107082	8.2	37	79
D1107982	8.25	37	79
D1107083	8.3	37	79
D1107084	8.4	37	79
D1107085	8.5	37	79
D1107087	8.7	40	84
D1107987	8.75	40	84
D1107088	8.8	40	84
D1107089	8.9	40	84

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1107090	9.0	40	84
D1107091	9.1	40	84
D1107092	9.2	40	84
D1107992	9.25	40	84
D1107093	9.3	40	84
D1107094	9.4	40	84
D1107095	9.5	40	84
D1107096	9.6	43	89
D1107097	9.7	43	89
D1107997	9.75	43	89
D1107098	9.8	43	89
D1107099	9.9	43	89
D1107100	10.0	43	89
D1107802	10.25	43	89
D1107105	10.5	43	89
D1107807	10.75	47	95
D1107110	11.0	47	95
D1107812	11.25	47	95
D1107115	11.5	47	95
D1107817	11.75	47	95
D1107120	12.0	51	102
D1107822	12.25	51	102
D1107125	12.5	51	102
D1107827	12.75	51	102
D1107130	13.0	51	102

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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STRAIGHT SHANK DRILLS

D2105 SERIES

HSS Co8, STRAIGHT SHANK TWIST DRILLS

JOBBER

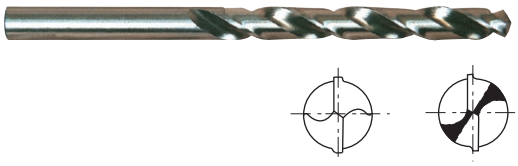
HSS Co8, SPIRALBOHRER mit ZYLINDERSCHAFT — *KURZ*

Forets HSS Co8, queue cylindrique, Forme C, série courte — *COURTE*

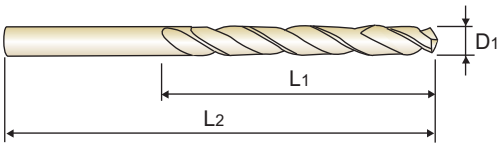
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS Co8 — *CORTA*

▶**Surface treatment** : Coloring(Gold color)
▶**Application** : Drilling stainless steels and difficult - to - cut materials such as titanium and inconel.

▶**Oberflächenbehandlung** : Coloring(Goldfarbe)
▶**Verwendung** : Zum Bohren von rostfreien und austenitischen. Stählen, schwerzerspanbaren Werkstoffen wie Titan und Inconel.



under 1.6mm 1.6mm & over



DIN 338 | HSS Co8 | 33° | h8 | 135° | Gold Coloring

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2105054	5.4	57	93
D2105055	5.5	57	93
D2105056	5.6	57	93
D2105057	5.7	57	93
D2105957	5.75	57	93
D2105058	5.8	57	93
D2105059	5.9	57	93
D2105060	6.0	57	93
D2105061	6.1	63	101
D2105062	6.2	63	101
D2105962	6.25	63	101
D2105063	6.3	63	101
D2105064	6.4	63	101
D2105065	6.5	63	101
D2105066	6.6	63	101
D2105067	6.7	63	101
D2105967	6.75	69	109
D2105068	6.8	69	109
D2105069	6.9	69	109
D2105070	7.0	69	109
D2105071	7.1	69	109
D2105072	7.2	69	109
D2105972	7.25	69	109
D2105073	7.3	69	109
D2105074	7.4	69	109
D2105075	7.5	69	109

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2105076	7.6	75	117
D2105077	7.7	75	117
D2105078	7.8	75	117
D2105079	7.9	75	117
D2105080	8.0	75	117
D2105081	8.1	75	117
D2105082	8.2	75	117
D2105982	8.25	75	117
D2105083	8.3	75	117
D2105084	8.4	75	117
D2105085	8.5	75	117
D2105086	8.6	81	125
D2105087	8.7	81	125
D2105987	8.75	81	125
D2105088	8.8	81	125
D2105089	8.9	81	125
D2105090	9.0	81	125
D2105091	9.1	81	125
D2105092	9.2	81	125
D2105992	9.25	81	125
D2105093	9.3	81	125
D2105094	9.4	81	125
D2105095	9.5	81	125
D2105096	9.6	87	133
D2105097	9.7	87	133
D2105098	9.8	87	133

▶ TiN(D4105), TiCN(D7105) and TiAlN(DQ105) are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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STRAIGHT SHANK DRILLS

DL105 SERIES

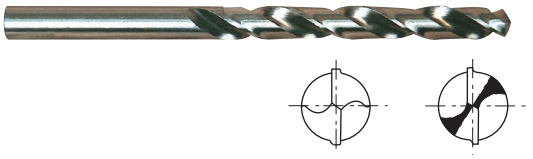
HSS-E, STRAIGHT SHANK TWIST DRILLS

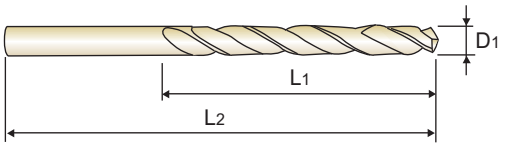
JOBBER

HSS-E, SPIRALBOHRER mit ZYLINDERSCHAFT — **KURZ**
Forets HSS-E, queue cylindrique, Forme C, série courte — **COURTE**
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS - E — **CORTA**

▶**Surface treatment** : Coloring(Gold color)
▶**Application** : Drilling stainless steels and difficult - to - cut materials such as titanium and inconel.

▶**Oberflächenbehandlung** : Coloring(Goldfarbe)
▶**Verwendung** : Zum Bohren von rostfreien und austenitischen. Stählen, schwerzerspanbaren Werkstoffen wie Titan und Inconel.





DIN 338 | HSS-E | 33° | h8 | 135° | Gold Coloring

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL105010	1.0	12	34
DL105011	1.1	14	36
DL105012	1.2	16	38
DL105912	1.25	16	38
DL105013	1.3	16	38
DL105014	1.4	18	40
DL105015	1.5	18	40
DL105016	1.6	20	43
DL105017	1.7	20	43
DL105018	1.8	22	46
DL105019	1.9	22	46
DL105020	2.0	24	49
DL105021	2.1	24	49
DL105022	2.2	27	53
DL105922	2.25	27	53
DL105023	2.3	27	53
DL105024	2.4	30	57
DL105025	2.5	30	57
DL105026	2.6	30	57
DL105027	2.7	33	61
DL105028	2.8	33	61
DL105029	2.9	33	61
DL105030	3.0	33	61
DL105031	3.1	36	65
DL105032	3.2	36	65
DL105932	3.25	36	65

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL105033	3.3	36	65
DL105034	3.4	39	70
DL105035	3.5	39	70
DL105036	3.6	39	70
DL105037	3.7	39	70
DL105937	3.75	39	70
DL105038	3.8	43	75
DL105039	3.9	43	75
DL105040	4.0	43	75
DL105041	4.1	43	75
DL105042	4.2	43	75
DL105942	4.25	43	75
DL105043	4.3	47	80
DL105044	4.4	47	80
DL105045	4.5	47	80
DL105046	4.6	47	80
DL105047	4.7	47	80
DL105947	4.75	47	80
DL105048	4.8	52	86
DL105049	4.9	52	86
DL105050	5.0	52	86
DL105051	5.1	52	86
DL105052	5.2	52	86
DL105952	5.25	52	86
DL105053	5.3	52	86
DL105054	5.4	57	93

▶ TiN(DN105), TiCN(DX105) and TiAlN(DT105) are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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STRAIGHT SHANK DRILLS

DL105 SERIES

HSS-E, STRAIGHT SHANK TWIST DRILLS

JOBBER

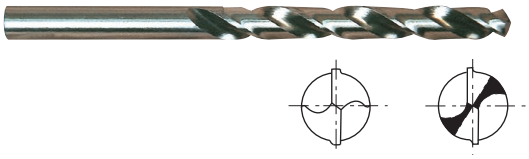
HSS-E, SPIRALBOHRER mit ZYLINDERSCHAFT — *KURZ*

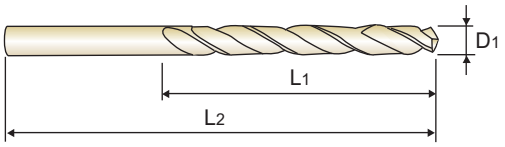
Forets HSS-E, queue cylindrique, Forme C, série courte — *COURTE*

PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS - E — *CORTA*

▶**Surface treatment** : Coloring(Gold color)
▶**Application** : Drilling stainless steels and difficult - to - cut materials such as titanium and inconel.

▶**Oberflächenbehandlung** : Coloring(Goldfarbe)
▶**Verwendung** : Zum Bohren von rostfreien und austenitischen. Stählen, schwerzerspanbaren Werkstoffen wie Titan und Inconel.





DIN 338 | HSS-E | 33° | h8 | 135° | Gold Coloring

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL105110	11.0	94	142
DL105115	11.5	94	142
DL105120	12.0	101	151
DL105125	12.5	101	151
DL105130	13.0	101	151
DL105135	13.5	108	160
DL105140	14.0	108	160
DL105145	14.5	114	169
DL105150	15.0	114	169
DL105155	15.5	120	178
DL105160	16.0	120	178
DL105165	16.5	125	184
DL105170	17.0	125	184
DL105175	17.5	130	191

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL105180	18.0	130	191
DL105185	18.5	135	198
DL105190	19.0	135	198
DL105195	19.5	140	205
DL105200	20.0	140	205

▶ TiN(DN105), TiCN(DX105) and TiAlN(DT105) are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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STRAIGHT SHANK DRILLS

D1105 SERIES

HSS, STRAIGHT SHANK TWIST DRILLS

JOBBER

HSS, SPIRALBOHRER mit ZYLINDERSCHAFT — *KURZ*

Forets HSS, queue cylindrique, série courte — *COURTE*

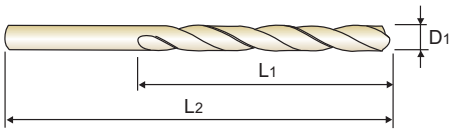
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS — *CORTA*

▶**Surface treatment** : Steam Tempered(Black Oxide Finish)
Bright Finish under 2mm

▶**Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron and graphite.

▶**Oberflächenbehandlung** : Steam Homo(Scwarzoxidation)
Helle Beschaffenheit unter 2mm

▶**Verwendung** : Zum Bohren von Stahl und Stahlguß, Grauguß, Temperguß, Sphäroguß, Sintereisen, Graphite.



DIN 338 | HSS | N 20~30° | h8 | 118° | Vap

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1105033	3.3	36	65
D1105933	3.35	36	65
D1105034	3.4	39	70
D1105934	3.45	39	70
D1105035	3.5	39	70
D1105935	3.55	39	70
D1105036	3.6	39	70
D1105936	3.65	39	70
D1105037	3.7	39	70
D1105937	3.75	39	70
D1105038	3.8	43	75
D1105938	3.85	43	75
D1105039	3.9	43	75
D1105939	3.95	43	75
D1105040	4.0	43	75
D1105940	4.05	43	75
D1105041	4.1	43	75
D1105941	4.15	43	75
D1105042	4.2	43	75
D1105942	4.25	43	75
D1105043	4.3	47	80
D1105943	4.35	47	80
D1105044	4.4	47	80
D1105944	4.45	47	80
D1105045	4.5	47	80
D1105945	4.55	47	80

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1105046	4.6	47	80
D1105946	4.65	47	80
D1105047	4.7	47	80
D1105947	4.75	47	80
D1105048	4.8	52	86
D1105948	4.85	52	86
D1105049	4.9	52	86
D1105949	4.95	52	86
D1105050	5.0	52	86
D1105950	5.05	52	86
D1105051	5.1	52	86
D1105951	5.15	52	86
D1105052	5.2	52	86
D1105952	5.25	52	86
D1105053	5.3	52	86
D1105953	5.35	57	93
D1105054	5.4	57	93
D1105954	5.45	57	93
D1105055	5.5	57	93
D1105955	5.55	57	93
D1105056	5.6	57	93
D1105956	5.65	57	93
D1105057	5.7	57	93
D1105957	5.75	57	93
D1105058	5.8	57	93
D1105958	5.85	57	93

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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STRAIGHT SHANK DRILLS

D1105 SERIES

HSS, STRAIGHT SHANK TWIST DRILLS

JOBBER

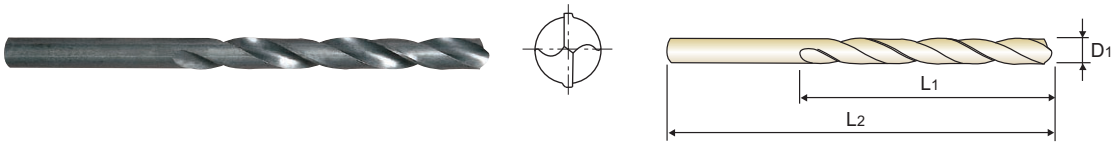
HSS, SPIRALBOHRER mit ZYLINDERSCHAFT — *KURZ*
Forets HSS, queue cylindrique, série courte — *COURTE*
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS — *CORTA*

▶**Surface treatment** : Steam Tempered(Black Oxide Finish)
Bright Finish under 2mm

▶**Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron and graphite.

▶**Oberflächenbehandlung** : Steam Homo(Scwarzoxidation)
Helle Beschaffenheit unter 2mm

▶**Verwendung** : Zum Bohren von Stahl und Stahlguß, Grauguß, Temperguß, Sphäroguß, Sintereisen, Graphite.



DIN 338 | HSS | N 20~30° | h8 | 118° | Vap

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1105089	8.9	81	125
D1105090	9.0	81	125
D1105091	9.1	81	125
D1105092	9.2	81	125
D1105992	9.25	81	125
D1105093	9.3	81	125
D1105094	9.4	81	125
D1105095	9.5	81	125
D1105096	9.6	87	133
D1105097	9.7	87	133
D1105997	9.75	87	133
D1105098	9.8	87	133
D1105099	9.9	87	133
D1105100	10.0	87	133
D1105101	10.1	87	133
D1105102	10.2	87	133
D1105802	10.25	87	133
D1105103	10.3	87	133
D1105104	10.4	87	133
D1105105	10.5	87	133
D1105106	10.6	87	133
D1105107	10.7	94	142
D1105807	10.75	94	142
D1105108	10.8	94	142
D1105109	10.9	94	142
D1105110	11.0	94	142

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1105111	11.1	94	142
D1105112	11.2	94	142
D1105812	11.25	94	142
D1105113	11.3	94	142
D1105114	11.4	94	142
D1105115	11.5	94	142
D1105116	11.6	94	142
D1105117	11.7	94	142
D1105817	11.75	94	142
D1105118	11.8	94	142
D1105119	11.9	101	151
D1105120	12.0	101	151
D1105121	12.1	101	151
D1105122	12.2	101	151
D1105822	12.25	101	151
D1105123	12.3	101	151
D1105124	12.4	101	151
D1105125	12.5	101	151
D1105126	12.6	101	151
D1105127	12.7	101	151
D1105827	12.75	101	151
D1105128	12.8	101	151
D1105129	12.9	101	151
D1105130	13.0	101	151
D1105832	13.25	108	160
D1105135	13.5	108	160

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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STRAIGHT SHANK DRILLS

D1125 SERIES

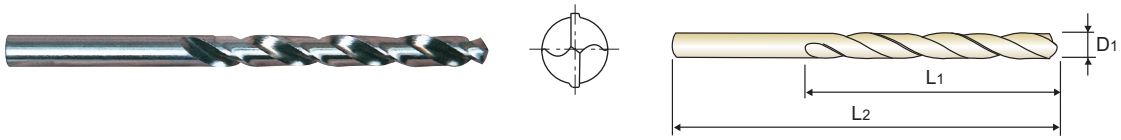
HSS, STRAIGHT SHANK TWIST DRILLS

JOBBER

HSS, SPIRALBOHRER mit ZYLINDERSCHAFT — *KURZ*
Forets HSS, queue cylindrique, série courte — *COURTE*
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS — *CORTA*

▶**Surface treatment** : Bright Finish
▶**Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron and graphite.

▶**Oberflächenbehandlung** : Helle Beschaffenheit
▶**Verwendung** : Zum Bohren von Stahl und Stahlguß, Grauguß, Temperguß, Sphäroguß, Sintereisen, Graphite.



DIN 338 | HSS | N 20~30° | h8 | 118° | Bright

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1125020	2.0	24	49
D1125021	2.1	24	49
D1125022	2.2	27	53
D1125023	2.3	27	53
D1125024	2.4	30	57
D1125025	2.5	30	57
D1125028	2.8	33	61
D1125030	3.0	33	61
D1125032	3.2	36	65
D1125034	3.4	39	70
D1125035	3.5	39	70
D1125037	3.7	39	70
D1125038	3.8	43	75
D1125040	4.0	43	75
D1125041	4.1	43	75
D1125042	4.2	43	75
D1125043	4.3	47	80
D1125044	4.4	47	80
D1125045	4.5	47	80
D1125046	4.6	47	80
D1125047	4.7	47	80
D1125048	4.8	52	86
D1125049	4.9	52	86
D1125050	5.0	52	86
D1125052	5.3	52	86
D1125054	5.4	57	93

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1125055	5.5	57	93
D1125056	5.6	57	93
D1125057	5.7	57	93
D1125058	5.8	57	93
D1125059	5.9	57	93
D1125060	6.0	57	93
D1125061	6.1	63	101
D1125062	6.2	63	101
D1125063	6.3	63	101
D1125064	6.4	63	101
D1125065	6.5	63	101
D1125066	6.6	63	101
D1125067	6.7	63	101
D1125068	6.8	69	109
D1125070	7.0	69	109
D1125072	7.2	69	109
D1125075	7.5	69	109
D1125080	8.0	75	117
D1125082	8.2	75	117
D1125083	8.3	75	117
D1125085	8.5	75	117
D1125087	8.7	81	125
D1125090	9.0	81	125
D1125092	9.2	81	125
D1125095	9.5	81	125
D1125100	10.0	87	133

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

STRAIGHT SHANK DRILLS

D2104 SERIES

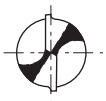
HSS Co8, STRAIGHT SHANK TWIST DRILLS

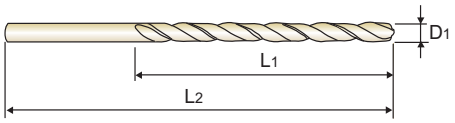
LONG

HSS Co8, SPIRALBOHRER mit ZYLINDERSCHAFT — *LANG*
Forets HSS Co8, queue cylindrique, série longue — *LONGUE*
PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS Co8 — *LUNGA*

▶**Surface treatment** : Coloring(Gold color)
▶**Application** : Drilling deep holes in stainless steels and difficult - to - cut materials such as titanium and inconel.

▶**Oberflächenbehandlung** : Coloring(Goldfarbe)
▶**Verwendung** : Für Bohrarbeiten mit Bohrungen oder an tief liegenden Stellen. Zum Bohren von rostfreien und austenitischen Stählen, schwerzerspanbaren Werkstoffen wie Titan und Inconel.





DIN 340 | HSS Co8 | 33° | h8 | 135° | Gold Coloring

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2104020	2.0	56	85
D2104021	2.1	56	85
D2104022	2.2	59	90
D2104023	2.3	59	90
D2104024	2.4	62	95
D2104025	2.5	62	95
D2104026	2.6	62	95
D2104027	2.7	66	100
D2104028	2.8	66	100
D2104029	2.9	66	100
D2104030	3.0	66	100
D2104031	3.1	69	106
D2104032	3.2	69	106
D2104033	3.3	69	106
D2104034	3.4	73	112
D2104035	3.5	73	112
D2104036	3.6	73	112
D2104037	3.7	73	112
D2104038	3.8	78	119
D2104039	3.9	78	119
D2104040	4.0	78	119
D2104041	4.1	78	119
D2104042	4.2	78	119
D2104043	4.3	82	126
D2104044	4.4	82	126
D2104045	4.5	82	126

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2104046	4.6	82	126
D2104047	4.7	82	126
D2104048	4.8	87	132
D2104049	4.9	87	132
D2104050	5.0	87	132
D2104051	5.1	87	132
D2104052	5.2	87	132
D2104053	5.3	87	132
D2104054	5.4	91	139
D2104055	5.5	91	139
D2104056	5.6	91	139
D2104057	5.7	91	139
D2104058	5.8	91	139
D2104059	5.9	91	139
D2104060	6.0	91	139
D2104061	6.1	97	148
D2104062	6.2	97	148
D2104063	6.3	97	148
D2104064	6.4	97	148
D2104065	6.5	97	148
D2104066	6.6	97	148
D2104067	6.7	97	148
D2104068	6.8	102	156
D2104069	6.9	102	156
D2104070	7.0	102	156
D2104071	7.1	102	156

▶ HSS-E(DL104) is available on your request.
▶ TiN(D4104), TiCN(D7104) and TiAlN(DQ104) are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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STRAIGHT SHANK DRILLS

D1121 SERIES

HSS, STRAIGHT SHANK TWIST DRILLS

EXTRA LONG

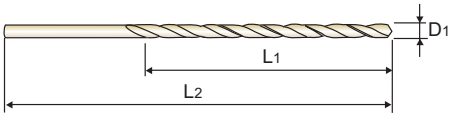
HSS, SPIRALBOHRER MIT ZYLINDERSCHAFT — ***ÜBERLANG***

Forets HSS, queue cylindrique, série extra-longue — ***EXTRA-LONGUE***

PUNTE ELICOIDALI, GAMBO CILINDRICO, HSS — ***EXTRA LUNGA***

▶**Surface treatment** : Steam Tempered(Black Oxide Finish)
▶**Application** : Designed for drilling deep holes or deeply located holes
Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron and graphite.

▶**Oberflächenbehandlung** : Steam Homo(Scwarzoxidation)
▶**Verwendung** : Standardbohrer zum Bohren extrem tiefer Löcher, zum Bohren von Stahl und Stahlguß, Grauguß, Temperguß, Sphäroguß, Sintereisen, Graphit.



DIN 1869/1 | HSS | N 20~30° | h8 | 118° | Vap

p.A270

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1121020	2.0	85	125
D1121025	2.5	95	140
D1121030	3.0	100	150
D1121035	3.5	115	165
D1121040	4.0	120	175
D1121045	4.5	125	185
D1121050	5.0	135	195
D1121055	5.5	140	205
D1121060	6.0	140	205
D1121065	6.5	150	215
D1121070	7.0	155	225
D1121075	7.5	155	225

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1121080	8.0	165	240
D1121090	9.0	175	250
D1121095	9.5	175	250
D1121100	10.0	185	265
D1121105	10.5	185	265
D1121110	11.0	195	280
D1121115	11.5	195	280
D1121120	12.0	205	295
D1121125	12.5	205	295
D1121130	13.0	205	295

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		○	○	○	○	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

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STRAIGHT SHANK DRILLS

D1100 SERIES

HSS, STRAIGHT SHANK TWIST DRILLS for BRASS/BRONZE

JOBBER

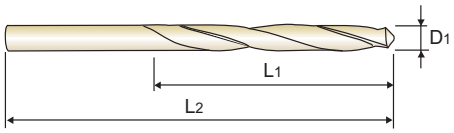
HSS, SPIRALBOHRER für MESSING/BRONZE mit ZYLINDERSCHAFT — *KURZ*

Forets HSS, queue cylindrique pour Laiton/Bronze, série courte — *COURTE*

PUNTE ELICOIDALI, GAMBO CILINDRICO PER OTTONE (HSS) — *CORTA*

▶**Application** : Drilling hard, brittle and short-chip materials. i.e., brass, bronze, phosphor bronze and magnesium alloys.

▶**Verwendung** : Zum Bohren von harten und spröden Werkstoffen wie Messing, Magnesium-Legierungen, Bronze, Phosphorbronze.



DIN 338 | HSS | N 15~20° | h8 | 118° | Bright

p.A271

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1100015	1.5	18	40
D1100017	1.7	20	43
D1100020	2.0	24	49
D1100025	2.5	30	57
D1100026	2.6	30	57
D1100030	3.0	33	61
D1100032	3.2	36	65
D1100033	3.3	36	65
D1100035	3.5	39	70
D1100037	3.7	39	70
D1100038	3.8	43	75
D1100040	4.0	43	75
D1100041	4.1	43	75
D1100045	4.5	47	80
D1100049	4.9	52	86
D1100050	5.0	52	86
D1100051	5.1	52	86
D1100055	5.5	57	93
D1100058	5.8	57	93
D1100059	5.9	57	93
D1100060	6.0	57	93
D1100062	6.2	63	101
D1100063	6.3	63	101
D1100064	6.4	63	101
D1100066	6.6	63	101
D1100067	6.7	63	101
D1100068	6.8	69	109
D1100070	7.0	69	109

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1100072	7.2	69	109
D1100073	7.3	69	109
D1100075	7.5	69	109
D1100076	7.6	75	117
D1100077	7.7	75	117
D1100078	7.8	75	117
D1100079	7.9	75	117
D1100080	8.0	75	117
D1100083	8.3	75	117
D1100084	8.4	75	117
D1100085	8.5	75	117
D1100087	8.7	81	125
D1100088	8.8	81	125
D1100089	8.9	81	125
D1100090	9.0	81	125
D1100091	9.1	81	125
D1100092	9.2	81	125
D1100093	9.3	81	125
D1100094	9.4	81	125
D1100095	9.5	81	125
D1100096	9.6	87	133
D1100097	9.7	87	133
D1100098	9.8	87	133
D1100099	9.9	87	133
D1100100	10.0	87	133
D1100120	12.0	101	151

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended							◎	◎													

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YG-1 CO., LTD.

STRAIGHT SHANK DRILLS

D1106 SERIES

HSS, STRAIGHT SHANK TWIST DRILLS for ALUMINUM

JOBBER

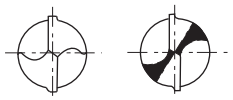
HSS, SPIRALBOHRER für ALUMINIUM mit ZYLINDERSCHAFT — *KURZ*

Forets HSS, queue cylindrique pour ALU, Forme C, série courte — *COURTE*

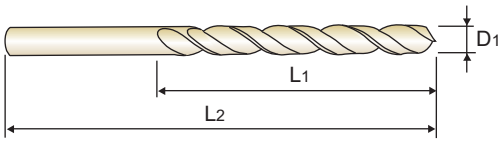
PUNTE ELICOIDALI, GAMBO CILINDRICO, PER ALLUMINIO (HSS) — *CORTA*

▶**Application** : Drilling hard, brittle and short-chip materials. i.e., brass, bronze, phosphor bronze aluminum and magnesium alloys.

▶**Verwendung** : Zum Bohren von harten und spröden Werkstoffen wie Messing, Magnesium-Legierungen, Bronze, Phosphorbronze.



under 1.6mm 1.6mm & over



DIN 338 | HSS | 38° | h8 | 135° | Bright

p.A271

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1106070	7.0	69	109
D1106071	7.1	69	109
D1106072	7.2	69	109
D1106073	7.3	69	109
D1106074	7.4	69	109
D1106075	7.5	69	109
D1106076	7.6	75	117
D1106077	7.7	75	117
D1106079	7.9	75	117
D1106080	8.0	75	117
D1106081	8.1	75	117
D1106082	8.2	75	117
D1106083	8.3	75	117
D1106084	8.4	75	117
D1106085	8.5	75	117
D1106087	8.7	81	125
D1106088	8.8	81	125
D1106089	8.9	81	125

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D1106090	9.0	81	125
D1106091	9.1	81	125
D1106092	9.2	81	125
D1106093	9.3	81	125
D1106094	9.4	81	125
D1106095	9.5	81	125
D1106096	9.6	87	133
D1106097	9.7	87	133
D1106098	9.8	87	133
D1106099	9.9	87	133
D1106100	10.0	87	133
D1106105	10.5	87	133
D1106110	11.0	94	142
D1106120	12.0	101	151
D1106125	12.5	101	151
D1106130	13.0	101	151

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎																	

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STRAIGHT SHANK DRILLS

DL510 SERIES

HSS-E, STRAIGHT SHANK TWIST DRILLS for DEEP HOLES

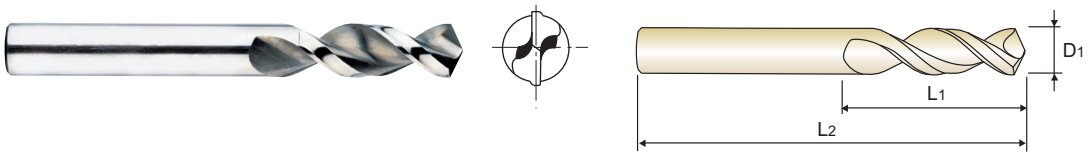
STUB

HSS-E, SPIRALBOHRER für TIEFLOCH mit ZYLINDERSCHAFT
Forets HSS-E, queue cylindrique pour perçage profond, série extra-courte
PUNTA IN HSS-E, GAMBO CILINDRICO PER FORI NON - STOP

EXTRA KURZ
EXTRA-COURTE
EXTRA CORTA

▶**Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, special aluminum or magnesium alloys.

▶**Verwendung** : Zum Bohren von legiertem und unlegiertem stahl, Grauguß, Temperguß, Sphäroguß, Druckguß, Alu-Legierungen kurzspanend, Bronze, Messing zäh, Neusilber.



DIN 1897 | HSS-E | 42° | h8 | 130° | Bright

p.A272

▶ **DH100** worm pattern drills

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL510085	8.5	37	79
DL510086	8.6	40	84
DL510087	8.7	40	84
DL510089	8.9	40	84
DL510090	9.0	40	84
DL510092	9.2	40	84
DL510094	9.4	40	84
DL510095	9.5	40	84
DL510097	9.7	43	89
DL510100	10.0	43	89
DL510102	10.2	43	89
DL510105	10.5	43	89
DL510108	10.8	47	95
DL510112	11.2	47	95
DL510118	11.8	47	95
DL510120	12.0	51	102
DL510130	13.0	51	102
DL510135	13.5	54	107
DL510140	14.0	54	107
DL510145	14.5	56	111

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL510150	15.0	56	111
DL510155	15.5	58	115
DL510160	16.0	58	115
DL510165	16.5	60	119
DL510170	17.0	60	119
DL510175	17.5	62	123
DL510180	18.0	62	123
DL510185	18.5	64	127
DL510190	19.0	64	127
DL510200	20.0	66	131

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○					○	○	○	○	○	○

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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YG-1 CO., LTD.

STRAIGHT SHANK DRILLS

DL508 SERIES

HSS-E, STRAIGHT SHANK TWIST DRILLS

JOBBER

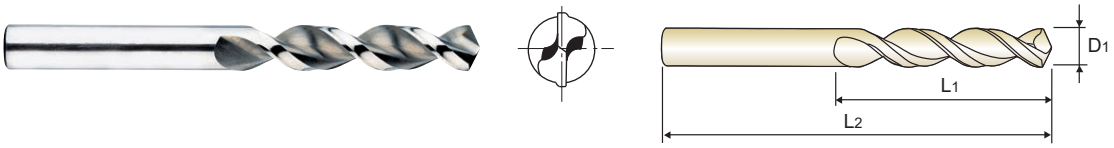
HSS-E, SPIRALBOHRER für TIEFLOCH mit ZYLINDERSCHAFT — *KURZ*

Forets HSS-E, queue cylindrique pour perçage profond, série courte — *COURTE*

PUNTA IN HSS-E, GAMBO CILINDRICO PER FORI NON - STOP — *CORTA*

▶**Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, special aluminum or magnesium alloys.

▶**Verwendung** : Zum Bohren von legiertem und unlegiertem stahl, Grauguß, Temperguß, Sphäroguß, Druckguß, Alu-Legierungen kurzspanend, Bronze, Messing zäh, Neusilber.



DIN 338 | HSS-E | 42° | h8 | 130° | Bright

p.A272

▶ **DH100** worm pattern drills

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL508088	8.8	81	125
DL508089	8.9	81	125
DL508090	9.0	81	125
DL508091	9.1	81	125
DL508092	9.2	81	125
DL508094	9.4	81	125
DL508095	9.5	81	125
DL508096	9.6	87	133
DL508097	9.7	87	133
DL508098	9.8	87	133
DL508099	9.9	87	133
DL508100	10.0	87	133
DL508102	10.2	87	133
DL508105	10.5	87	133
DL508110	11.0	94	142
DL508115	11.5	94	142
DL508120	12.0	101	151
DL508125	12.5	101	151

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL508130	13.0	101	151
DL508135	13.5	108	160
DL508140	14.0	108	160
DL508145	14.5	114	169
DL508150	15.0	114	169
DL508155	15.5	120	178
DL508160	16.0	120	178

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○					○	○	○	○	○	○

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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STRAIGHT SHANK DRILLS

DL509 SERIES

HSS-E, STRAIGHT SHANK TWIST DRILLS for DEEP HOLES

LONG

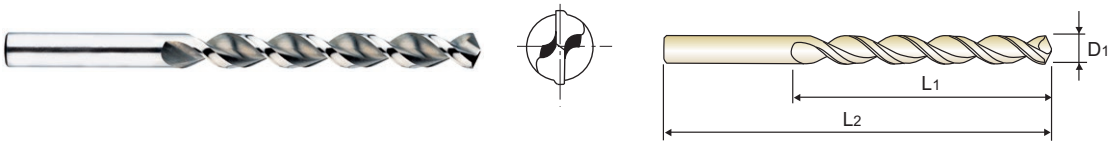
HSS-E, SPIRALBOHRER für TIEFLOCH mit ZYLINDERSCHAFT — LANG

Forets HSS-E, queue cylindrique pour perçage profond, série longue — LONGUE

PUNTA IN HSS-E, GAMBO CILINDRICO PER FORI NON - STOP — LUNGA

▶**Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, special aluminum or magnesium alloys.

▶**Verwendung** : Zum Bohren von legiertem und unlegiertem stahl, Grauguß, Temperguß, Sphäroguß, Druckguß, Alu-Legierungen kurzspanend, Bronze, Messing zäh, Neusilber.



DIN 340 | HSS-E | 42° | h8 | 130° | Bright

p.A272

▶ **DH100** worm pattern drills

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL509081	8.1	109	165
DL509084	8.4	109	165
DL509085	8.5	109	165
DL509086	8.6	115	175
DL509087	8.7	115	175
DL509088	8.8	115	175
DL509089	8.9	115	175
DL509090	9.0	115	175
DL509091	9.1	115	175
DL509092	9.2	115	175
DL509093	9.3	115	175
DL509094	9.4	115	175
DL509095	9.5	115	175
DL509097	9.7	121	184

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL509098	9.8	121	184
DL509099	9.9	121	184
DL509100	10.0	121	184
DL509102	10.2	121	184
DL509105	10.5	121	184
DL509110	11.0	128	195
DL509115	11.5	128	195
DL509120	12.0	134	205

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○					○	○	○	○	○	○

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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STRAIGHT SHANK DRILLS

DL505 SERIES

HSS-E, STRAIGHT SHANK TWIST DRILLS

JOBBER

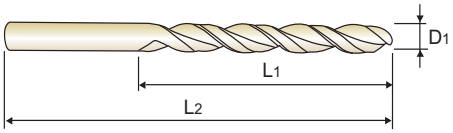
HSS-E, SPIRALBOHRER für TIEFLOCH mit ZYLINDERSCHAFT — *KURZ*

Forets HSS-E, queue cylindrique pour perçage profond, série courte — *COURTE*

PUNTA IN HSS-E, GAMBO CILINDRICO PER FORI NON - STOP — *CORTA*

▶**Surface treatment** : Steam Tempered(Black Oxide Finish)
▶**Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, special aluminum or magnesium alloys.

▶**Oberflächenbehandlung** : Steam Homo(Schwarzoxidation)
▶**Verwendung** : Zum Bohren von legiertem und unlegiertem stahl, Grauguß, Temperguß, Sphäroguß, Druckguß, Alu-Legierungen kurzspanend, Bronze, Messing zäh, Neusilber.



DIN 338 | HSS-E | 38° | h8 | 130° | Vap

p.A272

▶ **DH100** worm pattern drills

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL505087	8.7	81	125
DL505088	8.8	81	125
DL505089	8.9	81	125
DL505091	9.1	81	125
DL505092	9.2	81	125
DL505093	9.3	81	125
DL505094	9.4	81	125
DL505096	9.6	87	133
DL505097	9.7	87	133
DL505098	9.8	87	133
DL505099	9.9	87	133
DL505102	10.2	87	133
DL505105	10.5	87	133
DL505110	11.0	94	142
DL505115	11.5	94	142
DL505125	12.5	101	151
DL505128	12.8	101	151

▶ TiN(DN505), TiCN(DX505) and TiAlN(DT505) are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○					○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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YG-1 CO., LTD.

STRAIGHT SHANK DRILLS

DT692 SERIES
DT600 SERIES
DT693 SERIES

HSS-E, STRAIGHT SHANK TWIST DRILLS for DEEP HOLES

EXTRA LONG
ÜBERLANG
EXTRA-LONGUE
EXTRA LUNGA

HSS-E, SPIRALBOHRER für TIEFLOCH mit ZYLINDERSCHAFT
Forets HSS-E, queue cylindrique pour perçage profond, Forme C, série extra-longue
PUNTA IN HSS-E, GAMBO CILINDRICO PER FORI NON - STOP

▶**Surface treatment** : TiAlN coating on working area.
▶**Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, special aluminum or magnesium alloys.

▶**Verwendung** : Zum Bohren von legiertem und unlegiertem stahl, Grauguß, Temperguß, Sphäroguß, Druckguß, Alu-Legierungen kurzspanend, Bronze, Messing zäh, Neusilber.

DIN 1869/1 | DIN 1869/2 | DIN 1869/3 | HSS-E | 38° | h8 | 130° | TiAlN

p.A273

▶ **DH100** worm pattern drills

DT600 SERIES (DIN 1869/1)

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DT600020	2.0	85	125
DT600025	2.5	95	140
DT600030	3.0	100	150
DT600035	3.5	115	165
DT600040	4.0	120	175
DT600045	4.5	125	185
DT600050	5.0	135	195
DT600055	5.5	140	205
DT600060	6.0	140	205
DT600065	6.5	150	215
DT600075	7.5	155	225
DT600080	8.0	165	240
DT600085	8.5	165	240
DT600090	9.0	175	250
DT600100	10.0	185	265
DT600105	10.5	185	265

▶ TiN(DN600) and TiCN(DX600) are available on your request.

DT692 SERIES (DIN 1869/2)

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DT692030	3.0	130	190
DT692035	3.5	145	210
DT692040	4.0	150	220
DT692055	5.5	180	260
DT692060	6.0	180	260
DT692065	6.5	190	275
DT692070	7.0	200	290
DT692075	7.5	200	290
DT692080	8.0	210	305
DT692085	8.5	210	305
DT692090	9.0	220	320
DT692095	9.5	220	320
DT692100	10.0	235	340
DT692102	10.2	235	340

DT693 SERIES (DIN 1869/3)

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DT693040	4.0	190	280
DT693050	5.0	210	315
DT693060	6.0	225	330
DT693080	8.0	265	390
DT693100	10.0	295	430

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○					○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

STRAIGHT SHANK DRILLS

DL507 SERIES

HSS-E, STRAIGHT SHANK TWIST DRILLS for ALUMINUM DEEP HOLES

EXTRA LONG

HSS-E, SPIRALBOHRER für ALUMINIUM TIEFLOCH mit ZYLINDERSCHAFT — *ÜBERLANG*

Forets HSS-E, queue cylindrique pour ALU, perçage profond, série extra-longue — *EXTRA-LONGUE*

PUNTE HSS-E, GAMBO CILINDRICO PER FORATURE NON - STOP SU ALLUMINIO — *EXTRA LUNGA*

▶**Application** : Drilling deep holes in aluminum and its alloys, silumin, zinc, refined copper, wood and other soft synthetic materials.

▶**Verwendung** : Zum Bohren von weichen und langspanenden Werkstoffen wie Alu-Legierungen, Zink, Kupfer, Kunstoffe und Holz.

HSS-E | 38° | h8 | 118° | Bright

p.A273

▶DH50 worm pattern drills

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL507120	2.0	40	75
DL507220	2.0	50	100
DL507221	2.1	50	100
DL507225	2.5	50	100
DL507233	3.3	50	100
DL507235	3.5	50	100
DL507320	2.0	75	150
DL507321	2.1	75	150
DL507325	2.5	75	150
DL507327	2.7	75	150
DL507330	3.0	75	150
DL507333	3.3	75	150
DL507335	3.5	75	150
DL507340	4.0	75	150
DL507342	4.2	75	150
DL507345	4.5	75	150
DL507350	5.0	75	150
DL507355	5.5	75	150
DL507360	6.0	75	150

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
DL507430	3.0	100	200
DL507433	3.3	100	200
DL507435	3.5	100	200
DL507440	4.0	100	200
DL507442	4.2	100	200
DL507445	4.5	100	200
DL507450	5.0	100	200
DL507453	5.3	100	200
DL507455	5.5	100	200
DL507460	6.0	100	200
DL507465	6.5	100	200
DL507468	6.8	100	200
DL507470	7.0	100	200
DL507475	7.5	100	200
DL507480	8.0	100	200
DL507485	8.5	100	200
DL507490	9.0	100	200
DL507700	10.0	100	200
DL507540	4.0	150	250
DL507545	4.5	150	250

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○																			

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	○																		

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YG-1 CO., LTD.

STRAIGHT SHANK DRILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

D2107, D1107, D2105, DL105, D1105, D1125, D2104, D1121, DL109 SERIES

HSS, HSS-E & HSS Co8 COBALT DRILLS

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)										
					2.0	3.0	4.0	6.0	8.0	10.0	13.0	16.0	18.0	20.0	30.0
P	1	Non-alloy steel	30	RPM	4770	3180	2390	1590	1190	950	730	600	530	480	320
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	2		25	RPM	3980	2650	1990	1330	990	800	610	500	440	400	270
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	3		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	4		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	6	Low alloy steel	25	RPM	3980	2650	1990	1330	990	800	610	500	440	400	270
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	7		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	8		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	10	High alloyed steel, and tool steel	15	RPM	2390	1590	1190	800	600	480	370	300	270	240	160
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
M	12	Stainless steel	20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	13		15	RPM	2390	1590	1190	800	600	480	370	300	270	240	160
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	14		10	RPM	1590	1060	800	530	400	320	240	200	180	160	110
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
K	15	Grey cast iron	30	RPM	4770	3180	2390	1590	1190	950	730	600	530	480	320
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	16		25	RPM	3980	2650	1990	1330	990	800	610	500	440	400	270
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	17	Nodular cast iron	30	RPM	4770	3180	2390	1590	1190	950	730	600	530	480	320
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	19	Malleable cast iron	25	RPM	3980	2650	1990	1330	990	800	610	500	440	400	270
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
N	21	Aluminum-wrought alloy	55	RPM	8750	5840	4380	2920	2190	1750	1350	1090	970	880	580
				FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38
	22		55	RPM	8750	5840	4380	2920	2190	1750	1350	1090	970	880	580
				FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38
	23	Aluminum-cast, alloyed	40	RPM	6370	4240	3180	2120	1590	1270	980	800	710	640	420
				FEED	0.03-0.06	0.05-0.09	0.07-0.11	0.12-0.16	0.12-0.18	0.14-0.20	0.16-0.22	0.18-0.24	0.20-0.28	0.20-0.30	0.28-0.38
	29	Non Metallic Materials	20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
S	36	Titanium Alloys	10	RPM	1590	1060	800	530	400	320	240	200	180	160	110
				FEED	0.01-0.03	0.02-0.04	0.03-0.05	0.04-0.07	0.05-0.08	0.05-0.09	0.06-0.10	0.05-0.11	0.06-0.12	0.09-0.13	0.12-0.18

STRAIGHT SHANK DRILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

DL510, DL508, DL509, DL505, DL504, DL608 SERIES

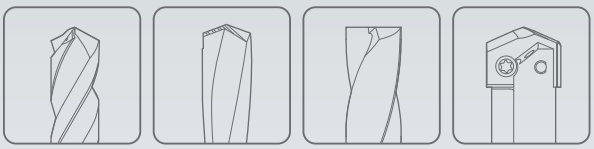
HSS-E, DH100 WORM PATTERN DRILLS

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)										
					2.0	3.0	4.0	6.0	8.0	10.0	13.0	16.0	18.0	20.0	30.0
P	1	Non-alloy steel	30	RPM	4770	3180	2390	1590	1190	950	730	600	530	480	320
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	2		25	RPM	3980	2650	1990	1330	990	800	610	500	440	400	270
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	3		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	4		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	6	Low alloy steel	25	RPM	3980	2650	1990	1330	990	800	610	500	440	400	270
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.2	0.19-0.25	0.22-0.28
	7		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.2	0.19-0.25	0.22-0.28
	8		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	10	High alloyed steel, and tool steel	15	RPM	2390	1590	1190	800	600	480	370	300	270	240	160
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
K	15	Grey cast iron	30	RPM	4770	3180	2390	1590	1190	950	730	600	530	480	320
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	16		25	RPM	3980	2650	1990	1330	990	800	610	500	440	400	270
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	17	Nodular cast iron	30	RPM	4770	3180	2390	1590	1190	950	730	600	530	480	320
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	18		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18
	19	Malleable cast iron	25	RPM	3980	2650	1990	1330	990	800	610	500	440	400	270
				FEED	0.02-0.04	0.03-0.05	0.04-0.06	0.05-0.08	0.10-0.13	0.11-0.15	0.11-0.17	0.12-0.18	0.14-0.20	0.19-0.25	0.22-0.28
	20		20	RPM	3180	2120	1590	1060	800	640	490	400	350	320	210
				FEED	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05	0.03-0.06	0.03-0.06	0.04-0.10	0.06-0.12	0.08-0.14	0.10-0.16	0.12-0.18

i-ONE DRILLS
i-DREAM DRILLS
DREAM DRILLS -PRO
DREAM DRILLS X
DREAM DRILLS -GENERAL
DREAM DRILLS -HIGH FEED
DREAM DRILLS -FLAT BOTTOM
DREAM DRILLS -INOX
DREAM DRILLS -ALU
DREAM DRILLS -MQL
DREAM DRILLS for HIGH HARDENED STEELS
GENERAL CARBIDE DRILLS
MULTI-1 DRILLS
HPD DRILLS
GOLD-P DRILLS
SUPER-GP DRILLS
STRAIGHT SHANK DRILLS
TAPER SHANK DRILLS
NC-SPOTTING DRILLS
CENTER DRILLS
SPADE DRILLS
REAMERS
COUNTER SINKS
COUNTER BORES

Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

HSS & HSS-E

MORSE TAPER SHANK DRILLS

BOHRER MIT MK

- **Morse Taper Shank Drills for Wide Applications**
- **Bohrer mit Morsekegel für breite Anwendungen**

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	DL205	D1205	D1206
STANDARD	DIN 345	DIN 345	DIN 341
LENGTH	JOBBER	JOBBER	LONG
SIZE MIN	D13.0	D5.0	D13.0
SIZE MAX	D30.0	D60.0	D30.0
PAGE	A278	A279	A282
SURFACE TREATMENT	Bright	Vap	

HSS & HSS-E
MORSE TAPER SHANK DRILLS

Morse Taper Shank Drills for Wide Applications

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A285

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	DL205	D1205	D1206
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	○	○	○
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	○	○	○
	8			Quenched & Tempered	300	32	○	○	○
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	○	○	○
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○
	18		Pearlitic		250	25	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○
	20		Pearlitic		230	21	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○
	22		Curable	Hardened	100		○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○	○	○
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

MORSE TAPER SHANK DRILLS

DL205 SERIES

HSS-E, MORSE TAPER SHANK TWIST DRILLS for HEAVY DUTY

JOBBER

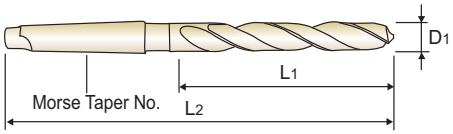
HSS-E, SPIRALBOHRER für HOHELEISTUNGEN mit MORSEKEGELSCHAFT — *KURZ*

Forets HSS-E, queue cône morse pour matériaux durs, série courte — *COURTE*

HSS-E, PUNTE ELICOIDALI, ATTACCO CM PER LAVORAZIONI GRAVOSE — *CORTA*

▶**Surface treatment** : Bright Finish
▶**Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron, graphite.

▶**Oberflächenbehandlung** : Helle Beschaffenheit
▶**Verwendung** : Zum Bohren von Stahl und Stahlguß, Grauguß, Temperguß, Sphäroguß, Sintereisen, Graphit.



DIN 345 | HSS-E | N ≈ 30° | 1 ~ 3 | h8 | 118° | Bright

p.A285

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
DL205130	13.0	101	182	1
DL205135	13.5	108	189	1
DL205140	14.0	108	189	1
DL205145	14.5	114	212	2
DL205150	15.0	114	212	2
DL205155	15.5	120	218	2
DL205160	16.0	120	218	2
DL205165	16.5	125	223	2
DL205170	17.0	125	223	2
DL205175	17.5	130	228	2
DL205180	18.0	130	228	2
DL205185	18.5	135	233	2
DL205190	19.0	135	233	2
DL205195	19.5	140	238	2
DL205200	20.0	140	238	2
DL205205	20.5	145	243	2
DL205210	21.0	145	243	2
DL205215	21.5	150	248	2

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
DL205220	22.0	150	248	2
DL205225	22.5	155	253	2
DL205230	23.0	155	253	2
DL205235	23.5	155	276	3
DL205240	24.0	160	281	3
DL205245	24.5	160	281	3
DL205250	25.0	160	281	3
DL205255	25.5	165	286	3
DL205260	26.0	165	286	3
DL205265	26.5	165	286	3
DL205270	27.0	170	291	3
DL205275	27.5	170	291	3
DL205280	28.0	170	291	3
DL205285	28.5	175	296	3
DL205290	29.0	175	296	3
DL205295	29.5	175	296	3
DL205300	30.0	175	296	3

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○		○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

MORSE TAPER SHANK DRILLS

D1205 SERIES

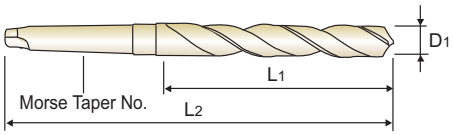
HSS, MORSE TAPER SHANK TWIST DRILLS

JOBBER
KURZ
COURTE
CORTA

HSS, SPIRALBOHRER mit MORSEKEGELSCHAFT
Forets HSS, queue cône morse, série courte
PUNTE ELICOIDALI IN HSS, ATTACCO CM

▶**Surface treatment** : Steam Tempered(Black Oxide Finish)
▶**Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cas tiron, malleable cast iron, graphite.

▶**Oberflächenbehandlung** : Steam Homo(Schwarzoxidation)
▶**Verwendung** : Zum Bohren von Stahl und Stahlguß, Grauguß, Temperguß, Sphäroguß, Sintereisen, Graphit.



DIN 345 | HSS | N ≈ 30° | 1 ~ 5 | h8 | 118° | Vap

p.A285

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1205235	23.5	155	276	3
D120523B	23.75	160	281	3
D1205240	24.0	160	281	3
D120524A	24.25	160	281	3
D1205245	24.5	160	281	3
D120524B	24.75	160	281	3
D1205250	25.0	160	281	3
D120525A	25.25	165	286	3
D1205255	25.5	165	286	3
D120525B	25.75	165	286	3
D1205260	26.0	165	286	3
D1205265	26.5	165	286	3
D120526B	26.75	170	291	3
D1205270	27.0	170	291	3
D120527A	27.25	170	291	3
D1205275	27.5	170	291	3
D1205280	28.0	170	291	3
D120528A	28.25	175	296	3
D1205285	28.5	175	296	3
D120528B	28.75	175	296	3
D1205290	29.0	175	296	3
D120529A	29.25	175	296	3
D1205295	29.5	175	296	3
D120529B	29.75	175	296	3
D1205300	30.0	175	296	3
D120530A	30.25	180	301	3

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1205305	30.5	180	301	3
D120530B	30.75	180	301	3
D1205310	31.0	180	301	3
D120531A	31.25	180	301	3
D1205315	31.5	180	301	3
D120531B	31.75	185	306	3
D1205320	32.0	185	334	4
D1205325	32.5	185	334	4
D1205330	33.0	185	334	4
D1205335	33.5	185	334	4
D1205340	34.0	190	339	4
D1205345	34.5	190	339	4
D1205350	35.0	190	339	4
D1205355	35.5	190	339	4
D1205360	36.0	195	344	4
D1205365	36.5	195	344	4
D1205370	37.0	195	344	4
D1205375	37.5	195	344	4
D1205380	38.0	200	349	4
D1205385	38.5	200	349	4
D1205390	39.0	200	349	4
D1205395	39.5	200	349	4
D1205400	40.0	200	349	4
D1205405	40.5	205	354	4
D1205410	41.0	205	354	4
D1205420	42.0	205	354	4

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○		○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

MORSE TAPER SHANK DRILLS

D1206 SERIES

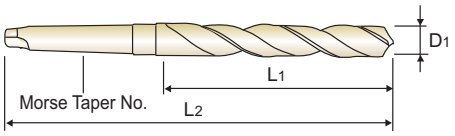
HSS, MORSE TAPER SHANK TWIST DRILLS

LONG
LANG
LONGUE
LUNGA

HSS, SPIRALBOHRER mit MORSEKEGELSCHAFT
Forets HSS, queue cône morse, série longue
PUNTE ELICOIDALI IN HSS, ATTACCO CM

▶**Surface treatment** : Steam Tempered(Black Oxide Finish)
▶**Application** : Drilling deep holes in steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron, graphite.

▶**Oberflächenbehandlung** : Steam Homo(Schwarzoxidation)
▶**Verwendung** : Für Bohrungen mit Bohrbuchsen oder an tief liegenden Stellen.
Zum Bohren von Stahl und Stahlguß, Grauß, Temperguß, Sphäroguß, Sintereisen, Neusilber und Graphit.



DIN 341 | HSS | N ≈ 30° | 1 ~ 3 | h8 | 118° | Vap p.A285

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1206130	13.0	134	215	1
D1206135	13.5	142	223	1
D1206140	14.0	142	223	1
D1206145	14.5	147	245	2
D1206150	15.0	147	245	2
D1206155	15.5	153	251	2
D1206160	16.0	153	251	2
D1206165	16.5	159	257	2
D1206170	17.0	159	257	2
D1206175	17.5	165	263	2
D1206180	18.0	165	263	2
D1206185	18.5	171	269	2
D1206190	19.0	171	269	2

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1206195	19.5	177	275	2
D1206200	20.0	177	275	2
D1206210	21.0	184	282	2
D1206220	22.0	191	289	2
D1206230	23.0	198	296	2
D1206250	25.0	206	327	3
D1206260	26.0	214	335	3
D1206280	28.0	222	343	3
D1206290	29.0	230	351	3
D1206300	30.0	230	351	3

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○		○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

MORSE TAPER SHANK DRILLS

D1210 SERIES

HSS, MORSE TAPER SHANK TWIST DRILLS

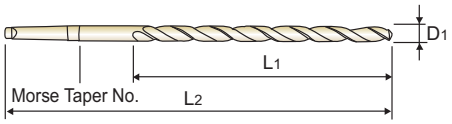
EXTRA LONG

HSS, SPIRALBOHRER mit MORSEKEGELSCHAFT
Forets HSS, queue cône morse, série extra-longue
PUNTE ELICOIDALI IN HSS, ATTACCO CM

ÜBERLANG
EXTRA-LONGUE
EXTRA LUNGA

▶**Surface treatment** : Steam Tempered(Black Oxide Finish)
▶**Application** : Designed for drilling deep holes or deeply located holes. Drilling into steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron, Spheriodal graphite cast iron, sintered iron, aluminum and aluminum alloys.

▶**Oberflächenbehandlung** : Steam Homo(Schwarzoxidation)
▶**Verwendung** : Standardbohrer zum Bohren extrem tiefer Löcher.
Zum Bohren von Stahl und Stahlguß, Grauguß, Temperguß, Sphäroguß, Sintereisen und Graphit



DIN 1870/2 | HSS | N ≈ 30° | 1 ~ 4 | h8 | 118° | Vap p.A285

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1210130	13.0	260	395	1
D1210135	13.5	275	410	1
D1210140	14.0	275	410	1
D1210150	15.0	275	425	2
D1210155	15.5	295	445	2
D1210160	16.0	295	445	2
D1210165	16.5	295	445	2
D1210170	17.0	295	445	2
D1210175	17.5	310	465	2
D1210180	18.0	310	465	2
D1210190	19.0	310	465	2
D1210195	19.5	325	490	2
D1210200	20.0	325	490	2
D1210205	20.5	325	490	2
D1210215	21.5	345	515	2
D1210230	23.0	345	515	2
D1210235	23.5	345	535	3
D1210240	24.0	365	555	3
D1210245	24.5	365	555	3
D1210250	25.0	365	555	3
D1210255	25.5	365	555	3
D1210260	26.0	365	555	3

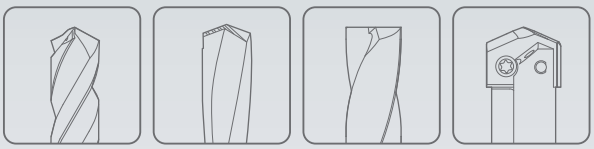
EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2	Morse Taper No.
D1210270	27.0	385	580	3
D1210275	27.5	385	580	3
D1210280	28.0	385	580	3
D1210285	28.5	385	580	3
D1210300	30.0	385	580	3
D1210310	31.0	410	610	3
D1210320	32.0	410	635	4
D1210340	34.0	430	665	4
D1210350	35.0	430	665	4
D1210360	36.0	430	665	4
D1210370	37.0	430	665	4
D1210390	39.0	460	695	4
D1210400	40.0	460	695	4
D1210410	41.0	460	695	4
D1210430	43.0	490	735	4
D1210470	47.0	490	735	4
D1210480	48.0	510	765	4
D1210490	49.0	510	765	4

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○		◎	○	○		○		◎	○		○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○						○							○					

Global Cutting Tool Leader **YG-1**



HOLEMAKING

SOLID CARBIDE & HSS Co8
NC-SPOTTING DRILLS

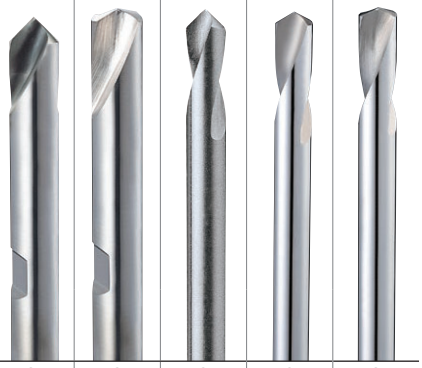
For Centering and Chamfering of Holes

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A294

	SERIES	D5306 D5307	D5320	D2306 D2321	D2307 D2322	D2320 D2323
	POINT ANGLE	90°/120°	142°	90°	120°	142°
	SIZE MIN	D6.0	D3.0	D3.0	D3.0/D6.0	D3.0/D6.0
	SIZE MAX	D20.0	D20.0	D20.0	D20.0/D12.0	D20.0/D12.0
	PAGE	A289	A290	A291	A292	A283
	SURFACE TREATMENT	Bright				



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc					
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28					
	5		About 0.75% C	Quenched & Tempered	300	32					
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	○	○	○	○	○
	8			Quenched & Tempered	300	32					
	9			Quenched & Tempered	350	38					
	10	High alloyed steel, and tool steel		Annealed	200	15					
	11			Quenched & Tempered	325	35					
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○	○	○
	13		Martensitic	Quenched & Tempered	240	23					
	14		Austenitic		180	10					
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○	○	○
	18		Pearlitic		250	25					
	19	Malleable cast iron	Ferritic		130		○	○	○	○	○
	20		Pearlitic		230	21					
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○	○	○
	22		Curable	Hardened	100		○	○	○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○	○	○
	24		≤ 12% Si, Curable	Hardened	90						
	25		> 12% Si, Not Curable		130						
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						
	27		CuZn, CuSnZn (Brass)		90						
	28		CuSn, lead-free copper and electrolytic copper		100						
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○			
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55					
	39			Hardened	630	60					
	40	Chilled Cast Iron		Cast	400	42					
	41	Hardened Cast Iron		Hardened	550	55					

NC-SPOTTING DRILLS

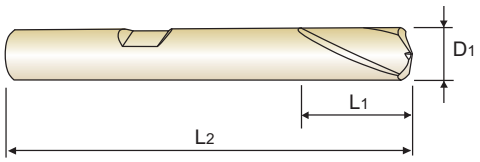
D5320 SERIES

CARBIDE, NC-SPOTTING DRILLS 142°

VOLLHARTMETALL NC-ANBOHRER 142°
Forets carbure à pointer NC 142°
PUNTE IN MD A CENTRARE NC 142°

▶**Application** : For more precise centering work on NC/CNC machines. The large diameter of the tool permits chamfering work after centering continuously.

▶**Verwendung** : Auf NC-Maschinen, Lehrenbohrwerken u.a. kapitalintensiven Bohrwerken, zum Zentrieren und Anfasen von Gewindebohrungen in einem Arbeitsgang. Besonders geeignet zum Anbohren von hochfesten Stählen, Stahlguß, Grauguß, Hartguß, Mangan-Hartstahl, CrNi-Stählen, Bronze, Leicht-und Buntmetallen.



CARBIDE | DIN 6535HB | h6 | 142° | Bright

p.A294

NC-Spotting drills 142°
NC-Anbohrer 142°

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
● D5320030	3.0	8	32
● D5320040	4.0	10	40
● D5320050	5.0	13	50
D5320060	6.0	13	50
D5320080	8.0	23	60
D5320100	10.0	24	70
D5320120	12.0	24	70
D5320200	20.0	35	100

● with plain shank

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎	○					○			◎	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○													○					

NC-SPOTTING DRILLS

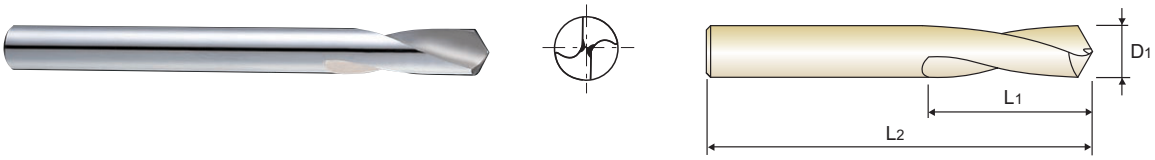
D2307 SERIES
D2322 SERIES

HSS Co8, NC-SPOTTING DRILLS 120°

- HSS Co8, NC-ANBOHRER 120°
- Forets HSS Co8 à pointer NC 120°
- PUNTE A CENTRARE NC 120°, HSS Co8

▶**Application** : For more precise centering work on NC/CNC Machines.
The large diameter of the tool permits chamfering work after centering continuously.

▶**Verwendung** : Für positionsgenaues und schnelles Anbohren mit NC/CNC-Maschinen und Bearbeitungszentren, die Ausführung mit Spitzenwinkel 90° ermöglicht sowohl ein Zentrieren, als auch das Vorbohren für einen nächstgrößeren Durchmesser.



NC | HSS Co8 | h6 | h6 | 120° | Bright

p.A294

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2307030	3.0	12	46
D2307040	4.0	12	55
D2307050	5.0	15	60
D2307060	6.0	20	66
D2307080	8.0	25	79
D2307100	10.0	25	89
D2307120	12.0	30	102
D2307160	16.0	35	115
D2307200	20.0	40	131

▶ TiN, TiCN and TiAlN are available on your request.

LONG LENGTH

Unit : mm

EDP No.	Drill Diameter D1	Flute Length L1	Overall Length L2
D2322060	6.0	20	140
D2322080	8.0	25	140
D2322100	10.0	25	170
D2322120	12.0	30	170

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎	○					○			◎	○	○		○	

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○																		

NC-SPOTTING DRILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

D5306, D5307, D5320 SERIES — CARBIDE, NC-SPOTTING DRILLS

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)								
					2.0	3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1	Non-alloy steel	75	RPM	11940	7960	5970	3980	2980	2390	1990	1490	1190
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	2		70	RPM	11140	7430	5570	3710	2790	2230	1860	1390	1110
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	3		65	RPM	10350	6900	5170	3450	2590	2070	1720	1290	1030
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
	6	Low alloy steel	70	RPM	11140	7430	5570	3710	2790	2230	1860	1390	1110
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	7		55	RPM	8750	5840	4380	2920	2190	1750	1460	1090	880
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
M	12	Stainless steel	35	RPM	5570	3710	2790	1860	1390	1110	930	700	560
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
K	15	Grey cast iron	90	RPM	14320	9550	7160	4770	3580	2860	2390	1790	1430
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.20	0.18-0.24	0.22-0.28
	16		70	RPM	11140	7430	5570	3710	2790	2230	1860	1390	1110
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
	17	Nodular cast iron	90	RPM	14320	9550	7160	4770	3580	2860	2390	1790	1430
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.20	0.18-0.24	0.22-0.28
	19	Malleable cast iron	60	RPM	9550	6370	4770	3180	2390	1910	1590	1190	950
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.2	0.18-0.24	0.22-0.28
N	21	Aluminum-wrought alloy	165	RPM	26260	17510	13130	8750	6570	5250	4380	3280	2630
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31
	22		130	RPM	20690	13790	10350	6900	5170	4140	3450	2590	2070
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31
	23	Aluminum-cast, alloyed	110	RPM	17510	11670	8750	5840	4380	3500	2920	2190	1750
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31
S	36	Titanium Alloys	35	RPM	5570	3710	2790	1860	1390	1110	930	700	560
				FEED	0.01-0.03	0.03-0.05	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19

D2320, D2321, D2322, D2323, D2306, D2307 SERIES — HSS Co8, NC-SPOTTING DRILLS

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Parameter	Drill Diameter (mm)								
					2.0	3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1	Non-alloy steel	25	RPM	3980	2650	1990	1330	990	800	660	500	400
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	2		25	RPM	3980	2650	1990	1330	990	800	660	500	400
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	3		15	RPM	2390	1590	1190	800	600	480	400	300	240
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
	6	Low alloy steel	20	RPM	3180	2120	1590	1060	800	640	530	400	320
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
	7		15	RPM	2390	1590	1190	800	600	480	400	300	240
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
M	12	Stainless steel	15	RPM	2390	1590	1190	800	600	480	400	300	240
				FEED	0.02-0.04	0.04-0.06	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19	0.15-0.21
K	15	Grey cast iron	30	RPM	4770	3180	2390	1590	1190	950	800	600	480
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.20	0.18-0.24	0.22-0.28
	16		25	RPM	3980	2650	1990	1330	990	800	660	500	400
				FEED	0.01-0.03	0.03-0.05	0.04-0.07	0.05-0.08	0.07-0.10	0.08-0.12	0.09-0.14	0.11-0.17	0.13-0.19
	17	Nodular cast iron	30	RPM	4770	3180	2390	1590	1190	950	800	600	480
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.20	0.18-0.24	0.22-0.28
	19	Malleable cast iron	20	RPM	3180	2120	1590	1060	800	640	530	400	320
				FEED	0.03-0.05	0.05-0.07	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.16	0.15-0.20	0.18-0.24	0.22-0.28
N	21	Aluminum-wrought alloy	65	RPM	10350	6900	5170	3450	2590	2070	1720	1290	1030
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31
	22		60	RPM	9550	6370	4770	3180	2390	1910	1590	1190	950
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31
	23	Aluminum-cast, alloyed	50	RPM	7960	5310	3980	2650	1990	1590	1330	990	800
				FEED	0.04-0.06	0.06-0.09	0.08-0.11	0.10-0.13	0.12-0.15	0.15-0.19	0.18-0.23	0.21-0.27	0.25-0.31

Leading Through Innovation

SOLID CARBIDE, HSS & HSS-E

CENTER DRILLS

ZENTRIERBOHRER

- For General Purpose
- Für allgemeine Anwendungen

SERIES	D5303	DV303	DV333
TOOL MATERIAL	CARBIDE	HSS-E	HSS-E
TYPE	FORM A	FORM A	FORM A
SIZE MIN	D1.0	D0.5	D1.6
SIZE MAX	D6.3	D6.3	D6.3
PAGE	A298	A299	
SURFACE TREATMENT	Bright		

SOLID CARBIDE, HSS & HSS-E
CENTER DRILLS

For General Purpose

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A305

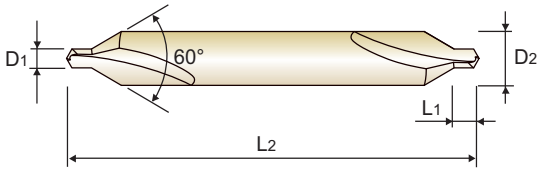
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	D5303	DV303	DV333
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	○	○
	4		About 0.75% C	Annealed	270	28			
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	○	○	○
	8			Quenched & Tempered	300	32			
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15			
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○
	18		Pearlitic		250	25			
	19	Malleable cast iron	Ferritic		130		○	○	○
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

CENTER DRILLS

D5303 SERIES

CARBIDE, CENTER DRILLS / FORM A

- VOLLHARTMETALL, ZENTRIERBOHRER / FORM A
- Forets carbure à centrer / Forme A
- PUNTE A CENTRARE IN MD / FORMA A



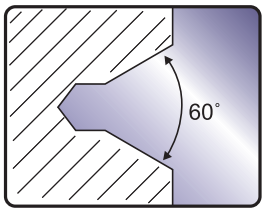
DIN 333 | CARBIDE | h8 | k12 | 120° | Bright

p.A305

FORM A (60°)

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Pilot Length L1	Overall Length L2
D5303010	1.0	3.15	1.3	31.5
D5303912	1.25	3.15	1.6	31.5
D5303016	1.6	4	2	35.5
D5303020	2.0	5	2.5	40
D5303025	2.5	6.3	3.1	45
D5303931	3.15	8	3.9	50
D5303040	4.0	10	5	56
D5303050	5.0	12.5	6.3	63
D5303063	6.3	16	8	71



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎	○					○			◎	○	○		○	

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

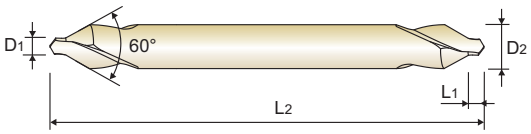
CENTER DRILLS

DV334 SERIES

HSS-E, CENTER DRILLS EXTRA LONG / FORM A

- HSS-EX, ZENTRIERBOHRER / FORM A
- Forets HSS-EX à centrer / Forme A, série extra-longue
- PUNTE A CENTRARE PER TORNI IN HSS-EX / FORMA A

Form A(DV334)



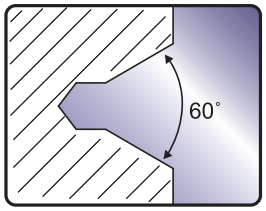
HSS-E | h8 | k12 | 120° | Bright

p.A305

EXTRA LONG / FORM A (60°)

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Pilot Length L1	Overall Length L2
DV334010	1.0	4	1.3	120
DV334016	1.6	5	2	120
DV334020	2.0	6	2.5	120
DV334025	2.5	8	3.1	120
DV334931	3.15	10	3.9	120
DV334040	4.0	12	5	120
DV334050	5.0	14	6.3	120



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○					○			◎	○	○		○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

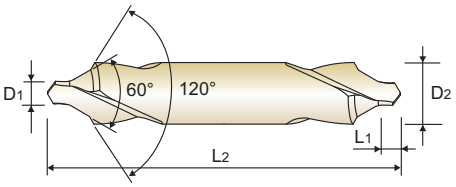
CENTER DRILLS

D1313 SERIES
D1353 SERIES

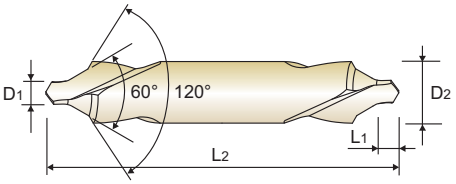
HSS, CENTER DRILLS / FORM B

- HSS, ZENTRIERBOHRER / FORM B
- Forets HSS à centrer / Forme B
- PUNTE A CENTRARE PER TORNI IN HSS / FORMA B

Form B(D1313)



Form B(D1353)



DIN 333 | HSS | h8 | k12 | 120° | Bright

p.A305

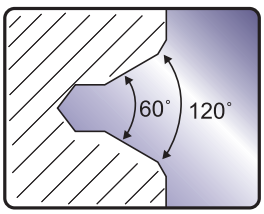
FORM B (60° + 120°)

EDP No.	Drill Diameter D1	Shank Diameter D2	Pilot Length L1	Overall Length L2
D1313010	1.0	4	1.3	35.5
D1313912	1.25	5	1.6	40
D1313016	1.6	6.3	2	45
D1313020	2.0	8	2.5	50
D1313025	2.5	10	3.1	55
D1313931	3.15	11.2	3.9	60
D1313040	4.0	14	5	67
D1313050	5.0	18	6.3	75
D1313063	6.3	20	8	80

LEFT HELIX / FORM B (60° + 120°)

Unit : mm

EDP No.	Drill Diameter D1	Shank Diameter D2	Pilot Length L1	Overall Length L2
D1353020	2.0	8	2.5	50
D1353025	2.5	10	3.1	55
D1353931	3.15	11.2	3.9	60
D1353040	4.0	14	5	67
D1353063	6.3	20	8	80



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○					○			◎	○	○		○	

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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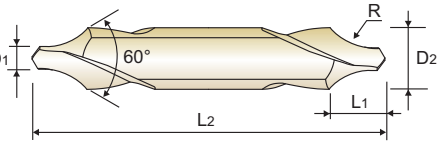
CENTER DRILLS

DV383 SERIES

HSS-E, CENTER DRILLS / FORM R

- HSS-EX, ZENTRIERBOHRER / FORM R
- Forets HSS-EX à centrer / Forme R
- PUNTE A CENTRARE PER TORNI IN HSS-EX / FORMA R

Form R (DV383)



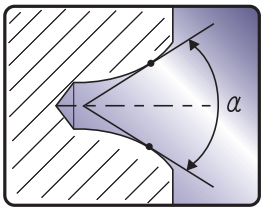
DIN 333 | HSS-E | h8 | k12 | 120° | Bright

p.A305

FORM R / FLAT

Unit : mm

EDP No.	Drill Diameter	Shank Diameter	Pilot Length (Include Radius)	Overall Length	Radius
	D1	D2	L1	L2	R
DV383016	1.6	4	4.25	35.5	4
DV383020	2.0	5	5.3	40	5
DV383025	2.5	6.3	6.7	45	6.3
DV383931	3.15	8	8.5	50	8
DV383040	4.0	10	10.6	56	10
DV383050	5.0	12.5	13.2	63	12.5
DV383063	6.3	16	17	71	16



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○			◎	○					○			◎	○	○		○	

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

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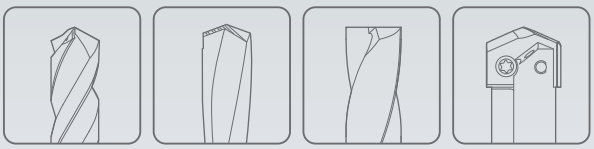
Global Cutting Tool Leader **YG-1**



HOLEMAKING

Leading Through Innovation

INSERTS & HOLDERS

SPADE DRILLS

BOHRMESSER

- **For General Machines and Drilling Large Diameters, Longer Tool Life and High Productivity**

- **Für allgemeine Maschinen und zum Bohren großer Durchmesser, längere Werkzeugstandzeiten und höhere Produktivität**

SELECTION GUIDE

YG HOLEMAKING TOOLS

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INSERTS & HOLDERS
SPADE DRILLS

For General Machines and Drilling Large Diameters
Longer Tool Life and High Productivity

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A357

SERIES	1~8	Y,Z,0,1~4	Y,Z,0,1,2
TOOL MATERIAL	HSS M4	SUPER HSS T15	PREMIUM HSS M48
POINT	STANDARD	STANDARD	STANDARD
SIZE MIN	Ø18(#1)	Ø9.5(#Y)	Ø9.5(#Y)
SIZE MAX	Ø114.3(#8)	Ø65.09(#4)	Ø35(#2)
PAGE	A310	A315	A320
SURFACE TREATMENT	TiN / TiCN / TiAlN		

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	◎	◎
	2		About 0.45% C	Annealed	190	13	○	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	○	◎	◎
	4		About 0.75% C	Annealed	270	28	○	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10	○	◎	◎
	7			Quenched & Tempered	275	29	○	◎	◎
	8			Quenched & Tempered	300	32		○	◎
	9			Quenched & Tempered	350	38		○	◎
	10	High alloyed steel, and tool steel		Annealed	200	15		○	◎
	11			Quenched & Tempered	325	35		○	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		○	○
	13		Martensitic	Quenched & Tempered	240	23		○	○
	14		Austenitic		180	10		○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	○	○
	16		Pearlitic (Martensitic)		260	26	○	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	○	○
	18		Pearlitic		250	25	○	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	○	○
	20		Pearlitic		230	21	○	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60		◎	○	○
	22		Curable	Hardened	100		◎	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90		◎	○	○
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		◎	◎
	32			Cured	280	30		○	◎
	33		Ni or Co Based	Annealed	250	25		○	◎
	34			Cured	350	38		○	◎
	35			Cast	320	34		○	◎
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55		○	◎
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

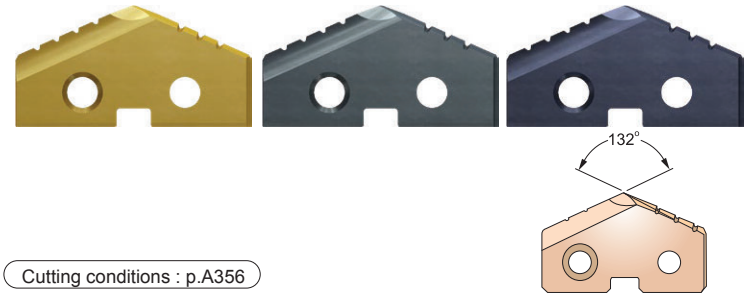
TAPER SHANK		TAPER SHANK HOLDERS - INCH/METRIC	A340
FLANGED SHANK		FLANGED STRAIGHT SHANK HOLDERS - INCH/METRIC	A344

SPADE DRILLS

SERIES 1, 2

SPADE DRILL INSERTS - HSS M4

EINWEG BOHREINSATZ - HSS M4
Plaquettes SPADE DRILL - HSS M4
CUSPIDI SPADE DRILL - HSS M4



- For general use in steels and cast irons.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Für allgemeine Anwendung in Stahl und Gusseisen
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A356

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No. HSS M4		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	TiN	TiCN	TiAlN
1 Ø17.53 (.690) to Ø24.38 (.960)		18.00	.7087	4.0 (5/32)			S1465180
		18.50	.7283				S1465185
		19.00	.7480				S1465190
		19.50	.7677				S1465195
		20.00	.7874		S1455200		S1465200
		20.50	.8071				S1465205
		21.00	.8268				S1465210
	27/32	21.43	.8438		S1405054		S1415054
		23.00	.9055				S1465230
		24.00	.9449				S1465240
2 Ø24.41 (.961) to Ø35.05 (1.380)	63/64	25.00	.9843	4.8 (3/16)			S1465250
	1	25.40	1.0000				S1415100
	1-1/64	25.80	1.0156				S1415101
		26.00	1.0236				S1465260
	1-1/32	26.19	1.0313		S1405102		
		27.00	1.0630				S1465270
	1-3/32	27.78	1.0938		S1405106		
		28.00	1.1024		S1455280		S1465280
	1-5/32	29.37	1.1563		S1405110		
		30.00	1.1811		S1455300		S1465300
		31.00	1.2205				S1465310
		32.00	1.2598		S1455320		S1465320
	1-9/32	32.54	1.2813		S1405118		
		33.00	1.2992		S1455330		
	1-5/16	33.34	1.3125		S1405120		
		34.00	1.3386		S1455340		S1465340
	1-3/8	34.93	1.3750				S1415124
		35.00	1.3780		S1455350		S1465350

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○								◎	○	◎	○	◎	○

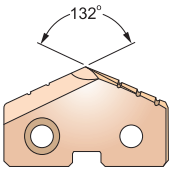
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎					◎														

SPADE DRILLS

SERIES 4 ,5

SPADE DRILL INSERTS - HSS M4

EINWEG BOHREINSATZ - HSS M4
Plaquettes FORETS A LAME - HSS M4
CUSPIDI SPADE DRILL - HSS M4



- For general use in steels and cast irons.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Für allgemeine Anwendung in Stahl und Gusseisen
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A356

Series Min. to Max. mm (inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm, inch)	EDP No. HSS M4 TiN	EDP No. HSS M4 TiCN	EDP No. HSS M4 TiAlN
4 Ø46.99 (1.850) to Ø65.28 (2.570)	2-5/16	58.74	2.3125	7.9 (5/16)	S1405220		
		59.00	2.3228		S1455590		
		60.00	2.3622		S1455600		S1465600
		61.00	2.4016		S1455610		
		62.00	2.4409		S1455620		S1465620
		63.00	2.4803		S1455630		
	2-1/2	63.50	2.5000				S1415232
		64.00	2.5197		S1455640		S1465640
	2-17/32	64.29	2.5313				
		65.00	2.5591		S1455650		S1465650
5 Ø62.38 (2.456) to Ø76.20 (3.000)	2-1/2	63.50	2.5000	11.1 (7/16)			S14152D2
		64.00	2.5197		S145564A		S146564A
	2-9/16	65.09	2.5625				S14152D6
	2-19/32	65.88	2.5938				S1415238
		66.00	2.5984		S1455660		S1465660
	2-5/8	66.68	2.6250				S1415240
	2-21/32	67.47	2.6563				S1415242
		68.00	2.6772		S1455680		S1465680
	2-11/16	68.26	2.6875		S1405244		
	2-23/32	69.05	2.7188				S1415246
	2-3/4	69.85	2.7500				S1415248
		70.00	2.7559		S1455700		S1465700
	2-25/32	70.64	2.7813				S1415250

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○								◎	○	◎	○	◎	○

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎					◎														

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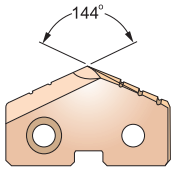
SPADE DRILLS

SERIES 7, 8

SPADE DRILL INSERTS - HSS M4

EINWEG BOHREINSATZ - HSS M4
Plaquettes FORETS A LAME - HSS M4
CUSPIDI SPADE DRILL - HSS M4



- For general use in steels and cast irons.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Für allgemeine Anwendung in Stahl und Gusseisen
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A356

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No. HSS M4		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	TiN	TiCN	TiAlN
7 Ø87.76 (3.455) to Ø101.60 (4.000)		90.00	3.5433	11.1 (7/16)	S1455900		S1465900
	3-19/32	91.28	3.5938		S1405338		
		92.00	3.6221		S1455920		S1465920
	3-5/8	92.08	3.6250				S1415340
	3-21/32	92.87	3.6563				S1415342
	3-11/16	93.66	3.6875				S1415344
		94.00	3.7008				S1465940
	3-23/32	94.46	3.7188		S1405346		
		96.00	3.7795				S1465960
		98.00	3.8583		S1455980		S1465980
		100.00	3.9370		S1455A00		S1465A00
	4	101.60	4.0000				S1415400
8 Ø101.63 (4.001) to Ø114.48 (4.507)	4-3/32	104.00	4.0945	11.1 (7/16)	S1455A40		
	4-1/8	104.78	4.1250				S1415408
	4-5/16	109.54	4.3125		S1405420		
		110.00	4.3307		S1455B00		S1465B00
	4-3/8	111.13	4.3750		S1405424		
		112.00	4.4094		S1455B20		S1465B20
		114.00	4.4882		S1455B40		S1465B40
	4-1/2	114.30	4.5000				S1415432

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○								◎	○	◎	○	◎	○

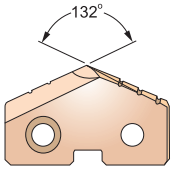
ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎					◎														

SPADE DRILLS

SERIES 0, 1

SPADE DRILL INSERTS - SUPER HSS T15

EINWEG BOHREINSATZ - SUPER HSS T15
Plaquettes SPADE DRILL - Super HSS T15
CUSPIDI SPADE DRILL - SUPER HSS T15



- For use in high nickel alloys and materials over 280 Brinell.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Zur Anwendung bei legierten Stählen mit hohem Nickelanteil und Werkstoffen über 280 Brinell
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A360

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No. SUPER HSS T15		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	TiN	TiCN	TiAlN
0 Ø12.98 (.511) to Ø17.65 (.695)	41/64	16.27	.6406	3.2 (1/8)			S1115041
		16.50	.6496		S1155165	S1160165	S1165165
	21/32	16.67	.6563				S1115042
		17.00	.6693		S1155170	S1160170	S1165170
	43/64	17.07	.6719				S1115043
		17.50	.6890			S1160175	S1165175
1 Ø17.53 (.690) to Ø24.38 (.960)	45/64	17.86	.7031	4.0 (5/32)			S1115045
		18.00	.7087		S1155180	S1160180	S1165180
	23/32	18.26	.7188				S1115046
		18.50	.7283		S1155185	S1160185	S1165185
	47/64	18.65	.7344				S1115047
		19.00	.7480		S1155190	S1160190	S1165190
	3/4	19.05	.7500				S1115048
	49/64	19.45	.7656				S1115049
		19.50	.7677		S1155195		S1165195
	25/32	19.84	.7813				S1115050
		20.00	.7874		S1155200	S1160200	S1165200
	51/64	20.24	.7969				S1115051
		20.50	.8071		S1155205	S1160205	S1165205
		21.00	.8268		S1155210		S1165210
	27/32	21.43	.8438		S1105054		S1115054
		22.00	.8661		S1155220	S1160220	S1165220
	7/8	22.23	.8750			S1110056	S1115056
	57/64	22.62	.8906				S1115057
		23.00	.9055		S1155230		S1165230
	29/32	23.02	.9063				S1115058
	59/64	23.42	.9219				S1115059
	15/16	23.81	.9375				S1115060
		24.00	.9449		S1155240		S1165240

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	○	○	○	○	○	○	○	○	◎	○	◎	○	◎

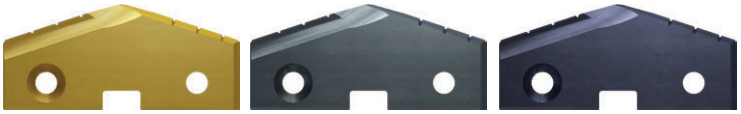
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				◎	○	○	○	○			○			

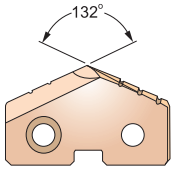
SPADE DRILLS

SERIES 3, 4

SPADE DRILL INSERTS - SUPER HSS T15

EINWEG BOHREINSATZ - SUPER HSS T15
Plaquettes SPADE DRILL - Super HSS T15
CUSPIDI SPADE DRILL - SUPER HSS T15





- For use in high nickel alloys and materials over 280 Brinell.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Zur Anwendung bei legierten Stählen mit hohem Nickelanteil und Werkstoffen über 280 Brinell
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A360

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No. SUPER HSS T15		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	TiN	TiCN	TiAlN
3 Ø34.37 (1.353) to Ø47.80 (1.882)	1-1/2	38.10	1.5000	6.4 (1/4)	S1105132		S1115132
	1-17/32	38.89	1.5313				S1115134
		39.00	1.5354		S1155390		S1165390
	1-9/16	39.69	1.5625				S1115136
		40.00	1.5748		S1155400		S1165400
	1-19/32	40.48	1.5938				S1115138
		41.00	1.6142		S1155410		S1165410
	1-5/8	41.28	1.6250				S1115140
		42.00	1.6535		S1155420		S1165420
	1-11/16	42.86	1.6875				S1115144
		43.00	1.6929		S1155430		S1165430
	1-23/32	43.66	1.7188				S1115146
		44.00	1.7323		S1155440		S1165440
	1-3/4	44.45	1.7500				S1115148
		45.00	1.7717		S1155450	S1160450	S1165450
	1-25/32	45.24	1.7813				S1115150
		46.00	1.8110		S1155460		
	1-13/16	46.04	1.8125				S1115152
	1-27/32	46.83	1.8438				S1115154
		47.00	1.8504		S1155470		S1165470
4 Ø46.99 (1.850) to Ø65.28 (2.570)		48.00	1.8898	7.9 (5/16)	S1155480		S1165480
		49.00	1.9291		S1155490		S1165490
	1-15/16	49.21	1.9375				S1115160
		50.00	1.9685		S1155500		S1165500
	1-31/32	50.01	1.9688				S1115162
	2	50.80	2.0000				S1115200
		51.00	2.0079		S1155510		S1165510
	2-1/32	51.59	2.0313				S1115202
	2-3/64	52.00	2.0472		S1155520		S1165520
	2-1/16	52.39	2.0625				S1115204
		53.00	2.0866		S1155530		S1165530

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	○	○	○	○	○	○	○	○	◎	○	◎	○	◎

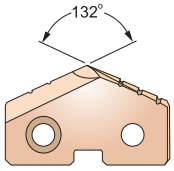
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				◎	○	○	○	○			○			

SPADE DRILLS

SERIES Y, Z, 0

SPADE DRILL INSERTS - PREMIUM HSS M48

EINWEG BOHREINSATZ - PREMIUM HSS M48
Plaquettes SPADE DRILL - HSS Premium M48
CUSPIDI SPADE DRILL - PREMIUM HSS M48



- For use in high temperature alloys and materials with 350~500 Brinell.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Zur Anwendung bei hitzebeständigen Legierungen und Werkstoffen mit 350~500 Brinell
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A358

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No. PREMIUM HSS M48		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	TiN	TiCN	TiAlN
Y Ø9.50 (.374) to Ø11.07 (.436)		9.50	.3740	2.4 (3/32)	S1555095		S1565095
		9.80	.3860		S1555098		S1565098
		10.00	.3937		S1555100	S1560100	S1565100
		10.20	.4016		S1555102		S1565102
	13/32	10.32	.4063				S1515026
		10.50	.4134		S1555105		S1565105
	27/64	10.72	.4219				S1515027
		10.80	.4252				S1565108
		11.00	.4331		S1555110	S1560110	S1565110
Z Ø11.11(.437) to Ø12.95(.510)		11.50	.4528	2.4 (3/32)	S1555115		S1565115
	29/64	11.51	.4531				S1515029
		12.00	.4724				S1565120
		12.50	.4921				S1565125
0 Ø12.98 (.511) to Ø17.65 (.695)		13.00	.5118	3.2 (1/8)	S1555130		S1565130
	33/64	13.10	.5156				S1515033
		13.50	.5315		S1555135	S1560135	S1565135
		14.00	.5512			S1560140	S1565140
	9/16	14.29	.5625				S1515036
		14.50	.5709		S1555145	S1560145	
	37/64	14.68	.5781				S1515037
		15.00	.5906				S1565150
		15.50	.6102				S1565155
	5/8	15.88	.6250				S1515040
		16.00	.6299			S1560160	S1565160

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	○	○	○	○	◎	○	◎	○	◎

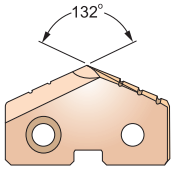
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				◎	◎	◎	◎	◎			◎			

SPADE DRILLS

SERIES 2

SPADE DRILL INSERTS - PREMIUM HSS M48

EINWEG BOHREINSATZ - PREMIUM HSS M48
Plaquettes SPADE DRILL - HSS Premium M48
CUSPIDI SPADE DRILL - PREMIUM HSS M48



- For use in high temperature alloys and materials with 350~500 Brinell.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Zur Anwendung bei hitzebeständigen Legierungen und Werkstoffen mit 350~500 Brinell
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A358

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No. PREMIUM HSS M48		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	TiN	TiCN	TiAlN
2 Ø24.41 (.961) to Ø35.05 (1.380)	31/32	24.61	.9688	4.8 (3/16)	S1505062		S1515062
	63/64	25.00	.9843				S1565250
	1	25.40	1.0000				S1515100
		26.00	1.0236		S1555260	S1560260	S1565260
	1-1/32	26.19	1.0313				S1515102
	1-3/64	26.59	1.0469				S1515103
		27.00	1.0630			S1560270	S1565270
	1-3/32	27.78	1.0938				S1515106
		28.00	1.1024				S1565280
	1-1/8	28.58	1.1250				S1515108
		29.00	1.1417		S1555290		S1565290
	1-5/32	29.37	1.1563				S1515110
		30.00	1.1811		S1555300		S1565300
	1-3/16	30.16	1.1875				S1515112
		31.00	1.2205				S1565310
	1-1/4	31.75	1.2500				S1515116
		32.00	1.2598		S1555320		S1565320
	1-9/32	32.54	1.2813				S1515118
		33.00	1.2992		S1555330		S1565330
	1-5/16	33.34	1.3125				S1515120
		34.00	1.3386				S1565340
	1-3/8	34.93	1.3750				S1515124
		35.00	1.3780		S1555350		S1565350

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	○	○	○	○	◎	○	◎	○	◎

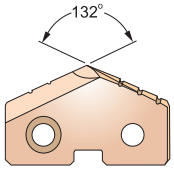
ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				◎	◎	◎	◎	◎			◎			

SPADE DRILLS

SERIES 1, 2

SPADE DRILL INSERTS for CAST IRON - CARBIDE K10

EINWEG BOHREINSATZ - VOLLHARTMETALL K10
Plaquettes SPADE DRILL pour la fonte - Carbure K10
CUSPIDI SPADE DRILL - MD K10



- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Beste Leistung in Grauguss über 220 Brinell, kurzspanendem Kugelgraphitguss, Si-Aluminium und Kupferlegierungen
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A359

Series Min. to Max. mm (inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm, inch)	EDP No. CARBIDE K10 TiN	EDP No. CARBIDE K10 TiCN	EDP No. CARBIDE K10 TiAlN
1 Ø17.53 (.690) to Ø24.38 (.960)		18.00	.7087	4.0 (5/32)	S1655180		
		19.00	.7480				S1665190
		20.00	.7874		S1655200		S1665200
		20.50	.8071		S1655205		
		23.00	.9055		S1655230		
		24.00	.9449		S1655240		S1665240
2 Ø24.41 (.961) to Ø35.05 (1.380)		26.00	1.0236	4.8 (3/16)	S1655260		S1665260
		29.00	1.1417				S1665290
		30.00	1.1811		S1655300		S1665300
		32.00	1.2598		S1655320		S1665320
		33.00	1.2992		S1655330		
		34.00	1.3386				S1665340

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended															◎	◎	◎	◎	◎	◎

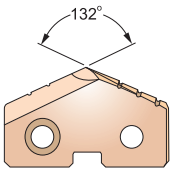
ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

SPADE DRILLS

SERIES 1, 2

SPADE DRILL INSERTS - CARBIDE K20

EINWEG BOHREINSATZ - VOLLHARTMETALL K20
Plaquettes SPADE DRILL - Carbure K20
CUSPIDI SPADE DRILL - MD K20



- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Beste Leistung in Grauguss über 220 Brinell, kurzspanendem Kugelgraphitguss, Si-Aluminium und Kupferlegierungen
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A359

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No. CARBIDE K20	
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	TiN	TiAlN
1 Ø17.53 (.690) to Ø24.38 (.960)		18.00	.7087	4.0 (5/32)		S1765180
		18.50	.7283			S1765185
		19.00	.7480			S1765190
	3/4	19.05	.7500			S1715048
		19.50	.7677			S1765195
		20.00	.7874			S1765200
		20.50	.8071		S1755205	S1765205
	13/16	20.64	.8125			S1715052
		21.00	.8268			S1765210
		22.00	.8661			S1765220
	7/8	22.23	.8750			S1715056
		23.00	.9055			S1765230
	29/32	23.02	.9063			S1715058
	59/64	23.42	.9219			S1715059
		24.00	.9449		S1755240	S1765240
2 Ø24.41 (.961) to Ø35.05 (1.380)	31/32	24.61	.9688	4.8 (3/16)		S1715062
	63/64	25.00	.9843		S1755250	S1765250
	1	25.40	1.0000		S1705100	S1715100
	1-1/64	25.80	1.0156			S1715101
		26.00	1.0236			S1765260
	1-3/64	26.59	1.0469			S1715103
		27.00	1.0630			S1765270
		28.00	1.1024			S1765280
	1-1/8	28.58	1.1250			S1715108
		29.00	1.1417			S1765290
	1-5/32	29.37	1.1563			S1715110
		30.00	1.1811		S1755300	S1765300
		31.00	1.2205		S1755310	S1765310
	1-1/4	31.75	1.2500			S1715116
		32.00	1.2598		S1755320	S1765320
		33.00	1.2992		S1755330	S1765330
		34.00	1.3386			S1765340
		35.00	1.3780			S1765350

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

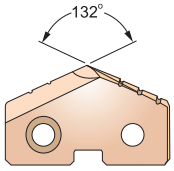
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎					◎				◎	◎	◎	◎	◎			○			

SPADE DRILLS

SERIES Y, Z, 0

SPADE DRILL INSERTS - CARBIDE P40

EINWEG BOHREINSATZ - VOLLHARTMETALL P40
Plaquettes SPADE DRILL - Carbure P40
CUSPIDI SPADE DRILL - MD P40



- For general use in carbon steels and alloy steels.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Für allgemeine Anwendung in Kohlenstoffstählen und legierten Stählen
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A361

Series Min. to Max. mm (inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm, inch)	EDP No. CARBIDE P40 TiN	EDP No. CARBIDE P40 TiCN	EDP No. CARBIDE P40 TiAlN
Y Ø9.50 (.374) to Ø11.07 (.436)		9.50	.3740	2.4 (3/32)			S1865095
	3/8	9.53	.3750				S1815024
		9.80	.3860		S1855098		
	25/64	9.92	.3906		S1805025		
		10.00	.3937				S1865100
		10.50	.4134				S1865105
	27/64	10.72	.4219				S1815027
		11.00	.4331		S1855110	S1860110	
Z Ø11.11(.437) to Ø12.95(.510)	7/16	11.11	.4375	2.4 (3/32)			S1815028
		12.00	.4724			S1860120	
	31/64	12.30	.4844				S1815031
		12.50	.4921				S1865125
	1/2	12.70	.5000				S1815032
0 Ø12.98 (.511) to Ø17.65 (.695)		13.00	.5118	3.2 (1/8)	S1855130		S1865130
		13.50	.5315		S1855135		S1865135
	35/64	13.89	.5469				
		14.00	.5512		S1855140		S1865140
		14.50	.5709		S1855145		S1865145
	37/64	14.68	.5781				S1815037
		15.00	.5906		S1855150		S1865150
	19/32	15.08	.5938				S1815038
	39/64	15.48	.6094				S1815039
		15.50	.6102				S1865155
	5/8	15.88	.6250				S1815040
		16.00	.6299				S1865160
		16.50	.6496		S1855165		S1865165
		17.00	.6693				S1865170
	11/16	17.46	.6875				S1815044
		17.50	.6890				S1865175

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

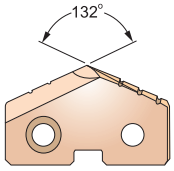
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				○	○	○	○	○			◎			

SPADE DRILLS

SERIES 3

SPADE DRILL INSERTS - CARBIDE P40

EINWEG BOHREINSATZ - VOLLHARTMETALL P40
Plaquettes SPADE DRILL - Carbure P40
CUSPIDI SPADE DRILL - MD P40



- For general use in carbon steels and alloy steels.
- Set up time can be reduced due to changing inserts easily on the machine.
- Any non-standard size available.

- Für allgemeine Anwendung in Kohlenstoffstählen und legierten Stählen
- Reduzierte Rüstzeiten, einfacher Einsatzwechsel auf der Maschine
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A361

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No.		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	CARBIDE P40		
					TiN	TiCN	TiAlN
3 Ø34.37 (1.353) to Ø47.80 (1.882)		36.00	1.4173	6.4 (1/4)			S1865360
	1-7/16	36.51	1.4375		S1805128		
		37.00	1.4567				S1865370
		38.00	1.4961				S1865380
	1-9/16	39.69	1.5625				S1815136
		40.00	1.5748		S1855400		S1865400
	1-19/32	40.48	1.5938		S1805138		
		42.00	1.6535			S1860420	
		43.00	1.6929				S1865430
		45.00	1.7717				S1865450
		47.00	1.8504				S1865470

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

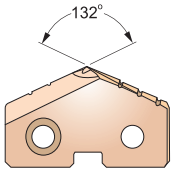
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				○	○	○	○	○			◎			

SPADE DRILLS

SERIES 1, 2, 3

SM-POINT SPADE DRILL INSERTS - HSS M4

SM-POINT EINWEG BOHREINSATZ - HSS M4
Plaquettes SPADE DRILL, pointe SM - HSS M4
CUSPIDI, SM-POINT - HSS M4



- For general use in steels and cast irons.
- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

- Für allgemeine Anwendung in Stahl und Gusseisen
- Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelteQ uerschneidengeometrie
- Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- Jede Abmessung außerhalb des Kataloges lieferbar

cutting conditions : p.A356

Series Min. to Max. mm (inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm, inch)	EDP No. HSS M4 TiN	EDP No. HSS M4 TiCN	EDP No. HSS M4 TiAlN
1 Ø17.53 (.690) to Ø24.38 (.960)		18.00	.7087	4.0 (5/32)			SM465180
		20.00	.7874				SM465200
		20.50	.8071				SM465205
		21.00	.8268				SM465210
2 Ø24.41 (.961) to Ø35.05 (1.380)	63/64	25.00	.9843				SM465250
		26.00	1.0236			SM460260	
		34.00	1.3386				SM465340
	1-3/8	34.93	1.3750		SM405124		
3 Ø34.37 (1.353) to Ø47.80 (1.882)		38.00	1.4961	6.4 (1/4)	SM455380		SM465380
		39.00	1.5354		SM455390		
		40.00	1.5748		SM455400		SM465400
		42.00	1.6535		SM455420		SM465420
	1-11/16	42.86	1.6875				SM415144
		43.00	1.6929		SM455430		SM465430
		44.00	1.7323				SM465440
		45.00	1.7717		SM455450		SM465450
		46.00	1.8110				SM465460

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○								◎	○	◎	○	◎	○

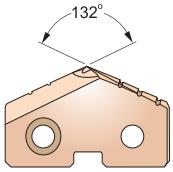
ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎					◎														

SPADE DRILLS

SERIES 1, 2

SM-POINT SPADE DRILL INSERTS - SUPER HSS T15

SM-POINT EINWEG BOHREINSATZ - SUPER HSS T15
Plaquettes SPADE DRILL, pointe SM - Super HSS T15
CUSPIDI DI FORATURA SM-POINT - SUPER HSS T15



- For use in high nickel alloys and materials over 280 Brinell.
- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Zur Anwendung bei legierten Stählen mit hohem Nickelanteil und Werkstoffen über 280 Brinell
- Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelteQ uerschneidengeometrie
- Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- Jede Abmessung außerhalb des Kataloges lieferbar

cutting conditions : p.A349

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No. SUPER HSS T15	
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	TiN	TiAlN
1 Ø17.53 (.690) to Ø24.38 (.960)		18.00	.7087	4.0 (5/32)		SM165180
	23/32	18.26	.7188			SM115046
		18.50	.7283			SM165185
		19.00	.7480		SM155190	SM165190
	3/4	19.05	.7500			SM115048
	49/64	19.45	.7656			SM115049
		19.50	.7677			SM165195
		20.00	.7874		SM155200	SM165200
		20.50	.8071		SM155205	SM165205
	13/16	20.64	.8125			SM115052
		21.00	.8268			SM165210
	27/32	21.43	.8438			SM115054
		22.00	.8661			SM165220
	7/8	22.23	.8750			SM115056
		23.00	.9055			SM165230
	29/32	23.02	.9062			SM115058
	59/64	23.42	.9219			SM115059
	15/16	23.81	.9375			SM115060
		24.00	.9449		SM155240	SM165240
2 Ø24.41 (.961) to Ø35.05 (1.380)	63/64	25.00	.9843	4.8 (3/16)	SM155250	SM165250
	1	25.40	1.0000			SM115100
		26.00	1.0236		SM155260	SM165260
	1-3/64	26.59	1.0469			SM115103
	1-1/16	26.99	1.0625			SM115104
		27.00	1.0630			SM165270
		28.00	1.1024		SM155280	SM165280
		29.00	1.1417		SM155290	SM165290
		30.00	1.1811		SM155300	SM165300
	1-3/16	30.16	1.1875			SM115112
		31.00	1.2205		SM155310	SM165310
	1-1/4	31.75	1.2500			SM115116
		32.00	1.2598		SM155320	SM165320
	1-9/32	32.54	1.2812			SM115118
		33.00	1.2992			SM165330
		34.00	1.3386			SM165340
	1-3/8	34.93	1.3750			SM115124
		35.00	1.3780		SM155350	SM165350

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	○	○	○	○	○	○	○	○	◎	○	◎	○	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				◎	○	○	○	○			○			

SPADE DRILLS

SERIES Y, Z, 0

SM-POINT SPADE DRILL INSERTS - PREMIUM HSS M48

SM-POINT EINWEG BOHREINSATZ - PREMIUM HSS M48
Plaquettes SPADE DRILL, pointe SM - HSS Premium M48
CUSPIDI, SM-POINT - PREMIUM HSS M48

- For use in high temperature alloys and materials with 350~500 Brinell.
- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Zur Anwendung bei hitzebeständigen Legierungen und Werkstoffen mit 350~500 Brinell
- Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschneidengeometrie
- Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- Jede Abmessung außerhalb des Kataloges lieferbar

cutting conditions : p.A358

Series Min. to Max. mm (inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm, inch)	EDP No. PREMIUM HSS M48 TiN	EDP No. PREMIUM HSS M48 TiCN	EDP No. PREMIUM HSS M48 TiAlN
Y Ø9.50 (.374) to Ø11.07 (.436)		9.50	.3740	2.4 (3/32)	SM555095		SM565095
		9.80	.3858		SM555098		SM565098
		10.00	.3937		SM555100		SM565100
		10.20	.4016		SM555102		SM565102
	13/32	10.32	.4062				SM515026
		10.50	.4134		SM555105		SM565105
		10.80	.4252		SM555108		SM565108
		11.00	.4331		SM555110		SM565110
Z Ø11.11 (.437) to Ø12.95 (.510)	7/16	11.11	.4375	2.4 (3/32)			SM515028
		12.00	.4724		SM555120		SM565120
0 Ø12.98 (.511) to Ø17.65 (.695)		13.00	.5118	3.2 (1/8)	SM555130		
	17/32	13.49	.5312				SM515034
		13.50	.5315		SM555135		SM565135
		14.00	.5512				SM565140
		14.50	.5709		SM555145		
		15.00	.5906				SM565150
	19/32	15.08	.5938				SM515038
	39/64	15.48	.6094				SM515039
		15.50	.6102		SM555155		SM565155
	5/8	15.88	.6250				
		16.00	.6299		SM555160		SM565160
	41/64	16.27	.6406				SM515041
		16.50	.6496				SM565165
		17.00	.6693				SM565170
		17.50	.6890		SM555175		SM565175

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	○	○	○	○	◎	○	◎	○	◎

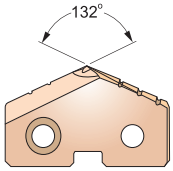
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				◎	◎	◎	◎	◎			◎			

SPADE DRILLS

SERIES 2

SM-POINT SPADE DRILL INSERTS - PREMIUM HSS M48

SM-POINT EINWEG BOHREINSATZ - PREMIUM HSS M48
Plaquettes SPADE DRILL, pointe SM - HSS Premium M48
CUSPIDI, SM-POINT - PREMIUM HSS M48



- For use in high temperature alloys and materials with 350~500 Brinell.
- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Zur Anwendung bei hitzebeständigen Legierungen und Werkstoffen mit 350~500 Brinell
- Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschneidengeometrie
- Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- Jede Abmessung außerhalb des Kataloges lieferbar

Cutting conditions : p.A358

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No.		
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	PREMIUM HSS M48		
					TiN		TiAlN
2 Ø24.41 (.961) to Ø35.05 (1.380)	31/32	24.61	.9688	4.8 (3/16)			SM515062
	63/64	25.00	.9843		SM555250		SM565250
	1-1/64	25.80	1.0156				SM515101
		26.00	1.0236		SM555260		SM565260
	1-3/64	26.59	1.0469				SM515103
		27.00	1.0630				SM565270
	1-3/32	27.78	1.0938				SM515106
		28.00	1.1024		SM555280		SM565280
		29.00	1.1417		SM555290		SM565290
		30.00	1.1811		SM555300		SM565300
	1-7/32	30.96	1.2188				SM515114
		31.00	1.2205		SM555310		SM565310
		32.00	1.2598			SM560320	SM565320
		33.00	1.2992		SM555330		SM565330
		34.00	1.3386		SM555340		SM565340
		35.00	1.3780		SM555350		SM565350

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	○	○	○	○	◎	○	◎	○	◎

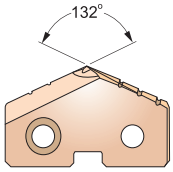
ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				◎	◎	◎	◎	◎			◎			

SPADE DRILLS

SERIES 1, 2

SM-POINT SPADE DRILL INSERTS for CAST IRON - CARBIDE K10

SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL K10
Plaquettes SPADE DRILL, pointe SM pour la fonte - Carbure K10
CUSPIDI SM-POINT - MD K10



- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys.
- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Beste Leistung in Grauguss über 220 Brinell, kurzspanendem Kugelgraphitguss, Si-Aluminium und Kupferlegierungen
- Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschneidengeometrie
- Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- Jede Abmessung außerhalb des Kataloges lieferbar

cutting conditions : p.A359

Series Min. to Max. mm (inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm, inch)	EDP No. CARBIDE K10 TiN	EDP No. CARBIDE K10 TiAlN
1 Ø17.53 (.690) to Ø24.38 (.960)		19.00	.7480	4.0 (5/32)	SM655190	
		19.50	.7677		SM655195	
		20.00	.7874		SM655200	
		20.50	.8071		SM655205	
		22.00	.8661		SM655220	
		24.00	.9449			SM665240
2 Ø24.41(.961) to Ø35.05 (1.380)		30.00	1.1811	4.8 (3/16)	SM655300	
		32.00	1.2598		SM655320	
		34.00	1.3386		SM655340	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended															◎	◎	◎	◎	◎	◎

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

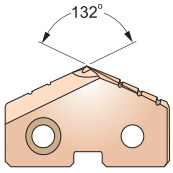
phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

SPADE DRILLS

SERIES 1, 2, 3

SM-POINT SPADE DRILL INSERTS - CARBIDE K20

SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL K20
Plaquettes SPADE DRILL, pointe SM - Carbure K20
CUSPIDI SM-POINT - MD K20



- For use in Gray cast iron up to 220 Brinell, nonferrous metals, copper, brass and aluminum.
- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Zur Anwendung in Grauguss bis 220 Brinell, Nichteisen - Metallen, Kupfer, Messing und Aluminium
- Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschneidengeometrie
- Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- Jede Abmessung außerhalb des Kataloges lieferba

cutting conditions : p.A359

Series Min. to Max. mm (inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm, inch)	EDP No. CARBIDE K20 TiN	EDP No. CARBIDE K20 TiAlN
1 Ø17.53 (.690) to Ø24.38 (.960)		18.00	.7087	4.0 (5/32)	SM755180	SM765180
		18.50	.7283		SM755185	SM765185
		19.00	.7480			SM765190
		19.50	.7677			SM765195
		20.00	.7874			SM765200
	51/64	20.24	.7969			SM715051
		20.50	.8071		SM755205	SM765205
	13/16	20.64	.8125			SM715052
		21.00	.8268			SM765210
		22.00	.8661			SM765220
	7/8	22.23	.8750		SM705056	
		23.00	.9055			SM765230
		24.00	.9449			SM765240
2 Ø24.41(.961) to Ø35.05 (1.380)	63/64	25.00	.9843	4.8 (3/16)		SM765250
	1	25.40	1.0000			SM715100
		26.00	1.0236			SM765260
	1-3/64	26.59	1.0469			SM715103
		27.00	1.0630			SM765270
		30.00	1.1811			SM765300
	1-3/16	30.16	1.1875		SM705112	
		32.00	1.2598			SM765320
		33.00	1.2992			SM765330
		34.00	1.3386			SM765340
3 Ø34.37 (1.353) to Ø47.80 (1.882)	1-15/32	37.31	1.4688	6.4 (1/4)		SM715130
		38.00	1.4961			SM765380
		39.00	1.5354			SM765390
		43.00	1.6929			SM765430
		44.00	1.7323			SM765440
	1-13/16	46.04	1.8125		SM705152	
		44.00	1.7323		SM755440	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

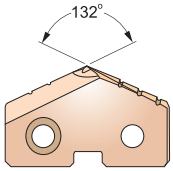
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎					◎				◎	◎	◎	◎	◎			○			

SPADE DRILLS

SERIES 1, 2

SM-POINT SPADE DRILL INSERTS - CARBIDE P40

SM-POINT EINWEG BOHREINSATZ - VOLLHARTMETALL P40
Plaquettes SPADE DRILL, pointe SM - Carbure P40
CUSPIDI SM-POINT - MD P40



- For general use in carbon steels and alloys steels.
- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Für allgemeine Anwendung in Kohlenstoffstählen und legierten Stählen
- Erhöhte Stabilität und Fluchtgenauigkeit durch neu entwickelte Querschneidengeometrie
- Verminderte Bohrkraft und ausgezeichnete Selbstzentrierung
- Jede Abmessung außerhalb des Kataloges lieferbar

cutting conditions : p.A361

Series Min. to Max. mm (inch)	Diameter Inch (inch)	Diameter Metric (mm)	Diameter Decimal (inch)	Thick Metric (mm, inch)	EDP No. CARBIDE P40 TiN	EDP No. CARBIDE P40 TiCN	EDP No. CARBIDE P40 TiAlN
1 Ø17.53 (.690) to Ø24.38 (.960)	45/64	17.86	.7031	4.0 (5/32)			SM815045
		18.00	.7087		SM855180		SM865180
		18.50	.7283		SM855185		SM865185
		19.00	.7480				SM865190
		19.50	.7677				SM865195
		20.00	.7874			SM860200	SM865200
	51/64	20.24	.7969				SM815051
		20.50	.8071				SM865205
		21.00	.8268				SM865210
	27/32	21.43	.8438				SM815054
		22.00	.8661				SM865220
		23.00	.9055				SM865230
		24.00	.9449				SM865240
2 Ø24.41 (.961) to Ø35.05 (1.380)	63/64	25.00	.9843	4.8 (3/16)			SM865250
	1	25.40	1.0000				SM815100
		26.00	1.0236		SM855260		SM865260
	1-1/32	26.19	1.0312				SM815102
	1-3/64	26.59	1.0469				SM815103
		27.00	1.0630				SM865270
	1-3/32	27.78	1.0938				SM815106
		28.00	1.1024				SM865280
	1-5/32	29.37	1.1562		SM805110		
		30.00	1.1811				SM865300
	1-3/16	30.16	1.1875				SM815112
	1-7/32	30.96	1.2188				SM815114
		31.00	1.2205				SM865310
		32.00	1.2598				SM865320
		33.00	1.2992				SM865330
	1-5/16	33.34	1.3125				SM815120
		34.00	1.3386				SM865340
		35.00	1.3780				SM865350

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

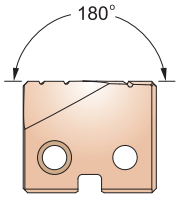
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				○	○	○	○	○			◎			

SPADE DRILLS

SERIES Y, Z, 0

SPADE DRILL INSERTS - SUPER COBALT T15 FLAT BOTTOM

SPADE DRILL BOHRER-EINSÄTZE - SUPER COBALT T15 (FLACH-NUT)
Plaquettes SPADE DRILL à fond plat - Super Cobalt T15
INSERTI SPADE DRILL - SUPER HSS T15 FONDO PIATTO



cutting conditions : p.A352

Series Min. to Max. mm (inch)	Diameter			Thick	EDP No.	
	Inch (inch)	Metric (mm)	Decimal (inch)	Metric (mm, inch)	SUPER HSS T15 TiN	SUPER HSS T15 TiAlN
Y Ø9.50 (.374) to Ø11.07 (.436)		9.50	.3740	2.4 (3/32)	S215509	
		9.80	.3858			S2165098
		10.00	.3937			S2165100
		10.20	.4016			S2165102
		10.50	.4134			S2165105
		10.80	.4252			S2165108
Z Ø11.11 (.437) to Ø12.95 (.510)		11.50	.4528	2.4 (3/32)		S2165115
0 Ø12.98 (.511) to Ø17.65 (.695)		13.00	.5118	3.2 (1/8)		S2165130
		14.00	.5512			S2165140
		14.50	.5709			S2165145
		15.00	.5906			S2165150
		15.50	.6102			S2165155
		16.00	.6299			S2165160
		16.50	.6496			S2165165
		17.00	.6693			S2165170
		17.50	.6890			S2165175

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎	○	○	○	○	○	○	○	○	◎	○	◎	○	◎

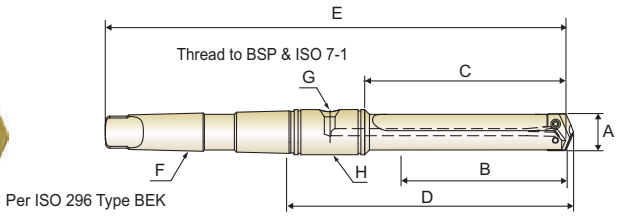
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○					○				◎	○	○	○	○			○			

SPADE DRILLS

ZSTSMT** SERIES
ZITHMT** SERIES

TAPER SHANK HOLDERS

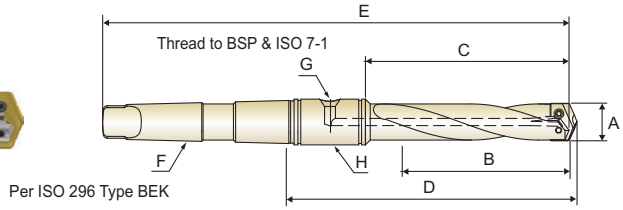
- HALTER MIT MORSEKEGEL
- Porte-plaquette à queue cône morse
- PUNTE CON ATTACCO CM



SHORT LENGTH - Straight Flute (Metric)

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Body Length	Ref. Length	Overall Length	MT	Pipe Tap	RCA
		A	B	C	D	E	F	G	H
Y	ZY0STSMT02M	9.5 ~ 11.0	31.8	51.5	88.0	160.3	#2	1/16	PR120190
Z	ZZ0STSMT02M	11.5 ~ 12.5	31.8	51.5	88.0	160.3	#2	1/16	PR120190
0	Z00STSMT02M	13.0 ~ 17.5	35.0	55.5	92.4	164.3	#2	1/16	PR120190
0.5	Z05STSMT02M	15.5 ~ 17.5	35.0	55.5	92.4	164.3	#2	1/16	PR120190
1	Z10STSMT03M	18.0 ~ 24.0	69.8	98.4	142.5	232.5	#3	1/8	PR120254
1.5	Z15STSMT03M	22.0 ~ 24.0	69.8	98.4	142.5	232.5	#3	1/8	PR120254
2	Z20STSMT04M	25.0 ~ 35.0	85.7	114.3	160.4	273.8	#4	1/8	PR120254
2.5	Z25STSMT04M	30.0 ~ 35.0	85.7	114.3	167.6	281.0	#4	1/4	PR120317
3	Z30STSMT04M	36.0 ~ 47.0	120.6	152.4	206.4	319.1	#4	1/4	PR120317
4	Z40STSMT05M	48.0 ~ 65.0	130.1	165.1	219.1	363.5	#5	1/4	PR120444
5~6	Z50STSMT05M	64.0 ~ 88.0	171.5	215.9	287.3	430.2	#5	1/2	PR120571
7~8	Z70STSMT05M	90.0 ~ 114.0	171.5	225.4	296.8	439.7	#5	1/2	PR120571

▶ You can also apply RCA(Rotary Coolant Adapter) for internal cooling. (See page 374)



INTERMEDIATE LENGTH - Helical Flute (Metric)

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Body Length	Ref. Length	Overall Length	MT	Pipe Tap	RCA
		A	B	C	D	E	F	G	H
1	Z10ITHMT03M	18.0 ~ 24.0	120.7	149.2	193.3	283.3	#3	1/8	PR120254
1.5	Z15ITHMT03M	22.0 ~ 24.0	120.7	149.2	193.3	283.3	#3	1/8	PR120254
2	Z20ITHMT04M	25.0 ~ 35.0	136.5	165.1	211.2	324.6	#4	1/8	PR120254
2.5	Z25ITHMT04M	30.0 ~ 35.0	136.5	165.1	218.4	331.8	#4	1/4	PR120317
3	Z30ITHMT04M	36.0 ~ 47.0	165.1	196.9	250.9	363.6	#4	1/4	PR120317

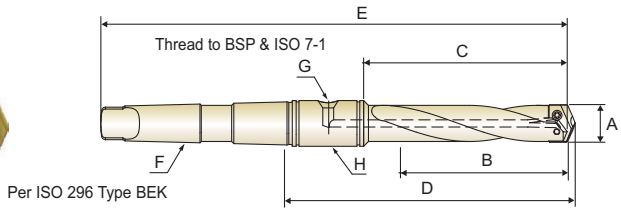
▶ You can also apply **RCA**(**R**otary **C**oolant **A**dapter) for internal cooling. (See page 374)

SPADE DRILLS

Z**EXHMT SERIES
Z**EXSMT SERIES

TAPER SHANK HOLDERS

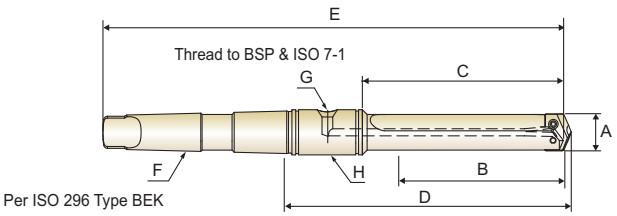
- HALTER MIT MORSEKEGEL
- Porte-plaquette à queue cône morse
- PUNTE CON ATTACCO CM



EXTENDED LENGTH - Helical Flute (Metric)

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Body Length	Ref. Length	Overall Length	MT	Pipe Tap	RCA
		A	B	C	D	E	F	G	H
Y	ZY0EXHMT02M	9.5 ~ 11.0	111.1	130.9	167.4	239.7	#2	1/16	PR120190
Z	ZZ0EXHMT02M	11.5 ~ 12.5	111.1	130.9	167.4	239.7	#2	1/16	PR120190
0	Z00EXHMT02M	13.0 ~ 17.5	114.3	135.0	171.8	243.7	#2	1/16	PR120190
1	Z10EXHMT03M	18.0 ~ 24.0	273.1	301.6	345.7	435.8	#3	1/8	PR120254
1.5	Z15EXHMT03M	22.0 ~ 24.0	273.1	301.6	345.7	435.8	#3	1/8	PR120254
2	Z20EXHMT04M	25.0 ~ 35.0	289.0	317.5	363.6	477.0	#4	1/8	PR120254
2.5	Z25EXHMT04M	30.0 ~ 35.0	289.0	317.5	370.8	484.2	#4	1/4	PR120317

▶ You can also apply RCA(Rotary Coolant Adapter) for internal cooling. (See page 374)



EXTENDED LENGTH - Straight Flute (Metric)

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Body Length	Ref. Length	Overall Length	MT	Pipe Tap	RCA
		A	B	C	D	E	F	G	H
3	Z30EXSMT04M	36.0 ~ 47.0	349.3	381.0	435.0	547.7	#4	1/4	PR120317
4	Z40EXSMT05M	48.0 ~ 65.0	422.3	457.2	511.2	655.6	#5	1/4	PR120444
5~6	Z50EXSMT05M	64.0 ~ 88.0	463.6	508.0	579.4	722.3	#5	1/2	PR120571
7~8	Z70EXSMT05M	90.0 ~ 114.0	555.6	609.6	681.1	823.9	#5	1/2	PR120571

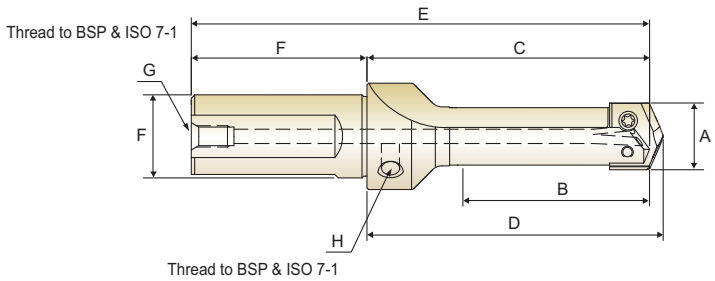
▶ You can also apply RCA(Rotary Coolant Adapter) for internal cooling. (See page 374)

SPADE DRILLS

ZSBSF** SERIES
ZSTSF** SERIES

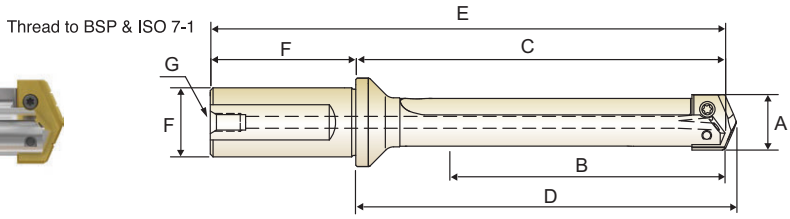
FLANGED STRAIGHT SHANK HOLDERS

- HALTER MIT ZYLINDERSCHAFT UND SPANNFLÄCHE
- Porte-plaquette à collerette queue cylindrique
- PUNTE ATTACCO CILINDRICO FLANGIATO



STUB LENGTH - Straight Flute (Metric)

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Body Length	Ref. Length	Overall Length	Shank		Pipe Tap	
							Dia.	Length	Rear	Side
		A	B	C	D	E	F		G	H
Y	ZY0SBSF016M	9.5 ~ 11.0	19.1	47.6	50.0	95.6	16.0	48.0	1/16	1/8
Z	ZZ0SBSF016M	11.5 ~ 12.5	19.1	47.6	50.0	95.6	16.0	48.0	1/16	1/8
0	Z00SBSF020M	13.0 ~ 17.5	22.2	47.6	50.4	97.6	20.0	50.0	1/8	1/8
0.5	Z05SBSF020M	15.5 ~ 17.5	22.2	47.6	50.4	97.6	20.0	50.0	1/8	1/8
1	Z10SBSF025M	18.0 ~ 24.0	47.6	75.8	79.4	131.8	25.0	56.0	1/8	1/8
1.5	Z15SBSF025M	22.0 ~ 24.0	57.2	88.5	92.1	144.5	25.0	56.0	1/8	1/8
2	Z20SBSF032M	25.0 ~ 35.0	57.2	88.5	92.1	148.5	32.0	60.0	1/4	1/8
2.5	Z25SBSF032M	30.0 ~ 35.0	92.1	123.4	127.0	183.4	32.0	60.0	1/4	1/8
3	Z30SBSF040M	36.0 ~ 47.0	76.2	125.0	129.8	195.0	40.0	70.0	1/4	1/4



SHORT LENGTH - Straight Flute (Metric)

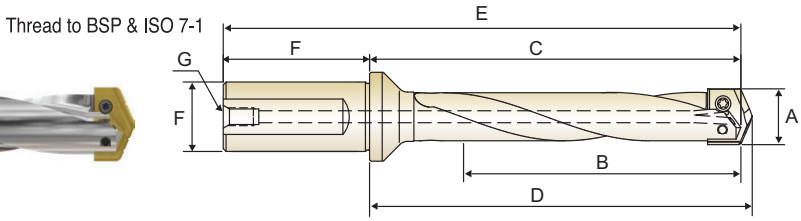
Series	EDP No.	Drill Insert Range	Max. Drill Depth	Body Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	ZY0STSF020M	9.5 ~ 11.0	31.8	61.1	63.5	111.1	20.0	50.0	1/8
Z	ZZ0STSF020M	11.5 ~ 12.5	31.8	61.1	63.5	111.1	20.0	50.0	1/8
0	Z00STSF020M	13.0 ~ 17.5	34.9	63.5	66.3	113.5	20.0	50.0	1/8
0.5	Z05STSF020M	15.5 ~ 17.5	34.9	63.5	66.3	113.5	20.0	50.0	1/8
1	Z10STSF025M	18.0 ~ 24.0	66.7	107.2	110.7	163.2	25.0	56.0	1/8
1.5	Z15STSF025M	22.0 ~ 24.0	66.7	107.2	110.7	163.2	25.0	56.0	1/8
2	Z20STSF032M	25.0 ~ 35.0	85.7	128.6	132.2	188.6	32.0	60.0	1/4
2.5	Z25STSF032M	30.0 ~ 35.0	85.7	128.6	132.2	188.6	32.0	60.0	1/4
3	Z30STSF040M	36.0 ~ 47.0	120.7	173.0	177.8	243.0	40.0	70.0	1/4
4	Z40STSF040M	48.0 ~ 65.0	130.2	179.4	184.0	249.4	40.0	70.0	1/4

SPADE DRILLS

Z**EXHF SERIES
Z**EXSF SERIES

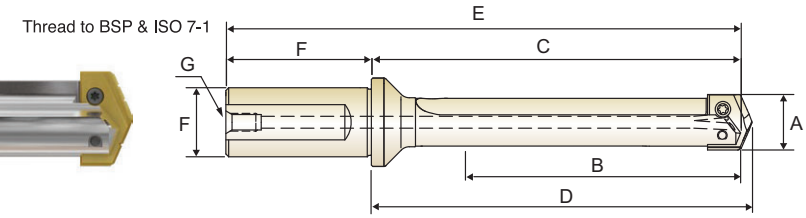
FLANGED STRAIGHT SHANK HOLDERS

HALTER MIT ZYLINDERSCHAFT UND SPANNFLÄCHE
Porte-plaquette à collerette queue cylindrique
PUNTE ATTACCO CILINDRICO FLANGIATO



EXTENDED LENGTH - Helical Flute (Metric)

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Body Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
Y	ZY0EXHF020M	9.5 ~ 11.0	111.1	140.5	142.9	190.5	20.0	50.0	1/8
Z	ZZ0EXHF020M	11.5 ~ 12.5	111.1	140.5	142.9	190.5	20.0	50.0	1/8
0	Z00EXHF020M	13.0 ~ 17.5	114.3	142.9	145.7	192.9	20.0	50.0	1/8
0.5	Z05EXHF020M	15.5 ~ 17.5	114.3	142.9	145.7	192.9	20.0	50.0	1/8
1	Z10EXHF025M	18.0 ~ 24.0	269.9	307.2	310.8	363.2	25.0	56.0	1/8
1.5	Z15EXHF025M	22.0 ~ 24.0	269.9	307.2	310.8	363.2	25.0	56.0	1/8
2	Z20EXHF032M	25.0 ~ 35.0	288.9	331.8	335.4	391.8	32.0	60.0	1/4
2.5	Z25EXHF032M	30.0 ~ 35.0	288.9	331.8	335.4	391.8	32.0	60.0	1/4



EXTENDED LENGTH - Straight Flute (Metric)

Series	EDP No.	Drill Insert Range	Max. Drill Depth	Body Length	Ref. Length	Overall Length	Shank		Pipe Tap
							Dia.	Length	
		A	B	C	D	E	F		G
3	Z30EXSF040M	36.0 ~ 47.0	349.3	401.6	406.4	471.6	40.0	70.0	1/4
4	Z40EXSF040M	48.0 ~ 65.0	422.3	471.5	476.3	541.5	40.0	70.0	1/4

SPADE DRILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

SPADE DRILL HSS M4

Vc = m/min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc			Feed						
			TiN	TiCN	TiAlN	Ø9.5-12.5	Ø13-17.5	Ø18-24	Ø25-35	Ø36-47	Ø48-65	Ø66-114
P	1	Non-alloy steel	54	67	75	0.15	0.22	0.28	0.37	0.46	0.56	0.67
	2		49	58	69	0.13	0.19	0.24	0.34	0.43	0.50	0.57
	3		45	56	63	0.13	0.19	0.23	0.34	0.43	0.50	0.58
	4		45	56	63	0.13	0.19	0.23	0.34	0.43	0.50	0.58
	6	Low alloy steel	45	56	58	0.13	0.20	0.24	0.36	0.42	0.46	0.55
	7		41	50	56	0.13	0.16	0.23	0.35	0.41	0.44	0.55
K	15	Grey cast iron	48	58	70	0.14	0.26	0.35	0.45	0.56	0.64	0.68
	16		29	35	41	0.10	0.15	0.16	0.23	0.28	0.35	0.40
	17	Nodular cast iron	48	58	70	0.14	0.26	0.35	0.45	0.56	0.64	0.68
	18		35	44	52	0.13	0.17	0.23	0.3	0.35	0.43	0.50
	19	Malleable cast iron	52	64	75	0.16	0.30	0.40	0.49	0.59	0.69	0.75
	20		35	44	52	0.13	0.17	0.23	0.30	0.35	0.43	0.50
N	21	Aluminum-wrought alloy	187	229	244	0.19	0.33	0.41	0.50	0.54	0.64	0.70
	22		92	137	137	0.19	0.33	0.41	0.46	0.54	0.64	0.70
	27	Copper and Copper Alloys (Bronze / Brass)	95	128	142	0.19	0.31	0.43	0.53	0.64	0.74	0.79

▶ The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.

SPADE DRILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

SPADE DRILL HSS M48

Vc = m/min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc			Feed						
			TiN	TiCN	TiAlN	Ø9.5-12.5	Ø13-17.5	Ø18-24	Ø25-35	Ø36-47	Ø48-65	Ø66-114
P	1	Non-alloy steel	54	67	75	0.15	0.22	0.28	0.37	0.46	0.56	0.67
	2		49	58	69	0.13	0.19	0.24	0.34	0.43	0.50	0.57
	3		45	56	63	0.13	0.19	0.23	0.34	0.43	0.50	0.58
	4		45	56	63	0.13	0.19	0.23	0.34	0.43	0.50	0.58
	6	Low alloy steel	45	56	58	0.13	0.20	0.24	0.36	0.42	0.46	0.55
	7		41	50	56	0.13	0.16	0.23	0.35	0.41	0.44	0.55
	8		39	47	53	0.09	0.15	0.22	0.28	0.38	0.41	0.50
	9		36	43	46	0.08	0.15	0.21	0.27	0.38	0.40	0.51
	10	High alloyed steel, and tool steel	25	34	36	0.08	0.17	0.20	0.24	0.30	0.37	0.39
	11		19	27	29	0.08	0.14	0.18	0.19	0.25	0.29	0.34
M	12	Stainless steel	20	23	29	0.12	0.18	0.20	0.24	0.30	0.36	0.46
	13		20	23	29	0.12	0.18	0.20	0.24	0.30	0.36	0.46
	14		24	29	34	0.14	0.20	0.23	0.26	0.36	0.41	0.50
K	15	Grey cast iron	48	58	70	0.14	0.26	0.35	0.45	0.56	0.64	0.68
	16		29	35	41	0.10	0.15	0.16	0.23	0.28	0.35	0.40
	17	Nodular cast iron	48	58	70	0.14	0.26	0.35	0.45	0.56	0.64	0.68
	18		35	44	52	0.13	0.17	0.23	0.30	0.35	0.43	0.50
	19	Malleable cast iron	52	64	75	0.16	0.30	0.40	0.49	0.59	0.69	0.75
	20		35	44	52	0.13	0.17	0.23	0.30	0.35	0.43	0.50
N	21	Aluminum-wrought alloy	187	229	244	0.19	0.33	0.41	0.50	0.54	0.64	0.70
	22		92	137	137	0.19	0.33	0.41	0.46	0.54	0.64	0.70
	27	Copper and Copper Alloys (Bronze / Brass)	95	128	142	0.19	0.31	0.43	0.53	0.64	0.74	0.79
S	31	Heat Resistant Super Alloys	9	11	12	0.08	0.17	0.20	0.24	0.30	0.37	0.39
	32		8	9	11	0.08	0.14	0.18	0.19	0.25	0.29	0.34
	33		8	9	11	0.08	0.14	0.18	0.19	0.25	0.29	0.34
	34		8	9	11	0.08	0.14	0.18	0.19	0.25	0.29	0.34
	35		8	9	11	0.08	0.14	0.18	0.19	0.25	0.29	0.34
H	38	Hardened steel	20	23	29	0.12	0.18	0.20	0.24	0.30	0.36	0.46

▶ The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.

SPADE DRILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

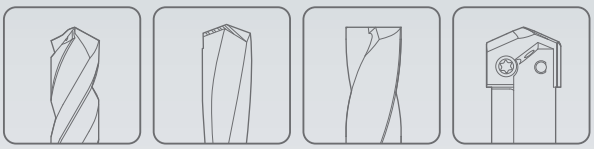
SPADE DRILL FLAT BOTTOM HSS T15

Vc = m/min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc		Feed			
			TiN	TiAlN	Ø9.5-12.5	Ø13-17.5	Ø18-24	Ø25-35
P	1	Non-alloy steel	54	60	0.12	0.18	0.22	0.30
	2		46	55	0.10	0.15	0.19	0.27
	3		45	50	0.10	0.15	0.18	0.27
	4		42	46	0.08	0.14	0.17	0.22
	6	Low alloy steel	45	46	0.10	0.16	0.19	0.29
	7		40	45	0.10	0.13	0.18	0.28
	8		38	42	0.07	0.12	0.18	0.22
	9		34	37	0.06	0.12	0.17	0.22
	10	High alloyed steel, and tool steel	27	29	0.07	0.12	0.15	0.20
	11		22	23	0.07	0.12	0.15	0.20
M	12	Stainless steel	23	25	0.13	0.15	0.18	0.22
	13		23	25	0.13	0.15	0.18	0.22
	14		26	29	0.17	0.18	0.20	0.23
K	15	Grey cast iron	51	60	0.12	0.21	0.29	0.40
	16		38	48	0.10	0.14	0.20	0.25
	17	Nodular cast iron	51	60	0.12	0.21	0.29	0.40
	18		38	48	0.10	0.14	0.20	0.25
	19	Malleable cast iron	56	66	0.13	0.25	0.35	0.41
	20		38	48	0.10	0.14	0.20	0.25
N	21	Aluminum-wrought alloy	208	213	0.17	0.28	0.36	0.43
	22		112	121	0.17	0.28	0.36	0.41
	27	Copper and Copper Alloys (Bronze / Brass)	48	70	0.15	0.26	0.37	0.45
S	31	Heat Resistant Super Alloys	20	10	0.06	0.14	0.16	0.19
	32		7	9	0.06	0.11	0.14	0.15
	33		7	9	0.06	0.11	0.14	0.15
	34		7	9	0.06	0.11	0.14	0.15
	35		7	9	0.06	0.11	0.14	0.15
H	38	Hardened steel	23	25	0.13	0.15	0.18	0.22

▶ The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.

Global Cutting Tool Leader **YG-1**



HOLEMAKING

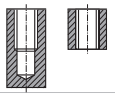
Leading Through Innovation

CARBIDE, HSS & HSS-E

REAMERS

REIBAHLEN

- **Carbide NC Machine Reamers**
  HSS Hand Reamers, HSS-E Chucking Reamers
- **Hartmetall NC Maschinenreibahlen**
  HSS-Handreibahlen, HSS-E Spannfutter-Reibahlen

SERIES	K4101	K4111
HOLE TYPE		
FLUTE TYPE	Straight	LH Spiral
SIZE MIN	D2.0	D2.0
SIZE MAX	D20.0	D20.0
PAGE	A366	A367
SURFACE TREATMENT	Bright	

CARBIDE, HSS & HSS-E REAMERS

Carbide NC Machine Reamers
HSS Hand Reamers
HSS-E Chucking Reamers

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A387

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	K4101	K4111
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	○	○
	5		About 0.75% C	Quenched & Tempered	300	32	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29	◎	◎
	8			Quenched & Tempered	300	32	○	○
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○
	14		Austenitic		180	10	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎
	16		Pearlitic (Martensitic)		260	26	○	○
	17	Nodular cast iron	Ferritic		160	3	◎	◎
	18		Pearlitic		250	25	○	○
	19	Malleable cast iron	Ferritic		130		◎	◎
	20		Pearlitic		230	21	○	○
N	21	Aluminum-wrought alloy	Not Curable		60		○	○
	22		Curable	Hardened	100		○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○
	27		CuZn, CuSnZn (Brass)		90		○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

REAMERS

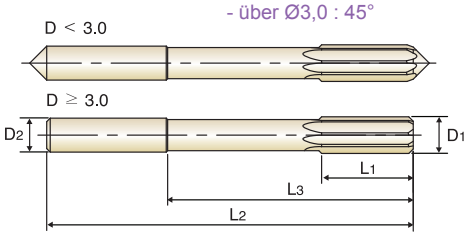
K4101 SERIES

CARBIDE, NC MACHINE REAMERS - STRAIGHT FLUTES

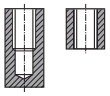
VHM, NC-MASCHINENREIBAHLEN - GERADEGENUTET
ALÉSOIRS CARBURE MACHINE CN - ENTRÉE DROITE
ALESATORI A MACCHINA IN MD - ELICA DRITTA

- Material - Up to Ø12.0 : Solid Carbide
  - Over Ø12.0 : Carbide Head Brazed
- Straight Flutes, Right Hand Cut
- Unequal Flute Spacing
- O.D. Tolerances : DIN 1420 for H7
- Shank : DIN 6535-HA
- Chamfer Angle - D<3.0 : 15°
  - D≥3.0 : 45°

- Material - bis Ø12,0 : VHM
  - über Ø12,0 : gelötete VHM-Köpfe
- geradegenutet, rechtsschneidend
- Ungleichteilung
- Ø Toleranzen : DIN 1420 für H7
- Schaft : DIN 6535-HA
- Anschnittwinkel - bis Ø3,0 : 15°
  - über Ø3,0 : 45°



Hole type



CARBIDE | H7 | 15° | 45° | Bright

D<3.0 D≥3.0

p.A387

Unit : mm

EDP No.	Reamer Diameter D1	Shank Diameter D2	Cutting Length L1	Neck Length L3	Overall Length L2	No. of Flute
K410100200	2.0	4	11	20	50	4
K410100250	2.5	4	14	26	57	4
K410100300	3.0	4	15	31	61	6
K410100350	3.5	4	18	36	70	6
K410100400	4.0	4	19	42	75	6
K410100450	4.5	6	21	46	80	6
K410100500	5.0	6	23	51	86	6
K410100600	6.0	6	26	56	93	6
K410100650	6.5	8	28	62	101	6
K410100700	7.0	8	31	68	109	6
K410100750	7.5	8	31	68	109	6
K410100800	8.0	8	33	74	117	6
K410100850	8.5	10	33	74	117	6
K410100900	9.0	10	36	80	125	6
K410100950	9.5	10	36	80	125	6
K410101000	10.0	10	38	86	133	6
K410101050	10.5	12	38	86	133	6
K410101100	11.0	12	41	95	142	6
K410101200	12.0	12	44	104	151	6
K410101300	13.0	16	44	104	151	6
K410101400	14.0	16	47	108	160	8
K410101500	15.0	16	50	110	162	8
K410101600	16.0	16	52	118	170	8
K410101700	17.0	20	54	121	175	8
K410101800	18.0	20	56	128	182	8
K410101900	19.0	20	58	129	189	8
K410102000	20.0	20	60	135	195	8

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	○	○	◎	◎	○		○		○	○	○	◎	○	◎	○	◎	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

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YG REAMERS

K1143 SERIES

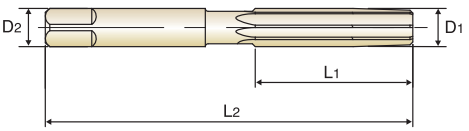
HSS, HAND REAMERS - STRAIGHT FLUTES

HSS, HANDREIBAHLEN - GERADEGENUTET
ALÉSOIRS HSS À MAIN - HÉLICE À GAUCHE
ALESATORI A MANO IN HSS - ELICA SINISTRA

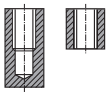
- ▶ O.D. Tolerances : DIN 1420 for H7
- ▶ Shank Diameter ≒ Nominal Reamer Diameter
- ▶ Straight Flutes / Right Hand Cut
- ▶ Chamfer Angle - tapered
- ▶ Type of center - Up to Ø3.75 : external centers
  - Over Ø3.75 : internal centers

- ▶ Schneiden-Ø Toleranzen : DIN 1420 für H7
- ▶ Schaft-Ø = Nomineller Reibahlen-Ø
- ▶ Geradegenutet / Rechtsschneidend
- ▶ Anschnittwinkel - Konisch
- ▶ Zentrierungsart - bis Ø3,75 mm : Zentrierungszapfen
  - über Ø3,75 mm : Zentrierung

DIN 206-A



Hole type



HSS | DIN 206 | H7 | Bright

$D_1=D_2$

Unit : mm

EDP No.	Reamer Diameter D	Flute Length L_1	Overall Length L_2	No. of Flute
K114300200	2.0	25	50	4
K114300220	2.2	27	54	4
K114300250	2.5	29	58	4
K114300280	2.8	31	62	4
K114300300	3.0	31	62	6
K114300350	3.5	35	71	6
K114300400	4.0	38	76	6
K114300450	4.5	41	81	6
K114300500	5.0	44	87	6
K114300550	5.5	47	93	6
K114300600	6.0	47	93	6
K114300700	7.0	54	107	6
K114300800	8.0	58	115	6
K114300900	9.0	62	124	6
K114301000	10.0	66	133	6
K114301100	11.0	71	142	6
K114301200	12.0	76	152	6
K114301400	14.0	81	163	8
K114301500	15.0	81	163	8
K114301600	16.0	87	175	8
K114301700	17.0	87	175	8
K114301800	18.0	93	188	8
K114301900	19.0	93	188	8
K114302000	20.0	100	201	8
K114302200	22.0	107	215	8
K114302400	24.0	115	231	8

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○				○														

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

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YG REAMERS

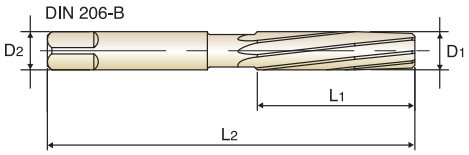
K1153 SERIES

HSS, HAND REAMERS - LH SPIRAL FLUTES

- HSS, HAND REAMERS - LH SPIRAL FLUTES
- ALÉSOIRS HSS À MAIN - HÉLICE À GAUCHE
- ALESATORI A MANO IN HSS - ELICA SINISTRA

- ▶ O.D. Tolerances : DIN 1420, H7
- ▶ Shank Diameter ≒ Nominal Reamer Diameter
- ▶ LH Spiral Flutes / Right Hand Cut
- ▶ Chamfer Angle - tapered
- ▶ Type of center - Up to Ø3.75 : external centers
  - Over Ø3.75 : internal centers

- ▶ Schneiden-Ø Toleranzen : DIN 1420 für H7
- ▶ Schaft-Ø = Nomineller Reibahlen-Ø
- ▶ Spiralgenutet mit Linksdrall / Rechtsschneidend
- ▶ Anschnittwinkel - Konisch
- ▶ Zentrierungsart - bis Ø3,75 mm : Zentrierungszapfen
  - über Ø3,75 mm : Zentrierung



Hole type

HSS | DIN 206 | H7 | LH7° | Bright

$D_1=D_2$

Unit : mm

EDP No.	Reamer Diameter D	Flute Length L_1	Overall Length L_2	No. of Flute
K115300200	2.0	25	50	4
K115300220	2.2	27	54	4
K115300250	2.5	29	58	4
K115300280	2.8	31	62	4
K115300300	3.0	31	62	6
K115300320	3.2	33	66	6
K115300400	4.0	38	76	6
K115300500	5.0	44	87	6
K115300550	5.5	47	93	6
K115300600	6.0	47	93	6
K115300700	7.0	54	107	6
K115301200	12.0	76	152	6
K115301300	13.0	76	152	6
K115301400	14.0	81	163	8
K115301500	15.0	81	163	8
K115301600	16.0	87	175	8
K115301700	17.0	87	175	8
K115301800	18.0	93	188	8
K115301900	19.0	93	188	8
K115302000	20.0	100	201	8
K115302200	22.0	107	215	8
K115302400	24.0	115	231	8

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○				○														

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

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YG REAMERS

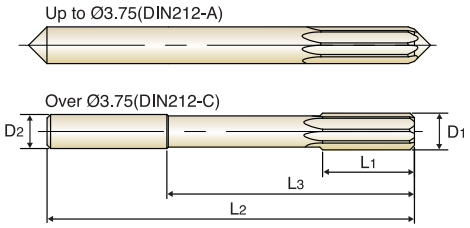
K2101 SERIES

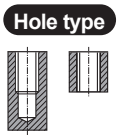
HSS-E, STRAIGHT SHANK CHUCKING REAMERS - STRAIGHT FLUTES

HSS-E, MASCHINENREIBAHLE mit ZYLINDERSCHAFT - GERADEGENUTET
ALÉSOIRS HSS-E MACHINE DROIT- ENTRÉE DROITE
ALESATORI IN HSS-E, ATTACCO CILINDRICO - ELICA DRITTA

- O.D. Tolerances : DIN 1420 for H7
- Shank Diameter Tolerances : h8
- Straight Flute / Right Hand Cut
- Chamfer Angle - Up to Ø3.75 : 15°
  - Over Ø3.75 : 45°

- Schneiden-Ø Toleranzen : DIN 1420 für H7
- Schaft-Ø Toleranzen : h8
- Geradegenutet / Rechtsschneidend
- Anschnittwinkel - bis Ø3,75 mm : 15°
  - über Ø3,75 mm : 45°





HSS-E | DIN 212 | H7 | 15° | 45° | Bright

p.A388

up to Ø3.75 over Ø3.75

Unit : mm

EDP No.	Reamer Diameter D1	Shank Diameter D2	Cutting Length L1	Neck Length L3	Overall Length L2	No. of Flute
K210100220	2.2	2.2	12	-	53	4
K210100250	2.5	2.5	14	-	57	4
K210100260	2.6	2.6	14	-	57	4
K210100280	2.8	2.8	15	-	61	4
K210100300	3.0	3	15	-	61	6
K210100320	3.2	3.2	16	-	65	6
K210100360	3.6	3.6	18	-	70	6
K210100370	3.7	3.7	18	-	70	6
K210100400	4.0	4	19	42	75	6
K210100430	4.3	4.5	21	46	80	6
K210100450	4.5	4.5	21	46	80	6
K210100460	4.6	4.5	21	46	80	6
K210100500	5.0	5	23	51	86	6
K210100550	5.5	5.6	26	56	93	6
K210100560	5.6	5.6	26	56	93	6
K210100600	6.0	5.6	26	56	93	6
K210100650	6.5	6.3	28	62	101	6
K210100700	7.0	7.1	31	68	109	6
K210100720	7.2	7.1	31	68	109	6
K210100800	8.0	8	33	74	117	6
K210100830	8.3	8	33	74	117	6
K210100850	8.5	8	33	74	117	6
K210100900	9.0	9	36	80	125	6

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		◎	○			○		○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

YG REAMERS

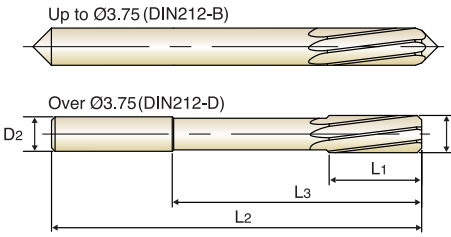
K2111 SERIES

HSS-E, STRAIGHT SHANK CHUCKING REAMERS - LH SPIRAL FLUTES

HSS-E, MASCHINENREIBAHLE mit ZYLINDERSCHAFT - SPIRALGENUTET mit LINKSDRALL
ALÉSOIRS HSS-E MACHINE DROIT- HÉLICE À GAUCHE
ALESATORI IN HSS-E, ATTACCO CILINDRICO - ELICA SINISTRA

- O.D. Tolerances : DIN 1420 for H7
- Shank Diameter Tolerances : h8
- LH Spiral Flutes / Right Hand Cut
- Chamfer Angle - Up to Ø3.75 : 15°
  - Over Ø3.75 : 45°

- Schneiden-Ø Toleranzen : DIN 1420 für H7
- Schaft-Ø Toleranzen : h8
- Spiralgenutet mit Linksdrall / Rechtsschneidend
- Anschnittwinkel - bis Ø3,75 mm : 15°
  - über Ø3,75 mm : 45°



Hole type

HSS-E | DIN 212 | H7 | LH7° | 15° (up to Ø3.75) | 45° (over Ø3.75) | Bright

p.A388

Unit : mm

EDP No.	Reamer Diameter D1	Shank Diameter D2	Cutting Length L1	Neck Length L3	Overall Length L2	No. of Flute
K211100200	2.0	2	11	-	49	4
K211100220	2.2	2.2	12	-	53	4
K211100250	2.5	2.5	14	-	57	4
K211100260	2.6	2.6	14	-	57	4
K211100280	2.8	2.8	15	-	61	4
K211100300	3.0	3	15	-	61	6
K211100310	3.1	3.1	16	-	65	6
K211100320	3.2	3.2	16	-	65	6
K211100350	3.5	3.5	18	-	70	6
K211100360	3.6	3.6	18	-	70	6
K211100400	4.0	4	19	42	75	6
K211100430	4.3	4.5	21	46	80	6
K211100450	4.5	4.5	21	46	80	6
K211100500	5.0	5	23	51	86	6
K211100550	5.5	5.6	26	56	93	6
K211100560	5.6	5.6	26	56	93	6
K211100600	6.0	5.6	26	56	93	6
K211100650	6.5	6.3	28	62	101	6
K211100700	7.0	7.1	31	68	109	6
K211100720	7.2	7.1	31	68	109	6
K211100800	8.0	8	33	74	117	6

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		◎	○			○		○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

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YG REAMERS

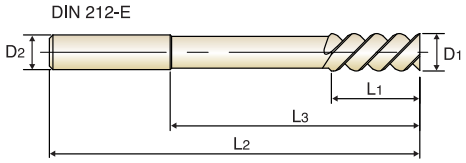
K2121 SERIES

HSS-E, STRAIGHT SHANK CHUCKING REAMERS - LH SPIRAL FLUTES (QUICK SPIRAL)

HSS-E, MASCHINEN - SCHÄLREIBAHLE mit ZYLINDERSCHAFT - SPIRALGENUTET mit LINKSDRAL
ALÉSOIRS HSS-E MACHINE DROIT- HÉLICE À GAUCHE (HÉLICE RAPIDE)
ALESATORI IN HSS-E, ATTACCO CILINDRICO - ELICA RAPIDA, SINISTRA

- ▶ O.D. Tolerances : DIN 1420 for H7
- ▶ Shank Diameter Tolerances : h8
- ▶ Chamfer Angle - tapered
- ▶ LH High Spiral Flutes / Right Hand Cut

- ▶ Schneiden-Ø Toleranzen : DIN 1420 für H7
- ▶ Schaft-Ø Toleranzen : h8
- ▶ Anschnittwinkel - Konisch
- ▶ Spiralgenutet mit Linksdrall / Rechtsschneidend



Hole type

HSS-E | DIN 212 | H7 | LH45° | FORM E | Bright

p.A388

Unit : mm

EDP No.	Reamer Diameter D1	Shank Diameter D2	Cutting Length L1	Neck Length L3	Overall Length L2	No. of Flute
K212100400	4.0	4	19	42	75	3
K212100450	4.5	4.5	21	46	80	3
K212100500	5.0	5	23	51	86	3
K212100550	5.5	5.6	26	56	93	3
K212100650	6.5	6.3	28	62	101	3
K212100900	9.0	9	36	80	125	3
K212100950	9.5	9	36	80	125	3
K212101000	10.0	10	38	86	133	3
K212101100	11.0	10	41	95	142	3
K212101200	12.0	10	44	104	151	3
K212101400	14.0	12.5	47	108	160	4
K212101500	15.0	12.5	50	110	162	4
K212101600	16.0	12.5	52	118	170	4
K212101700	17.0	14	54	121	175	4
K212101800	18.0	14	56	128	182	4
K212101900	19.0	16	58	129	189	4

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○				○														

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎		◎	◎	◎													

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REAMERS

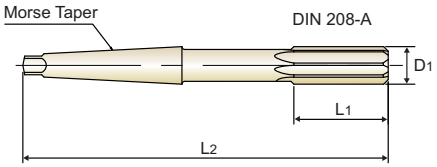
K2102 SERIES

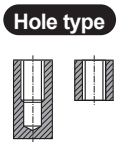
HSS-E, MORSE TAPER SHANK CHUCKING REAMERS - STRAIGHT FLUTES

HSS-E, MASCHINENREIBAHLE mit MK - GERADEGENUTET
ALÉSOIRS HSS-E MACHINE QUEUE CONIQUE - ENTRÉE DROITE
ALESATORI IN HSS-E, ATTACCO CONICO - TAGLIENTI DRITTI

- O.D. Tolerances : DIN 1420 for H7
- Straight Flute / Right Hand Cut
- Chamfer Angle : 45°

- Schneiden-Ø Toleranzen : DIN 1420 für H7
- Geradegenutet / Rechtsschneidend
- Anschnittwinkel : 45°





HSS-E | DIN 208 | H7 | 45° | FORM A | Bright

p.A388

Unit : mm

EDP No.	Reamer Diameter D1	No. of Morse Taper	Cutting Length L1	Overall Length L2	No. of Flute
K210204000	40.0	4	81	329	10
K210204100	41.0	4	82	333	12
K210204200	42.0	4	82	333	12
K210204300	43.0	4	83	336	12
K210204400	44.0	4	83	336	12
K210204500	45.0	4	83	336	12
K210204600	46.0	4	84	340	12
K210204700	47.0	4	84	340	12
K210204800	48.0	4	86	344	12
K210205000	50.0	4	86	344	12

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		◎	○			○		○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

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YG REAMERS

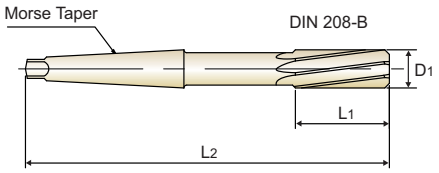
K2112 SERIES

HSS-E, MORSE TAPER SHANK CHUCKING REAMERS - LH SPIRAL FLUTES

HSS-E, MASCHINENREIBAHLE mit MK - SPIRALGENUTET mit LINKSDRALL
ALÉSOIRS HSS-E MACHINE QUEUE CONIQUE - HÉLICE À GAUCHE
ALESATORI IN HSS-E, ATTACCO CONICO - ELICA SINISTRA

- O.D. Tolerances : DIN 1420 for H7
- LH Spiral Flutes / Right Hand Cut
- Chamfer Angle : 45°

- Schneiden-Ø Toleranzen : DIN 1420 für H7
- Spiralgenutet mit Linksdrall / Rechtsschneidend
- Anschnittwinkel : 45°



HSS-E | DIN 208 | H7 | LH7° | 45° | FORM B | Bright

p.A388

Unit : mm

EDP No.	Reamer Diameter D1	No. of Morse Taper	Cutting Length L1	Overall Length L2	No. of Flute
K211203800	38.0	4	81	329	10
K211204000	40.0	4	81	329	10
K211204100	41.0	4	82	333	12
K211204200	42.0	4	82	333	12
K211204300	43.0	4	83	336	12
K211204600	46.0	4	84	340	12
K211204700	47.0	4	84	340	12
K211204800	48.0	4	86	344	12

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		◎	○			○		○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

REAMERS

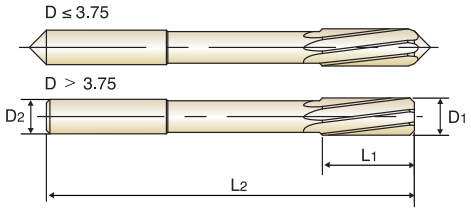
K21B1 SERIES

HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø

HSS-E, NC-MASCHINENREIBAHLEN mit GERADZAHLIGEN SCHAFT Ø
ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE
ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI

▶ O.D. Tolerances
Whole-number Ø and 1/10 size : DIN 1420 for H7
1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm
from Ø5.97 to Ø12.03 : +0.005/-0.000mm
▶ Shank Diameter Tolerances : h6
▶ LH Spiral Flutes / Right Hand Cut
▶ Chamfer Angle - Up to Ø3.75 : 15°
- Over Ø3.75 : 45°

▶ Ø Toleranzen:
ganzzahlige Ø und 1/10 Größen : DIN 1420 für H7
1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm
von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
▶ Schaft-Durchmesser Toleranzen : h6
▶ linksspiralig/ rechtsscheidend
▶ Anschnittwinkel - bis Ø3,75 : 15°
- über Ø3,75 : 45°



Hole type

HSS-E | H7 | LH7° | 15° | 45° | Bright

up to Ø3.75 over Ø3.75

p.A388

Unit : mm

EDP No.	Reamer Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
K21B100302	3.02	4	16	65
K21B100303	3.03	4	16	65
K21B100310	3.1	4	16	65
K21B100320	3.2	4	16	65
K21B100330	3.3	4	16	65
K21B100340	3.4	4	18	70
K21B100350	3.5	4	18	70
K21B100360	3.6	4	18	70
K21B100370	3.7	4	18	70
K21B100380	3.8	4	19	75
K21B100390	3.9	4	19	75
K21B100397	3.97	4	19	75
K21B100398	3.98	4	19	75
K21B100399	3.99	4	19	75
K21B100400	4.0	4	19	75
K21B100401	4.01	4	19	75
K21B100402	4.02	4	19	75
K21B100403	4.03	4	19	75
K21B100410	4.1	4	19	75
K21B100420	4.2	4	19	75
K21B100430	4.3	5	21	80
K21B100440	4.4	5	21	80
K21B100450	4.5	5	21	80
K21B100460	4.6	5	21	80

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		◎	○			○		○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

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REAMERS

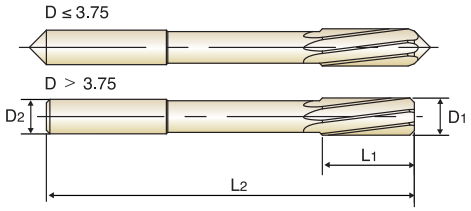
K21B1 SERIES

HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø

HSS-E, NC-MASCHINENREIBAHLEN mit GERADZAHLIGEN SCHAFT Ø
ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE
ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI

▶ O.D. Tolerances
Whole-number Ø and 1/10 size : DIN 1420 for H7
1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm
from Ø5.97 to Ø12.03 : +0.005/-0.000mm
▶ Shank Diameter Tolerances : h6
▶ LH Spiral Flutes / Right Hand Cut
▶ Chamfer Angle - Up to Ø3.75 : 15°
- Over Ø3.75 : 45°

▶ Ø Toleranzen:
ganzzahlige Ø und 1/10 Größen : DIN 1420 für H7
1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm
von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
▶ Schaft-Durchmesser Toleranzen : h6
▶ linksspiralig/ rechtsscheidend
▶ Anschnittwinkel - bis Ø3,75 : 15°
- über Ø3,75 : 45°



Hole type

HSS-E | H7 | LH7° | 15° | 45° | Bright

p.A388

up to Ø3.75 over Ø3.75

Unit : mm

EDP No.	Reamer Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
K21B100620	6.2	6	28	101
K21B100630	6.3	6	28	101
K21B100640	6.4	6	28	101
K21B100660	6.6	6	28	101
K21B100670	6.7	6	28	101
K21B100680	6.8	8	31	109
K21B100700	7.0	8	31	109
K21B100710	7.1	8	31	109
K21B100720	7.2	8	31	109
K21B100730	7.3	8	31	109
K21B100740	7.4	8	31	109
K21B100750	7.5	8	31	109
K21B100770	7.7	8	33	117
K21B100780	7.8	8	33	117
K21B100790	7.9	8	33	117
K21B100797	7.97	8	33	117
K21B100798	7.98	8	33	117
K21B100799	7.99	8	33	117
K21B100800	8.0	8	33	117
K21B100801	8.01	8	33	117
K21B100802	8.02	8	33	117
K21B100803	8.03	8	33	117
K21B100810	8.1	8	33	117
K21B100820	8.2	8	33	117

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		◎	○			○		○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG REAMERS

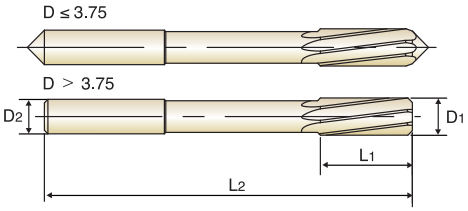
K21B1 SERIES

HSS-E, NC MACHINE REAMERS WITH WHOLE-NUMBER SHANK Ø

HSS-E, NC-MASCHINENREIBAHLEN mit GERADZAHLIGEN SCHAFT Ø
ALÉSOIRS HSS-E MACHINE CN AVEC DIFFÉRENTES TOLÉRANCES DE QUEUE
ALESATORI A MACCHINA IN HSS-E CON GAMMA Ø NOMINALI

- O.D. Tolerances
  Whole-number Ø and 1/10 size : DIN 1420 for H7
  1/100 size : from Ø2.01 to Ø5.03 : +0.004/-0.000mm
  from Ø5.97 to Ø12.03 : +0.005/-0.000mm
- Shank Diameter Tolerances : h6
- LH Spiral Flutes / Right Hand Cut
- Chamfer Angle - Up to Ø3.75 : 15°
  - Over Ø3.75 : 45°

- Ø Toleranzen:
  ganzzahlige Ø und 1/10 Größen : DIN 1420 für H7
  1/100 Größen : ab Ø2,01 bis Ø5,03 : +0.004/-0.000mm
  von Ø5,97 bis Ø12,03 : +0.005/-0.000mm
- Schaft-Durchmesser Toleranzen : h6
- linksspiralig/ rechtsscheidend
- Anschnittwinkel - bis Ø3,75 : 15°
  - über Ø3,75 : 45°



Hole type

HSS-E | H7 | LH7° | 15° | 45° | Bright

up to Ø3.75 over Ø3.75

p.A388

Unit : mm

EDP No.	Reamer Diameter D1	Shank Diameter D2	Flute Length L1	Overall Length L2
K21B101200	12.0	10	44	151
K21B101201	12.01	10	44	151
K21B101202	12.02	10	44	151
K21B101203	12.03	10	44	151
K21B101300	13.0	10	44	151
K21B101400	14.0	14	47	160
K21B101500	15.0	14	50	162
K21B101600	16.0	14	52	170
K21B101700	17.0	14	54	175
K21B101800	18.0	14	56	182
K21B101900	19.0	16	58	189
K21B102000	20.0	16	60	195

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		◎	○			○		○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○		○	○	○													

YG REAMERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

K2101, K2111, K21B1, K2102, K2112 SERIES

HSS-E, STRAIGHT & LH SPIRAL FLUTE CHUCKING REAMERS
HSS-E, NC MACHINE REAMERS

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Feed														
				2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0	45.0	50.0
P	1	Non-alloy steel	14	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.14	0.14-0.17	0.17-0.20	0.20-0.23	0.23-0.26	0.26-0.29	0.29-0.32	0.32-0.35	0.35-0.38	0.38-0.41	0.41-0.44	0.44-0.47	0.47-0.50
	2		14	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.14	0.14-0.17	0.17-0.20	0.20-0.23	0.23-0.26	0.26-0.29	0.29-0.32	0.32-0.35	0.35-0.38	0.38-0.41	0.41-0.44	0.44-0.47	0.47-0.50
	3		10	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.13	0.13-0.15	0.15-0.17	0.17-0.19	0.19-0.21	0.21-0.23	0.23-0.25	0.25-0.27	0.27-0.29	0.29-0.31	0.31-0.34	0.34-0.37	0.37-0.40
	4		8	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.13	0.13-0.15	0.15-0.17	0.17-0.19	0.19-0.21	0.21-0.23	0.23-0.25	0.25-0.27	0.27-0.29	0.29-0.31	0.31-0.34	0.34-0.37	0.37-0.40
	6	Low alloy steel	12	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.13	0.13-0.15	0.15-0.17	0.17-0.19	0.19-0.21	0.21-0.23	0.23-0.25	0.25-0.27	0.27-0.29	0.29-0.31	0.31-0.34	0.34-0.37	0.37-0.40
	7		8	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.13	0.13-0.15	0.15-0.17	0.17-0.19	0.19-0.21	0.21-0.23	0.23-0.25	0.25-0.27	0.27-0.29	0.29-0.31	0.31-0.34	0.34-0.37	0.37-0.40
	10	High alloyed steel, and tool steel	6	0.03-0.04	0.04-0.05	0.05-0.06	0.06-0.07	0.07-0.08	0.08-0.10	0.10-0.12	0.12-0.14	0.14-0.16	0.16-0.18	0.18-0.20	0.20-0.22	0.22-0.24	0.24-0.26	0.26-0.28	0.28-0.30
M	12	Stainless steel	6	0.03-0.04	0.04-0.05	0.05-0.0.6	0.06-0.07	0.07-0.08	0.08-0.10	0.10-0.12	0.12-0.14	0.14-0.16	0.16-0.18	0.18-0.20	0.20-0.22	0.22-0.24	0.24-0.26	0.26-0.28	0.28-0.30
	13		5	0.03-0.04	0.04-0.05	0.05-0.06	0.06-0.07	0.07-0.08	0.08-0.10	0.10-0.12	0.12-0.14	0.14-0.16	0.16-0.18	0.18-0.20	0.20-0.22	0.22-0.24	0.24-0.26	0.26-0.28	0.28-0.30
	14		4	0.03-0.04	0.04-0.05	0.05-0.06	0.06-0.07	0.07-0.08	0.08-0.10	0.10-0.12	0.12-0.14	0.14-0.16	0.16-0.18	0.18-0.20	0.20-0.22	0.22-0.24	0.24-0.26	0.26-0.28	0.28-0.30
K	15	Grey cast iron	14	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.14	0.14-0.17	0.17-0.20	0.20-0.23	0.23-0.26	0.26-0.29	0.29-0.32	0.32-0.35	0.35-0.38	0.38-0.41	0.41-0.44	0.44-0.47	0.47-0.50
	16		11	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.13	0.13-0.15	0.15-0.17	0.17-0.19	0.19-0.21	0.21-0.23	0.23-0.25	0.25-0.27	0.27-0.29	0.29-0.31	0.31-0.34	0.34-0.37	0.37-0.40
	17	Nodular cast iron	12	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.14	0.14-0.17	0.17-0.20	0.20-0.23	0.23-0.26	0.26-0.29	0.29-0.32	0.32-0.35	0.35-0.38	0.38-0.41	0.41-0.44	0.44-0.47	0.47-0.50
	18		10	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.13	0.13-0.15	0.15-0.17	0.17-0.19	0.19-0.21	0.21-0.23	0.23-0.25	0.25-0.27	0.27-0.29	0.29-0.31	0.31-0.34	0.34-0.37	0.37-0.40
	19	Malleable cast iron	12	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.14	0.14-0.17	0.17-0.20	0.20-0.23	0.23-0.26	0.26-0.29	0.29-0.32	0.32-0.35	0.35-0.38	0.38-0.41	0.41-0.44	0.44-0.47	0.47-0.50
	20		10	0.05-0.07	0.07-0.09	0.09-0.11	0.11-0.13	0.13-0.15	0.15-0.17	0.17-0.19	0.19-0.21	0.21-0.23	0.23-0.25	0.25-0.27	0.27-0.29	0.29-0.31	0.31-0.34	0.34-0.37	0.37-0.40
N	21	Aluminum-wrought alloy	18	0.10-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.31	0.31-0.34	0.34-0.37	0.37-0.40	0.40-0.43	0.43-0.46	0.46-0.49	0.49-0.52	0.52-0.56	0.56-0.60
	22		18	0.10-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.31	0.31-0.34	0.34-0.37	0.37-0.40	0.40-0.43	0.43-0.46	0.46-0.49	0.49-0.52	0.52-0.56	0.56-0.60
	23	Aluminum-cast, alloyed	18	0.10-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.31	0.31-0.34	0.34-0.37	0.37-0.40	0.40-0.43	0.43-0.46	0.46-0.49	0.49-0.52	0.52-0.56	0.56-0.60
	24		17	0.10-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.31	0.31-0.34	0.34-0.37	0.37-0.40	0.40-0.43	0.43-0.46	0.46-0.49	0.49-0.52	0.52-0.56	0.56-0.60
	26	Copper and Copper Alloys (Bronze / Brass)	18	0.10-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.31	0.31-0.34	0.34-0.37	0.37-0.40	0.40-0.43	0.43-0.46	0.46-0.49	0.49-0.52	0.52-0.56	0.56-0.60
	27		16	0.10-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.31	0.31-0.34	0.34-0.37	0.37-0.40	0.40-0.43	0.43-0.46	0.46-0.49	0.49-0.52	0.52-0.56	0.56-0.60
	28		20	0.10-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.31	0.31-0.34	0.34-0.37	0.37-0.40	0.40-0.43	0.43-0.46	0.46-0.49	0.49-0.52	0.52-0.56	0.56-0.60

K2121 SERIES

HSS-E, CHUCKING REAMERS - QUICK SPIRAL

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Feed							
				2.0	4.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1	Non-alloy steel	18	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.32	0.32-0.36	0.36-0.40
	2		16	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.32	0.32-0.36	0.36-0.40
	6	Low alloy steel	14	0.10-0.12	0.12-0.14	0.14-0.16	0.16-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.30
N	21	Aluminum-wrought alloy	20	0.15-0.20	0.20-0.25	0.25-0.30	0.30-0.36	0.36-0.42	0.42-0.48	0.48-0.54	0.54-0.60
	22		20	0.15-0.20	0.20-0.25	0.25-0.30	0.30-0.36	0.36-0.42	0.42-0.48	0.48-0.54	0.54-0.60
	23	Aluminum-cast, alloyed	20	0.15-0.20	0.20-0.25	0.25-0.30	0.30-0.36	0.36-0.42	0.42-0.48	0.48-0.54	0.54-0.60
	24		18	0.15-0.20	0.20-0.25	0.25-0.30	0.30-0.36	0.36-0.42	0.42-0.48	0.48-0.54	0.54-0.60
	26	Copper and Copper Alloys (Bronze / Brass)	19	0.15-0.20	0.20-0.25	0.25-0.30	0.30-0.36	0.36-0.42	0.42-0.48	0.48-0.54	0.54-0.60
	27		18	0.15-0.20	0.20-0.25	0.25-0.30	0.30-0.36	0.36-0.42	0.42-0.48	0.48-0.54	0.54-0.60
	28		20	0.15-0.20	0.20-0.25	0.25-0.30	0.30-0.36	0.36-0.42	0.42-0.48	0.48-0.54	0.54-0.60

SELECTION GUIDE

YG HOLEMAKING TOOLS

SERIES	C1109 C3109	C1119 C3119
STANDARD	STANDARD	STANDARD
POINT ANGLE	90°	90°
SIZE MIN	D10.0	D10.0
SIZE MAX	D50.0	D50.0
PAGE	A392	A393
SURFACE TREATMENT	Bright	

HSS & HSS Co8
COUNTERSINKS

For Deburring, Chamfering and Countersinking

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A397

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○
	2		About 0.45% C	Annealed	190	13	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	○	○
	4		About 0.75% C	Annealed	270	28	○	○
	5		About 0.75% C	Quenched & Tempered	300	32	○	○
	6	Low alloy steel		Annealed	180	10		
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○
	14		Austenitic		180	10	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○
	16		Pearlitic (Martensitic)		260	26	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○
	18		Pearlitic		250	25	○	○
	19	Malleable cast iron	Ferritic		130		○	○
	20		Pearlitic		230	21	○	○
N	21	Aluminum-wrought alloy	Not Curable		60		○	○
	22		Curable	Hardened	100		○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○
	25		> 12% Si, Not Curable		130		○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○
	27		CuZn, CuSnZn (Brass)		90		○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

COUNTERSINKS

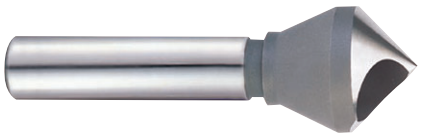
C1109 SERIES
C3109 SERIES

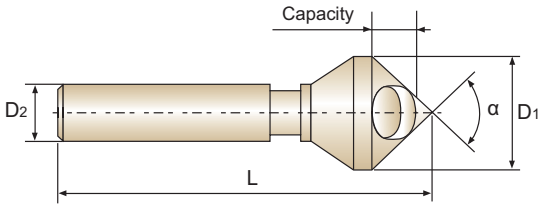
HSS & HSS Co8, DEBURRING TOOL with HOLE

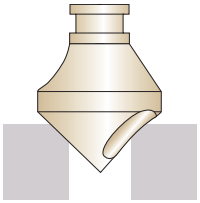
HSS, QUERLOCHSENKER
FRAISE HSS À ÉBAVURER À TROU
SVASATORI CON FORO - HSS

- For light metals and plastics.
- For deburring and small chamfers.
- Best surface finish.
- Works without vibrations.

- Für Leichtmetall und Plastik
- Zum Entgraten und Abfasen
- Bestes Oberflächenfinish
- Arbeitet ohne Vibration







YG STD | HSS | HSS Co8 | Bright

p.A397

Unit : mm

EDP No. (uncoating)		Point Angle	Cutter Diameter	Shank Diameter	Overall Length	Capacity
HSS Co8	HSS	α	D1	D2	L(±1)	min/max
C1109100	**C3109100**	90°	**10.0**	6	45	2 - 5
C1109150	**C3109150**	90°	**15.0**	8	55	6 - 14
C1109200	**C3109200**	90°	**20.0**	10	65	8 - 18
C1109250	**C3109250**	90°	**25.0**	12	78	10 - 23
C1109300	**C3109300**	90°	**30.0**	12	88	12 - 28
C1109350	**C3109350**	90°	**35.0**	16	110	14 - 33
C1109400	**C3109400**	90°	**40.0**	16	115	16 - 38
C1109450	**C3109450**	90°	**45.0**	16	120	18 - 43
C1109500		90°	**50.0**	16	130	20 - 48

▶ TiN & TiCN coating are available on your request.

Cutter Dia. Tolerance(mm)	Shank Dia. Tolerance(mm)	Point Angle Tolerance(°)
+0.3/−0	h9	+0/−1

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○							○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COUNTERSINKS

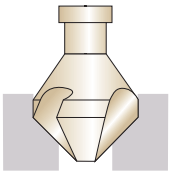
C1136 SERIES
C3136 SERIES

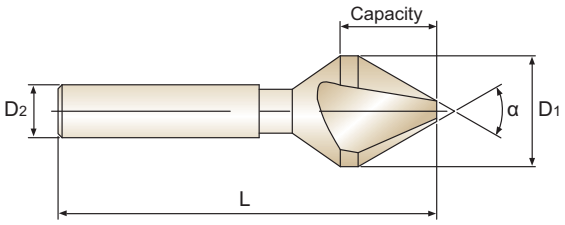
HSS & HSS Co8, THREE FLUTE COUNTERSINKS (60°)

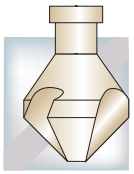
HSS, DREISCHNEIDEN KEGELSENKER (60°)
FRAISE HSS À CHANFREINER 3 DENTS (60°)
SVASATORI A TRE TAGLIENTI - HSS (60°)

- Self-centering(3 flutes)
- For deburring, chamfering and countersinking
- Hand using
- Longitudinal chamfers and contouring
- Works without vibrations

- Selbstzentrierend
- Besonders geeignet zum 90° Ansenken für Senkkopfschrauben
- Manueller Einsatz möglich
- Zum Entgraten von Längs- und Profilkanten
- Arbeitet ohne Vibration







DIN 334 C | HSS | HSS Co8 | Bright

p.A397

Unit : mm

EDP No. (uncoating)		Point Angle	Cutter Diameter	Shank Diameter	Overall Length	Capacity
HSS Co8	HSS	α	D1	D2	L(±1)	min/max
C1136063		60°	**6.3**	5	45	1.6~6.3
C1136080		60°	**8.0**	6	50	2.0~8.0
C1136100		60°	**10.0**	6	50	2.5~10.0
C1136125		60°	**12.5**	8	56	3.2~12.5
C1136160	**C3136160**	60°	**16.0**	10	63	4.0~16.0
C1136200	**C3136200**	60°	**20.0**	10	67	5.0~20.0
C1136250	**C3136250**	60°	**25.0**	10	71	6.3~25.0

▶ TiN & TiCN coating are available on your request.

Cutter Dia. Tolerance(mm)	Shank Dia. Tolerance(mm)	Point Angle Tolerance(°)
±0.05	h9	+0/−1

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○							○	○	○	◎	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	○	○	○	○	○	○	○													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COUNTERSINKS

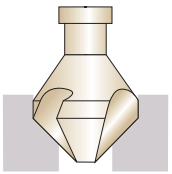
C1132 SERIES
C3132 SERIES

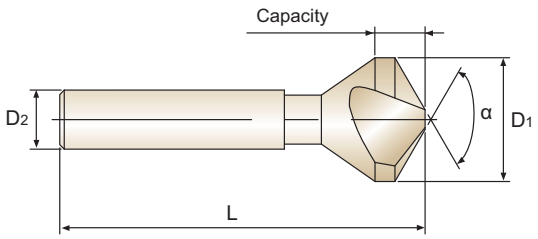
HSS & HSS Co8, THREE FLUTE COUNTERSINKS (120°)

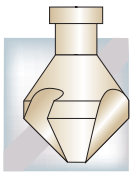
HSS, DREISCHNEIDEN KEGELSENKER (120°)
FRAISE HSS À CHANFREINER 3 DENTS (120°)
SVASATORI A TRE TAGLIENTI - HSS (120°)

- Self-centering(3 flutes)
- For deburring, chamfering and countersinking
- Hand using
- Longitudinal chamfers and contouring
- Works without vibrations

- Selbstzentrierend
- Zum Entgraten, Abfasen und Senkkopfschrauben
- Manueller Einsatz möglich
- Zum Entgraten von Längs- und Profilkanten
- Arbeitet ohne Vibration







YG STD | HSS | HSS Co8 | Bright

p.A398

Unit : mm

EDP No. (uncoating)		Point Angle	Cutter Diameter	Shank Diameter	Overall Length	Capacity
HSS Co8	HSS	α	D1	D2	L(±1)	min/max
C1132080	**C3132080**	120°	**8.0**	6	49	2.0~8.0
C1132160		120°	**16.0**	10	57	3.2~16.0
C1132200	**C3132200**	120°	**20.0**	10	59	3.5~20.0
C1132250		120°	**25.0**	10	65	3.8~25.0

▶ TiN & TiCN coating are available on your request.

Cutter Dia. Tolerance(mm)	Shank Dia. Tolerance(mm)	Point Angle Tolerance(°)
±0.05	h9	+0/−1

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○							○	○	○	◎	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	○	○	○	○	○	○	○													

COUNTERSINKS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

C1136, C3136, C1139, C3139, C1132, C3132 SERIES

3 FLUTE COUNTERSINKS

Vc = m/min.
RPM = rev./min.
FEED = mm/rev.

ISO	VDI 3323	Material Description	Vc	Feed							
				5.0	10.0	15.0	20.0	25.0	30.0	40.0	50.0
P	1	Non-alloy steel	20	0.12-0.16	0.16-0.20	0.20-0.23	0.23-0.26	0.26-0.29	0.29-0.33	0.33-0.37	0.37-0.41
	2		20	0.12-0.16	0.16-0.20	0.20-0.23	0.23-0.26	0.26-0.29	0.29-0.33	0.33-0.37	0.37-0.41
	3		13	0.10-0.14	0.14-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.31	0.31-0.35	0.35-0.39
	4		10	0.06-0.10	0.10-0.14	0.14-0.17	0.17-0.21	0.21-0.24	0.24-0.27	0.27-0.31	0.31-0.35
	5		10	0.06-0.10	0.10-0.14	0.14-0.17	0.17-0.21	0.21-0.24	0.24-0.27	0.27-0.31	0.31-0.35
M	12	Stainless steel	6	0.06-0.08	0.06-0.08	0.08-0.10	0.08-0.10	0.10-0.12	0.10-0.12	0.12-0.15	0.12-0.15
	13		5	0.06-0.08	0.06-0.08	0.08-0.10	0.08-0.10	0.10-0.12	0.10-0.12	0.12-0.15	0.12-0.15
	14		4	0.06-0.08	0.06-0.08	0.08-0.10	0.08-0.10	0.10-0.12	0.10-0.12	0.12-0.15	0.12-0.15
K	15	Grey cast iron	22	0.09-0.11	0.11-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.32
	16		17	0.08-0.10	0.10-0.12	0.12-0.15	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.31
	17	Nodular cast iron	17	0.09-0.11	0.11-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.32
	18		15	0.08-0.10	0.10-0.12	0.12-0.15	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.31
	19	Malleable cast iron	17	0.09-0.11	0.11-0.13	0.13-0.16	0.16-0.19	0.19-0.22	0.22-0.25	0.25-0.28	0.28-0.32
	20		15	0.08-0.10	0.10-0.12	0.12-0.15	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.31
N	21	Aluminum-wrought alloy	42	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.31	0.31-0.35	0.35-0.40	0.40-0.45
	22		42	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.31	0.31-0.35	0.35-0.40	0.40-0.45
	23	Aluminum-cast, alloyed	39	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.31	0.31-0.35	0.35-0.40	0.40-0.45
	24		37	0.12-0.15	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.28	0.28-0.32	0.32-0.37	0.37-0.42
	25		35	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.27	0.27-0.31	0.31-0.35	0.35-0.40	0.40-0.45
	26	Copper and Copper Alloys (Bronze / Brass)	28	0.12-0.15	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.28	0.28-0.32	0.32-0.37	0.37-0.42
	27		25	0.12-0.15	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.28	0.28-0.32	0.32-0.37	0.37-0.42
	28		15	0.12-0.15	0.15-0.18	0.18-0.21	0.21-0.24	0.24-0.28	0.28-0.32	0.32-0.37	0.37-0.42

SERIES	EL950		
TYPE	MEDIUM	FINE	BEOFRE THREADING
PILOT DIA.	3.4~14.0	3.2~13.0	2.5~10.2
CUTTER DIA.	6.0~20.0		
PAGE	A401		
SURFACE TREATMENT	Bright		

HSS-E
COUNTERBORES

For Machining Screw Head Seats

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.A403

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎
	2		About 0.45% C	Annealed	190	13	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎
	4		About 0.75% C	Annealed	270	28	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎
	6	Low alloy steel		Annealed	180	10	◎
	7			Quenched & Tempered	275	29	◎
	8			Quenched & Tempered	300	32	◎
	9			Quenched & Tempered	350	38	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎
	11			Quenched & Tempered	325	35	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	
	13		Martensitic	Quenched & Tempered	240	23	
	14		Austenitic		180	10	
K	15	Grey cast iron	Pearlitic / ferritic		180	10	
	16		Pearlitic (Martensitic)		260	26	
	17	Nodular cast iron	Ferritic		160	3	
	18		Pearlitic		250	25	
	19	Malleable cast iron	Ferritic		130		
	20		Pearlitic		230	21	
N	21	Aluminum-wrought alloy	Not Curable		60		○
	22		Curable	Hardened	100		○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○
	24		≤ 12% Si, Curable	Hardened	90		○
	25		> 12% Si, Not Curable		130		
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		
	27		CuZn, CuSnZn (Brass)		90		
	28		CuSn, lead-free copper and electrolytic copper		100		
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				
	30		Rubber, Wood, etc.				
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	
	32			Cured	280	30	
	33		Ni or Co Based	Annealed	250	25	
	34			Cured	350	38	
	35			Cast	320	34	
	36	Titanium Alloys	Pure Titanium		400 Rm		
	37		Alpha + Beta Alloys	Hardened	1050 Rm		
H	38	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

COUNTERBORES

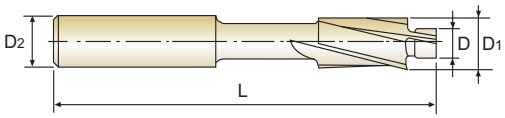
EL950 SERIES

HSS-E, 3 FLUTE COUNTERBORES for 180° CAPSCREW

HSS-E, 3 SCHNEIDEN FLACHSENKER MIT FESTEM FÜHRUNGSZAPFEN
FRAISES À LAMER HSS-E 3 DENTS TÊTE DE VIS À 180°
LAMATORI A TRE TAGLIENTI IN HSS-E per sedi di viti a testa cilindrica a 180°

▶ The counterbores with solid pilot are designed for machining as fillister screw caps or ejector caps in molds.

▶ Die Flachsenker mit festem Führungszapfen dienen dem 180° Ansenken für Zylinderkopfschrauben und Auswerferstiften in Formen



HSS-E | DIN 373 | 3 | PLAIN | Bright p.A403

BEFORE THREADING

Unit : mm

EDP No.	ITEM No.	Screw Size	Pilot Diameter	Cutter Diameter	Shank Diameter	Overall Length
PLAIN	PLAIN		D(e8)	D1(z9)	D2(h9)	L
EL950911	**YG54M4-T**	M4	**3.3**	**8.0**	5	71
EL950912	**YG54M5-T**	M5	**4.2**	**10.0**	8	80
EL950914	**YG54M8-T**	M8	**6.8**	**15.0**	12.5	100
EL950915	**YG54M10-T**	M10	**8.5**	**18.0**	12.5	100
EL950916	**YG54M12-T**	M12	**10.2**	**20.0**	12.5	100

Tolerances according to DIN 7160 & 7161
Toleranzen nach DIN 7160 & 7161

Nominal-Diameter in mm / Nennmaßbereich in mm				
	from 1 to 3 von 1 bis 3	over 3 to 6 über 3 bis 6	over 6 to 10 über 6 bis 10	over 10 to 18 über 10 bis 18
Tolerance range in µm / Toleranzwerte in µm				
e8	- 14 / - 28	- 20 / - 38	- 25 / - 47	- 32 / - 59
h9	0 / - 25	0 / - 30	0 / - 36	0 / - 43

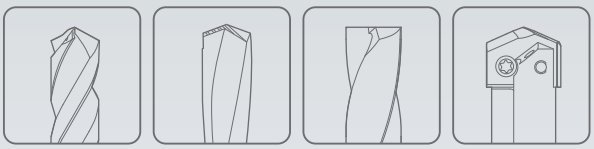
Nominal-Diameter in mm / Nennmaßbereich in mm				
	from 6 to 10 von 6 bis 10	over 10 to 14 über 10 bis 14	over 14 to 18 über 14 bis 18	over 18 to 24 über 18 bis 24
Tolerance range in µm / Toleranzwerte in µm				
z9	+ 78 / + 42	+ 93 / + 50	+ 103 / + 60	+ 125 / + 73

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	○	○																	

Global Cutting Tool Leader **YG-1**



HOLEMAKING

YG CUTTING TOOLS

THREADING TOOLS

SOLID CARBIDE THREAD MILL (with & without Coolant Holes)
HSS-PM SYNCHRO TAP (Spiral Flute, Spiral Point, Straight Flute & Cold Forming)
HSS-PM PRIME TAP (Spiral Flute & Spiral Point)
HSS-E & HSS-PM COMBO TAP (Spiral Flute & Spiral Point)
HSS-E & HSS-PM YG TAP STEEL
HSS-E YG TAP CHIP BREAKER
HSS-E & HSS-PM YG TAP INOX
SOLID CARBIDE & HSS-E YG TAP CAST IRON
SOLID CARBIDE & HSS-E YG TAP HARDENED
HSS-PM YG TAP Ti Ni
HSS-E YG TAP ALU
HSS-E & HSS-PM YG TAP FORMING
HSS & HSS-E YG TAP GENERAL
HSS & HSS-E PIPE TAP
HSS-E SCREW THREAD INSERT TAP
HSS-E NUT TAP

YG-1 CO., LTD.

CONTENTS

SOLID CARBIDE THREAD MILL

HSS-PM & HSS-E MACHINE TAP

HSS MACHINE TAP

SOLID CARBIDE & HSS MACHINE TAP

HSS MACHINE TAP

HSS MACHINE & HAND TAP

HSS PIPE TAP

HSS MACHINE TAP

YG-1 CO., LTD.

SELECTION GUIDE

YG THREADING TOOLS

THREAD MILL

TYPE	Thread Mill without Coolant Hole				Thread Mill with Coolant Hole		
THREAD FORM	M	MF	UNC	UNF	M	MF	BSP(G)
HOLE TYPE	Max. 2.0xD Blind /Through Hole	Max. 1.5xD Blind /Through Hole	Max. 2.0xD Blind /Through Hole	Max. 2.0xD Blind /Through Hole	Max. 2.0xD Blind /Through Hole	Max. 1.5xD Blind /Through Hole	Blind /Through Hole
TOOL MATERIAL	CARBIDE						
FLUTE TYPE	Helix						
HELIX ANGLE	R15						
SERIES NO.	L1211 (p.B36)	L1212 (p.B37)	L1213 (p.B38)	L1214 (p.B39)	L4211 (p.B40)	L4212 (p.B41)	L6215 (p.B42)
SURFACE TREATMENT	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
MODEL							

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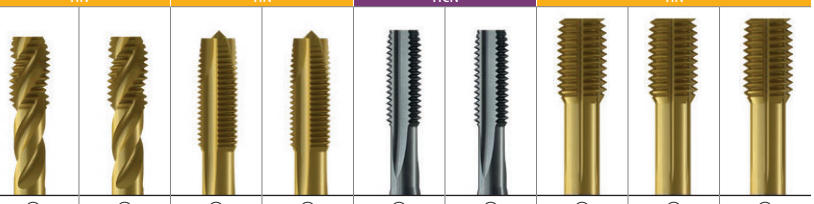
ISO	VDI 3323	Material Description	HB	HRc	L1211	L1212	L1213	L1214	L4211	L4212	L6215
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎
	11		325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	○	○	○	○	○	○	○
	13		240	23	○	○	○	○	○	○	○
	14		180	10	○	○	○	○	○	○	○
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎	◎
	16		260	26	◎	◎	◎	◎	◎	◎	◎
	17	Nodular Cast Iron	160	3	◎	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130		◎	◎	◎	◎	◎	◎	◎
	20		230	21	◎	◎	◎	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	60		◎	◎	◎	◎	◎	◎	◎
	22		100		◎	◎	◎	◎	◎	◎	◎
	23	Aluminum-cast, alloyed	75		◎	◎	◎	◎	◎	◎	◎
	24		90		◎	◎	◎	◎	◎	◎	◎
	25		130		◎	◎	◎	◎	◎	◎	◎
	26	Copper and Copper Alloys (Bronze / Brass)	110		◎	◎	◎	◎	◎	◎	◎
	27		90		◎	◎	◎	◎	◎	◎	◎
	28		100		◎	◎	◎	◎	◎	◎	◎
	29	Non Metallic Materials			◎	◎	◎	◎	◎	◎	◎
	30				◎	◎	◎	◎	◎	◎	◎
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○	○	○	○
	32		280	30	○	○	○	○	○	○	○
	33		250	25	○	○	○	○	○	○	○
	34		350	38	○	○	○	○	○	○	○
	35		320	34	○	○	○	○	○	○	○
	36	Titanium Alloys	400 Rm		○	○	○	○	○	○	○
	37		1050 Rm		○	○	○	○	○	○	○
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42							
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

YG THREADING TOOLS

SYNCHRO TAP

HOLE TYPE			Max. 2.5xD Blind Hole		Max. 3.0xD Through Hole		Max. 2.0xD Blind/Through Hole		Max. 3.0xD Blind/Through Hole							
TOOL MATERIAL			HSS-PM													
CHAMFER LEAD ACC. TO DIN2197			C		B		C		C						E	
FLUTE TYPE			Spiral Flute		Spiral Point		Straight Flute		Cold Forming						Cold Forming	
SPIRAL FLUTE ANGLE			R45		-		-		-						-	
SERIES	M	DIN371/376	TTS31 (p.B60)		TTS33 (p.B62)		TKS35 (p.B64)		TTS37 (p.B66)						TTS39 (p.B68)	
		DIN352														
		DIN357/LONG														
	MF	DIN374		TTS32 (p.B61)		TTS34 (p.B63)		TKS36 (p.B65)		TTS38 (p.B67)						
		DIN2181														
	UNC	DIN371/376														
		DIN351														
	UNF	DIN371/374														
		DIN2181														
	BSW	DIN2182/2183														
		DIN351														
	G(BSP)	DIN5156/5157														
	EG-M	DIN371/376														
	EG-UNC	DIN371/376														
	EG-UNF	DIN371/374														
SURFACE TREATMENT			TiN		TiN		TiCN		TiN							
MODEL																

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ISO	VDI 3323	Material Description	HB	HRc												
P	1	Non-alloy steel	125		◎	◎	◎	◎	○	○	◎	◎	◎			
	2		190	13	◎	◎	◎	◎	○	○	◎	◎	◎			
	3		250	25	◎	◎	◎	◎	○	○	◎	◎	◎			
	4		270	28	◎	◎	◎	◎	○	○	◎	◎	◎			
	5		300	32												
	6	Low alloy steel	180	10	◎	◎	◎	◎	○	○	◎	◎	◎			
	7		275	29	◎	◎	◎	◎	○	○	◎	◎	◎			
	8		300	32												
	9		350	38												
	10	High alloyed steel, and tool steel	200	15												
	11		325	35												
M	12	Stainless steel	200	15	◎	◎	◎	◎			◎	◎	◎			
	13		240	23	◎	◎	◎	◎			◎	◎	◎			
	14		180	10	○	○	○	○			◎	◎	◎			
K	15	Grey cast iron	180	10	○	○	○	○	◎	◎						
	16		260	26					◎	◎						
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎						
	18		250	25					◎	◎						
	19	Malleable cast iron	130						○	○						
	20		230	21					○	○						
N	21	Aluminum-wrought alloy	60								◎	◎	◎			
	22		100								◎	◎	◎			
	23	Aluminum-cast, alloyed	75		◎	◎	◎	◎	○	○	◎	◎	◎			
	24		90		◎	◎	◎	◎	○	○	◎	◎	◎			
	25		130		◎	◎	◎	◎	○	○	○	○	○			
	26	Copper and Copper Alloys (Bronze / Brass)	110		◎	◎	◎	◎								
	27		90													
	28		100		○	○	○	○			◎	◎	◎			
	29	Non Metallic Materials														
	30															
S	31	Heat Resistant Super Alloys	200	15												
	32		280	30												
	33		250	25												
	34		350	38												
	35		320	34												
	36	Titanium Alloys	400 Rm													
	37		1050 Rm													
H	38	Hardened steel	550	55												
	39		630	60												
	40	Chilled Cast Iron	400	42												
	41	Hardened Cast Iron	550	55												

SELECTION GUIDE

YG THREADING TOOLS

COMBO TAP

Max. 2.5xD Blind Hole

HOLE TYPE								
TOOL MATERIAL			HSS-E					
CHAMFER LEAD ACC. TO DIN2197			C	C	C	C	C	C	C
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute
SPIRAL FLUTE ANGLE			R40	R40	R40	R40	R40	R40	R40
SERIES	M	DIN371/376	TC804 (p.B94)	TD804 (p.B94)	TB804 (p.B94)	TCE05 (p.B96)	TDE05 (p.B96)	TBE05 (p.B96)	TCE06 (p.B97)
		DIN352							
		DIN357/LONG							
	MF	DIN374	TC844 (p.B100)	TD844 (p.B100)	TB844 (p.B100)	TCE09 (p.B103)	TDE09 (p.B103)		
		DIN2181							
	UNC	DIN371/376	TC824 (p.B108)	TD824 (p.B108)	TB824 (p.B108)	TCE01 (p.B109)	TDE01 (p.B109)		
		DIN351							
	UNF	DIN371/374	TC864 (p.B110)	TD864 (p.B110)	TB864 (p.B110)	TCE02 (p.B111)	TDE02 (p.B111)		
		DIN2181							
	BSW	DIN2182/2183							
		DIN351							
	G(BSP)	DIN5156/5157							
	EG-M	DIN371/376							
	EG-UNC	DIN371/376							
	EG-UNF	DIN371/374							
SURFACE TREATMENT			Bright	TiN	VAP	Bright	TiN	VAP	Bright
MODEL									

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ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		○	○	○	○	○	○	○
	2		190	13	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○
	11		325	35							
M	12	Stainless steel	200	15	◎	◎	◎	◎	◎	◎	◎
	13		240	23	◎	◎	◎	◎	◎	◎	◎
	14		180	10	◎	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎	◎
	16		260	26	◎	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130								
	20		230	21							
N	21	Aluminum-wrought alloy	60								
	22		100								
	23	Aluminum-cast, alloyed	75		◎	◎	◎	◎	◎	◎	◎
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110		◎	◎	◎	◎	◎	◎	◎
	27		90		◎	◎	◎	◎	◎	◎	◎
	28		100		◎	◎	◎	◎	◎	◎	◎
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42							
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

YG THREADING TOOLS

COMBO TAP

Max. 3.0xD Through Hole

HOLE TYPE			Max. 3.0xD Through Hole						
TOOL MATERIAL			HSS-E						
CHAMFER LEAD ACC. TO DIN2197			B	B	B	B	B	B	B	B
FLUTE TYPE			Spiral Point	Spiral Point	Spiral Point	Spiral Point	Spiral Point	Spiral Point	Spiral Point	Spiral Point
SPIRAL FLUTE ANGLE			-	-	-	-	-	-	-	-
SERIES	M	DIN371/376	TC814 (p.B112)	TD814 (p.B112)	TB814 (p.B112)	TCJ05 (p.B114)	TDJ05 (p.B114)	TBJ05 (p.B114)	TCJ06 (p.B115)	TDJ06 (p.B115)
		DIN352								
		DIN357/LONG								
	MF	DIN374	TC854 (p.B118)	TD854 (p.B118)	TB854 (p.B118)	TCJ09 (p.B121)	TDJ09 (p.B121)			
		DIN2181								
	UNC	DIN371/376	TC834 (p.B125)	TD834 (p.B125)	TB834 (p.B125)	TCJ01 (p.B126)	TDJ01 (p.B126)			
		DIN351								
	UNF	DIN371/374	TC874 (p.B127)	TD874 (p.B127)	TB874 (p.B127)	TCJ02 (p.B128)	TDJ02 (p.B128)			
		DIN2181								
	BSW	DIN2182/2183								
		DIN351								
	G(BSP)	DIN5156/5157								
	EG-M	DIN371/376								
	EG-UNC	DIN371/376								
	EG-UNF	DIN371/374								
SURFACE TREATMENT			Bright	TiN	VAP	Bright	TiN	VAP	Bright	TiN
MODEL										
ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		○	○	○	○	○	○	○	○
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○	○
	11		325	35								
M	12	Stainless steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎
	13		240	23	◎	◎	◎	◎	◎	◎	◎	◎
	14		180	10	◎	◎	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎	◎	◎
	16		260	26	◎	◎	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130									
	20		230	21								
N	21	Aluminum-wrought alloy	60									
	22		100									
	23	Aluminum-cast, alloyed	75		◎	◎	◎	◎	◎	◎	◎	◎
	24		90									
	25		130									
	26	Copper and Copper Alloys (Bronze / Brass)	110		◎	◎	◎	◎	◎	◎	◎	◎
	27		90		◎	◎	◎	◎	◎	◎	◎	◎
	28		100		◎	◎	◎	◎	◎	◎	◎	◎
	29	Non Metallic Materials										
	30											
S	31	Heat Resistant Super Alloys	200	15								
	32		280	30								
	33		250	25								
	34		350	38								
	35		320	34								
	36	Titanium Alloys	400 Rm									
	37		1050 Rm									
H	38	Hardened steel	550	55								
	39		630	60								
	40	Chilled Cast Iron	400	42								
	41	Hardened Cast Iron	550	55								

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SELECTION GUIDE

YG

THREADING TOOLS

YG TAP STEEL

Max. 2.5xD Blind Hole

HOLE TYPE									
TOOL MATERIAL			HSS-PM		HSS-E				
CHAMFER LEAD ACC. TO DIN2197			C	C	C	C	C	C	C
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute
SPIRAL FLUTE ANGLE			R40	R40	R40	R40	R40	R40	R40
SERIES	M	DIN371/376	TQ823 (p.B136)	TR823 (p.B137)	TC312 (p.B138)	TD312 (p.B139)	TB312 (p.B140)	TY312 (p.B141)	TB913 (p.B147)
		DIN352							
		DIN357/LONG							
	MF	DIN374			TC413 (p.B142)	TD413 (p.B143)			
		DIN2181							
	UNC	DIN371/376			TC174 (p.B144)	TD174 (p.B145)			
		DIN351							
	UNF	DIN371/374			TC184 (p.B146)				
		DIN2181							
	BSW	DIN2182/2183							
		DIN351							
	G(BSP)	DIN5156/5157							
	EG-M	DIN371/376							
	EG-UNC	DIN371/376							
	EG-UNF	DIN371/374							
SURFACE TREATMENT			VAP	Bright	Bright	TiN	VAP	TiAlN	VAP
MODEL									

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◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125							
	2		190	13	○	○	○	○	○	○	○
	3		250	25	○	○	○	○	○	○	○
	4		270	28	○	○	○	○	○	○	○
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○	○
	7		275	29	○	○	○	○	○	○	○
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○
	11		325	35							
M	12	Stainless steel	200	15							
	13		240	23							
	14		180	10	○	○	○	○	○	○	○
K	15	Grey cast iron	180	10							
	16		260	26							
	17	Nodular cast iron	160	3							
	18		250	25							
	19	Malleable cast iron	130							
	20		230	21							
N	21	Aluminum-wrought alloy	60							
	22		100							
	23	Aluminum-cast, alloyed	75							
	24		90							
	25		130							
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials								
	30									
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○	○	○	○
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm		○	○	○	○	○	○	○
	37		1050 Rm							
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42							
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

YG
THREADING TOOLS

YG TAP INOX

HOLE TYPE			Max. 2.0xD Blind Hole	Max. 2.5xD Blind Hole					
TOOL MATERIAL			HSS-E	HSS-PM		HSS-E			
CHAMFER LEAD ACC. TO DIN2197			C	C	C	C	C	C	C
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute
SPIRAL FLUTE ANGLE			R40	R40	R40	R40	R40	R40	R40
SERIES	M	DIN371/376	TB711 (p.B174)	TQ813 (p.B175)	TR813 (p.B176)	TB914 (p.B177)	TI914 (p.B177)	TBE15 (p.B178)	TBE16 (p.B179)
		DIN352							
		DIN357/LONG							
	MF	DIN374				TB183 (p.B187)			
		DIN2181							
	UNC	DIN371/376				TB904 (p.B188)			
		DIN351							
	UNF	DIN371/374				TB924 (p.B189)			
		DIN2181							
	BSW	DIN2182/2183							
		DIN351							
	G(BSP)	DIN5156/5157							
	EG-M	DIN371/376							
	EG-UNC	DIN371/376							
	EG-UNF	DIN371/374							
SURFACE TREATMENT			VAP	VAP	Bright	VAP	TiCN	VAP	VAP
MODEL									

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ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		◎	○	○	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎
	3		250	25		○	○	○	○	○	○
	4		270	28		○	○	○	○	○	○
	5		300	32							
	6	Low alloy steel	180	10		○	○	○	○	○	○
	7		275	29							
	8		300	32							
	9		350	38							
	10	High alloyed steel, and tool steel	200	15							
	11		325	35							
M	12	Stainless steel	200	15	○	◎	◎	◎	◎	◎	◎
	13		240	23	○	◎	◎	◎	◎	◎	◎
	14		180	10	○	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10							
	16		260	26							
	17	Nodular cast iron	160	3							
	18		250	25							
	19	Malleable cast iron	130								
	20		230	21							
N	21	Aluminum-wrought alloy	60		○						
	22		100								
	23	Aluminum-cast, alloyed	75								
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100		○						
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15		○	○	○	○	○	○
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm			○	○	○	○	○	○
	37		1050 Rm								
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42							
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

YG
THREADING TOOLS

YG TAP HARDENED STEEL

HOLE TYPE			Max. 2.0xD Blind / Through Hole		Max. 2.5xD Blind Hole			Max. 3.0xD Through Hole
TOOL MATERIAL			CARBIDE		HSS-E			
CHAMFER LEAD ACC. TO DIN2197			C	D	C	C	C	B	B
FLUTE TYPE			Straight Flute	Straight Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Point	Spiral Point
SPIRAL FLUTE ANGLE			-	-	R40	R40	R40	-	-
SERIES	M	DIN371/376	T0997-TIC (p.B210)	T0999-TIC (p.B211)	TC313 (p.B212)	TB313 (p.B213)	TY313 (p.B214)	TC283 (p.B215)	TY283 (p.B216)
		DIN352							
		DIN357/LONG							
	MF	DIN374							
		DIN2181							
	UNC	DIN371/376							
		DIN351							
	UNF	DIN371/374							
		DIN2181							
	BSW	DIN2182/2183							
		DIN351							
	G(BSP)	DIN5156/5157							
	EG-M	DIN371/376							
	EG-UNC	DIN371/376							
	EG-UNF	DIN371/374							
SURFACE TREATMENT			TiCN	TiCN	Bright	VAP	TiAlN	Bright	TiAlN
MODEL									
P	1	Non-alloy steel	125						
	2		190	13					
	3		250	25					
	4		270	28					
	5		300	32					
	6	Low alloy steel	180	10					
	7		275	29	○	○	○	○	○
	8		300	32	○	○	○	○	○
	9		350	38	○	○	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15					
	11		325	35					
M	12	Stainless steel	200	15					
	13		240	23					
	14		180	10	○	○	○	○	○
K	15	Grey cast iron	180	10					
	16		260	26					
	17	Nodular cast iron	160	3					
	18		250	25					
	19	Malleable cast iron	130						
	20		230	21					
N	21	Aluminum-wrought alloy	60						
	22		100						
	23	Aluminum-cast, alloyed	75						
	24		90						
	25		130						
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○
	27		90						
	28		100						
	29	Non Metallic Materials							
	30								
S	31	Heat Resistant Super Alloys	200	15					
	32		280	30					
	33		250	25					
	34		350	38					
	35		320	34					
	36	Titanium Alloys	400 Rm						
	37		1050 Rm						
H	38	Hardened steel	550	55	◎	◎			
	39		630	60	◎	◎			
	40	Chilled Cast Iron	400	42	◎	◎			
	41	Hardened Cast Iron	550	55	◎	◎			

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SELECTION GUIDE

YG
THREADING TOOLS

YG TAP ALU

HOLE TYPE			Max. 2.5xD Blind Hole		Max. 3.0xD Through Hole		Max. 2.0xD Blind/Through Hole	
TOOL MATERIAL			HSS-E					
CHAMFER LEAD ACC. TO DIN2197			C	C	B	B	C	C	C
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Point	Spiral Point	Straight Flute	Straight Flute	Straight Flute
SPIRAL FLUTE ANGLE			R45	R40	-	-	-	-	-
SERIES	M	DIN371/376	TC163 (p.B238)	TE953 (p.B239)	TC622 (p.B243)	TE943 (p.B244)	TC433 (p.B245)	TE443 (p.B246)	TY433 (p.B247)
		DIN352							
		DIN357/LONG							
	MF	DIN374	TC963 (p.B240)						
		DIN2181							
	UNC	DIN371/376	TC169 (p.B241)						
		DIN351							
	UNF	DIN371/374	TC170 (p.B242)						
		DIN2181							
	BSW	DIN2182/2183							
		DIN351							
	G(BSP)	DIN5156/5157							
	EG-M	DIN371/376							
	EG-UNC	DIN371/376							
	EG-UNF	DIN371/374							
SURFACE TREATMENT			Bright	Nitride	Bright	Nitride	Bright	Nitride	TiAlN
MODEL									

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ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		○		○				
	2		190	13	○		○				
	3		250	25	○	○	○	○			
	4		270	28							
	5		300	32							
	6	Low alloy steel	180	10							
	7		275	29							
	8		300	32							
	9		350	38							
	10	High alloyed steel, and tool steel	200	15							
	11		325	35							
M	12	Stainless steel	200	15							
	13		240	23							
	14		180	10							
K	15	Grey cast iron	180	10							
	16		260	26							
	17	Nodular cast iron	160	3							
	18		250	25							
	19	Malleable cast iron	130								
	20		230	21							
N	21	Aluminum-wrought alloy	60		◎	○	◎	○			
	22		100		◎	○	◎	○			
	23	Aluminum-cast, alloyed	75		◎	○	◎	○			
	24		90		◎	○	◎	○			
	25		130			◎		○			
	26	Copper and Copper Alloys (Bronze / Brass)	110						◎	◎	◎
	27		90		○		○		○	○	○
	28		100						○		○
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42							
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

THREADING TOOLS

YG TAP GENERAL

HOLE TYPE			Max. 2.5xD Blind Hole			Max. 3.0xD Through Hole		
TOOL MATERIAL			HSS-E					
CHAMFER LEAD ACC. TO DIN2197			C	C	C	B	B	B
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Flute	Spiral Point	Spiral Point	Spiral Point
SPIRAL FLUTE ANGLE			R40	R40	R20	-	-	-
SERIES	M	DIN371/376	TC711 (p.B272)	TD711 (p.B273)	TC517 (p.B280)	TC127 (p.B282)	TD127 (p.B283)	TC227 (p.B291)
		DIN352			TC612 (p.B281)	TC122 (p.B284)		
		DIN357/LONG						
	MF	DIN374	TC411 (p.B274)	TD411 (p.B276)		TC222 (p.B285)	TD222 (p.B287)	
		DIN2181						
	UNC	DIN371/376	TC144 (p.B277)			TC214 (p.B288)		
		DIN351						
	UNF	DIN371/374	TC124 (p.B278)			TC234 (p.B289)		
		DIN2181						
	BSW	DIN2182/2183	TC134 (p.B279)			TC224 (p.B290)		
		DIN351						
	G(BSP)	DIN5156/5157						
	EG-M	DIN371/376						
	EG-UNC	DIN371/376						
	EG-UNF	DIN371/374						
SURFACE TREATMENT			Bright	TiN	Bright	Bright	TiN	Bright
MODEL								

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ISO	VDI 3323	Material Description	HB	HRc					
P	1	Non-alloy steel	125		○	○	○	○	○	○
	2		190	13	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎
	5		300	32	○	○	○	○	○	○
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎
	8		300	32	○	○	○	○	○	○
	9		350	38						
	10	High alloyed steel, and tool steel	200	15						
	11		325	35						
M	12	Stainless steel	200	15	○	○	○	○	○	○
	13		240	23	○	○	○	○	○	○
	14		180	10						
K	15	Grey cast iron	180	10						
	16		260	26						
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130							
	20		230	21						
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○
	22		100							
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○
	24		90		○	○	○	○	○	○
	25		130		◎	◎	◎	◎	◎	◎
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○
	27		90							
	28		100		◎	◎	◎	◎	◎	◎
	29	Non Metallic Materials								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55						
	39		630	60						
	40	Chilled Cast Iron	400	42						
	41	Hardened Cast Iron	550	55						

SELECTION GUIDE

YG THREADING TOOLS

			YG TAP GENERAL		PIPE TAP	
HOLE TYPE			Max. 2.0xD Blind/Through Hole		Max. 2.0xD Blind/Through Hole	Max. 2.5xD Blind Hole
TOOL MATERIAL			HSS-E		HSS	HSS-E
CHAMFER LEAD ACC. TO DIN2197			I / II / III	I / II / III	I/III	C
FLUTE TYPE			Straight Flute	Straight Flute	Straight Flute	Spiral Flute
SPIRAL FLUTE ANGLE			-	-	-	R40
SERIES	M	DIN371/376				
		DIN352	TB373 (p.B305)	TC353 (p.B306)		
		DIN357/LONG				
	MF	DIN374				
		DIN2181				
	UNC	DIN371/376				
		DIN351				
	UNF	DIN371/374				
		DIN2181				
	BSW	DIN2182/2183				
		DIN351				
	G(BSP)	DIN5156/5157			T7709 (p.B311)	TC728 (p.B312)
	EG-M	DIN371/376				
	EG-UNC	DIN371/376				
	EG-UNF	DIN371/374				
SURFACE TREATMENT			VAP	Bright	Bright	Bright
MODEL						

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ISO	VDI 3323	Material Description	HB	HRc				
P	1	Non-alloy steel	125		○	○	○	
	2		190	13	○	○	○	◎
	3		250	25	○	○	○	◎
	4		270	28	○	○		◎
	5		300	32				
	6	Low alloy steel	180	10	○	○	○	◎
	7		275	29	○	○		◎
	8		300	32				
	9		350	38				
	10	High alloyed steel, and tool steel	200	15				
	11		325	35				
M	12	Stainless steel	200	15	○			
	13		240	23	○			
	14		180	10	○			
K	15	Grey cast iron	180	10			○	
	16		260	26			○	
	17	Nodular cast iron	160	3				◎
	18		250	25				◎
	19	Malleable cast iron	130					
	20		230	21				
N	21	Aluminum-wrought alloy	60				○	○
	22		100				○	○
	23	Aluminum-cast, alloyed	75				○	○
	24		90					○
	25		130					◎
	26	Copper and Copper Alloys (Bronze / Brass)	110					◎
	27		90					○
	28		100					
	29	Non Metallic Materials						
	30							
S	31	Heat Resistant Super Alloys	200	15				
	32		280	30				
	33		250	25				
	34		350	38				
	35		320	34				
	36	Titanium Alloys	400 Rm					
	37		1050 Rm					
H	38	Hardened steel	550	55				
	39		630	60				
	40	Chilled Cast Iron	400	42				
	41	Hardened Cast Iron	550	55				

CUTTING SPEED TABLE SCHNITTGESCHWINDIGKEITSTABELLE
Cutting Speeds m/min. into revolutions per minute

TOOL RPM (rev/min.)																
Tool Dia.	Cutting Speed (m/min.)															
	1	2	3	4	5	6	8	10	12	15	20	25	30	40	50	60
1	318	637	955	1274	1592	1910	2548	3185	3822	4777	6396	7962	9554	12739	15924	19108
2	159	318	478	637	796	955	1274	1592	1911	2388	3185	3981	4777	6369	7962	9554
3	106	212	318	425	531	637	849	1062	1274	1592	2123	2654	3185	4246	5308	6369
4	80	159	239	318	398	478	637	796	955	1194	1592	1990	2389	3185	3981	4777
5	64	127	191	255	318	382	510	637	764	955	1274	1592	1911	2548	3185	3822
6	53	106	159	212	265	318	425	531	637	796	1062	1327	1592	2123	2653	3185
8	40	80	119	159	199	239	318	398	478	597	796	955	1194	1592	1990	2388
10	31	64	96	127	159	191	255	318	382	478	637	796	955	1274	1592	1911
12	26	53	80	106	133	159	212	265	318	398	531	663	796	1062	1327	1592
14	23	45	68	91	114	136	182	227	273	341	455	569	682	910	1137	1365
16	20	40	60	80	100	119	159	199	239	299	398	498	597	796	995	1194
18	18	35	53	71	88	106	142	177	212	265	354	442	531	708	885	1062
20	16	32	48	64	80	96	127	159	191	239	318	398	478	637	796	955
25	13	25	38	51	64	76	102	127	153	191	255	318	382	510	637	764
30	11	21	32	42	53	64	85	106	127	159	212	265	318	425	531	637
35	9	18	27	36	45	55	73	91	109	136	182	227	273	364	455	546
40	8	16	24	32	40	48	64	80	96	119	159	199	239	118	398	478

RPM = rev/min.
V = m/min.
D = Dia.(mm)

$$V = \frac{RPM \cdot \pi \cdot D}{1000}$$

$$RPM = \frac{1000 \cdot V}{\pi \cdot D}$$

EXAMPLES FOR APPLICATION MATERIAL GROUPS

11 Magnetic Soft Steels < 400 N/mm²

1.1013	RFe 100
1.1014	RFe 80
1.1015	RFe 60
1.0718	9 S MnPb 28

12 Structure/Case Carburizing Steels < 700 N/mm²

1.0037	St 37-2
1.0050	St 50-2
1.0060	St 60-2
1.0070	St 70-2
1.0401	C 15
1.1141	Ck 15

13 Plain Carbon Steels < 850 N/mm²

1.0501	C 35
1.0503	C 45
1.0535	C 55
1.0601	C 60
1.1181	Ck 35
1.1191	Ck 45

14 Alloy Steels < 850 N/mm²

1.2080	X210Cr12
1.2363	X100CrMoV5-1
1.3243	S 6-5-2-5
1.3343	S 6-5-2
1.7218	25CrMo4
1.7220	34CrMo4

15 Alloy, Hardened & Tempered Steels < 1,200 N/mm²

1.2581	X30WCrV9 3
1.2622	X60WCrMoV9
1.2550	60WCrV7
1.6580	30CrNiMo8
1.7361	32CrMo12
1.8515	31CrMo12

16 Alloy, Hardened & Tempered Steels > 1,200 N/mm²

To this group belong most of the materials of group 15, but present a higher tensile strength.

21 Free machining stainless Steels < 850 N/mm²

1.4005	X12CrS13
1.4006	X10Cr13
1.4016	X6Cr17
1.4104	X12CrMoS17
1.4305	X10CrNiS18 9

22 Austenitic stainless Steels < 850 N/mm²

1.4301	X5CrNi18 10
1.4406	X2CrNiMoN17 12 2
1.4435	X2CrNiMo18 14 3
1.4541	X6CrNiTi18 10
1.4571	X6CrNiMoTi17 12 2
1.4828	X15CrNiSi20 12

23 Matensitic/Ferritic/Fer.-Aus. Stainless Steels < 1,000 N/mm²

1.4112	X90CrMoV18
1.4125	X105CrMo17
1.4002	X6CrAl13
1.4512	X6CrTi12
1.4582	X4CrNiMoNb25 7
1.4821	X20CrNiSi25 4

31 Grey graphite cast irons < 500 N/mm²

0.6015	GG-15
0.6020	GG-20
0.6025	GG-25
0.6030	GG-30
0.6035	GG-35
0.6040	GG-40

32 Grey graphite cast irons < 1,000 N/mm²

0.6020	GG-20
0.6025	GG-25
0.6030	GG-30
0.6035	GG-35
0.6040	GG-40

33 Nodular graphite, Malleable cast irons < 700 N/mm²

0.7040	GGG-40
0.7043	GGG-40.3
0.7050	GGG-50
0.7060	GGG-60
0.8040	GTW-40
0.8065	GTW-65

34 Nodular graphite, Malleable cast irons < 1,000 N/mm²

0.7040	GGG-40
0.7043	GGG-40.3
0.7050	GGG-50
0.7060	GGG-60
0.7070	GGG-70
0.7080	GGG-80

41 Titanium unalloys < 700 N/mm²

3.7024	Ti99.5
3.7034	Ti99.7
3.7035	Ti2
3.7055	Ti99.4
3.7064	Ti99.2
3.7065	Ti4

42 Titanium alloys < 900 N/mm²

	TiA14Mn4
3.7114	TiA15Sn2
3.7124	TiCu2
3.7164	TiA16V4
3.7174	TiA16V6Sn2

43 Titanium alloys < 1,300 N/mm²

3.7124	TiCu2
3.7144	TiA16Sn2Zr4Mo2
3.7154	TiAl6Zr5
3.7164	TiA16V4
3.7174	TiA16V6Sn2
3.7184	TiAl4Mo4Sn2

51 Nickel unalloys < 500 N/mm²

2.1504	NiAlBz
2.4042	Ni99CSi
2.4060	Ni99.6
2.4062	Ni99.4Fe

52 Heat resisting Nickel alloys < 900 N/mm²

2.4360	Monel 400
2.4374	Monel 500
2.4665	Hastelloy X
2.4812	Hastelloy C
2.4816	Inconel 600
1.4876	Incoloy 800

53 Heat resisting Nickel alloys < 1,400 N/mm²

2.4631	Nimonic80A
2.4632	Nimonic90
2.4634	Nimonic105
2.4662	Nimonic901
2.4668	Inconel 718
2.4669	Inconel X-750

61 Copper unalloys < 350 N/mm²

2.0060	E-Cu57
2.0070	SE-Cu
2.0090	SF-Cu
2.1356	CuMn3
2.1522	CuSi2Mn

62 Short chip Brass, Bronze copper alloys < 700N/mm²

2.0360	CuZn40 (Ms60)
2.0380	CuZn39Pb2 (Ms58)
2.0410	CuZn44Pb2
2.0580	CuZn40Mn1Pb
2.1086	G-CuSn10Zn
2.1096	G-CuSn5ZnPb

63 Long chip Brass, Bronze copper alloys < 700 N/mm²

2.0250	CuZn20
2.0321	CuZn37
2.1020	CuSn6
2.1080	CuSn6Zn6
2.1245	CuBel.7
2.1293	CuCrZr

64 Cu-Al-Fe alloys < 1,500 N/mm²

71 Aluminum-Magnesium unalloys < 350 N/mm²

3.0250	Al99.5H
3.0280	Al99.8H
3.0305	Al99.9
3.3308	Al99.9Mg0.5

72 Aluminum alloys, Si < 1.5% < 600 N/mm²

3.0515	AlMn1
3.0525	AlMn1Mg0.5
3.1325	AlCuMg1
3.3315	AlMg1
3.3241	G-AlMg3Si
3.3292	GD-AlMg9

73 Aluminum alloys, 0.5-10% Si < 600 N/mm²

3.2134	G-AlSi5Cu1Mg
3.2152	GD-AlSi6Cu4
3.2162	GD-AlSi8Cu3
3.2373	G-AlSi9Mg

74 Aluminum alloys, Si > 10% < 600 N/mm²

3.2381	G-AlSi10Mg
3.2383	G-AlSi10Mg(Cu)
3.2581	G-AlSi12
3.2583	G-AlSi12(Cu)
3.5662	G-MgA16
3.5812	G-MgA18Zn1

81 Thermoplastics

Delrin(POM)
Teflon
Nylon

82 Thermosseting plastics

Bakelit
Novopan

83 Reinforced plastics materials

Glass fiber reinforced
Thermo and Duroplastics

Referance:DIN

MATERIAL GROUP

STANDARDS

GERMANY		FRANCE	GREAT BRITAIN	EN & OTHER	U.S.A.
W.Nr	DIN	AFNOR	B.S.	CLASSIFICATIONS	AISI
14 - Alloy steels - Hardness < 250 HB 30, < 25 HRC - Tensile strength < 850 N/mm²					
14.1 - Cold work tool steels					
1.2056	90 Cr 3				
1.2067	100 Cr 6	Y 100 C 6	BL 3		L 1 L 3
1.2080	X 210 Cr 12	Z 200 C 12	BD 3		D3
1.2083	X 42 Cr 13	Z 40 C 14			420
1.2363	X 100 CrMoV5 1	Z 100 CDV 5	BA 2		A 2
1.2379	X 155 CrVMo 12 1	Z 160 CDV 12	BD 2		D 2
1.2510	100 MnCrW 4	90 MWCV 5	BO 1		O1
1.2550	60 WCrV 7	55WC 20	BS 1		S1
1.2823	70 Si 7				
1.2826	60 Mn Si Cr 4				
1.2842	90 MnCrV 8	90 MV 8	BO 2		O 2
14.2 - High speed steels					
1.3202	S 12-4-4-5	Z 130 WKCV 12-05-04-04	BT 15		T 15
1.3207	S 10-4-3-10	Z130 WKCDV10-10-04-04-03	BT 42		T 42
1.3243	S 6-5-2-5	Z85 WDKCV 06-05-05-04-02	BM 35		M 35
1.3247	S 2-10-1-8	Z110 DKCWV 09-08-04-02-01	BM 42		M 42
1.3343	S 6-5-2	Z 85 WDCV 06-05-04-02	BM 2		M 2
1.3344	S 6-5-3	Z 120 WDCV 06-05-04-03			M 3 / 2
1.3348	S 2-9-2	Z 100 DCWV 09-04-02-02			M 7
ASP 23	(S 6-5-3)				
ASP 30					
ASP 60					
14.3 - Alloy steels					
1.5919	GS-15Cr Ni 6	16 NC 6			3115
1.7218	GS-25Cr Mo 4	25 C D 4	70 8A 25		4130
1.7220	GS-34Cr Mo 4	35 C D 4	70 8A 37		4135 4137
1.7379	GS-18 Cr Mo 9 10				
14.4 - Tempered steels					
1.0503	C 45	1 C 45	060 A 47		1045
1.7220	34 Cr Mo 4	34 Cr Mo 4	708 A 37		4135, 4137
1.7225	42 Cr Mo 4	42 CD 4	708 A 42	EN 16, 17, 19	4140, 4142
1.7228	50 Cr Mo 4	50 Cr Mo 4	708 A 47		4150
14.5 - Nitriding steels					
1.7779	20 Cr Mo V 13.5				
1.8504	34 Cr Al 6				
1.8506	34 Cr Al S 5				
1.8507	34 Cr Al Mo 5	30 CAD 6.12			A 355 Cl.D
1.8509	41 Cr Al Mo 7	40 CAD 6.12	905 M 39		A 355 Cl.A
1.8515	31 Cr Mo 12	30 CD 12	722 M 24		
15 - Alloy steels / Tempered steels - Hardness 250-350 HB 30, 25-38 HRC - Tensile strength 850-1,200 N/mm²					
15.1 - Alloy steels for tools					
1.2311	40 Cr Mn Mo 7				
1.2312	40 Cr Mn Mo S 86				
1.2436	X 210 Cr W 12	Z 200 CW 12			
1.2711	54 Ni Cr Mo V 6				
1.2713	55 Ni Cr Mo V 6	55 NCDV 7	826 M 40	S 95, S 97, S 98	L 6
1.2714	56 Ni Cr Mo V 7				
1.2743	60 Ni Cr Mo V 12 4				
1.2766	35 Ni Cr Mo 16				
15.2 - Alloy steels for hot work					
1.2343	X 38 Cr Mo V 5 1	Z 38 CDV 5	BH 11		H 11
1.2344	X 40 Cr Mo V 5 1	Z 40 CDV 5	BH 13		H 13
1.2365	X 32 Cr Mo V 3 3	32 DCV 28	BH 10		H 10
1.2367	X 40 Cr Mo V 5 3	Z 38 CDV 5.3			
1.2581	X 30 W Cr V 9 3	Z 30 WCV 9.3	BH 21		H 21
1.2622	X 60 W Cr Mo V 9				
1.2678	X 45 CoCrWV 5 5 5				
1.2550	60 WCr V 7	55 WC 20	BS 1		S 1
1.2567	X 30 W Cr V 5 3	Z 32 WCV 5			

MATERIAL GROUP

STANDARDS

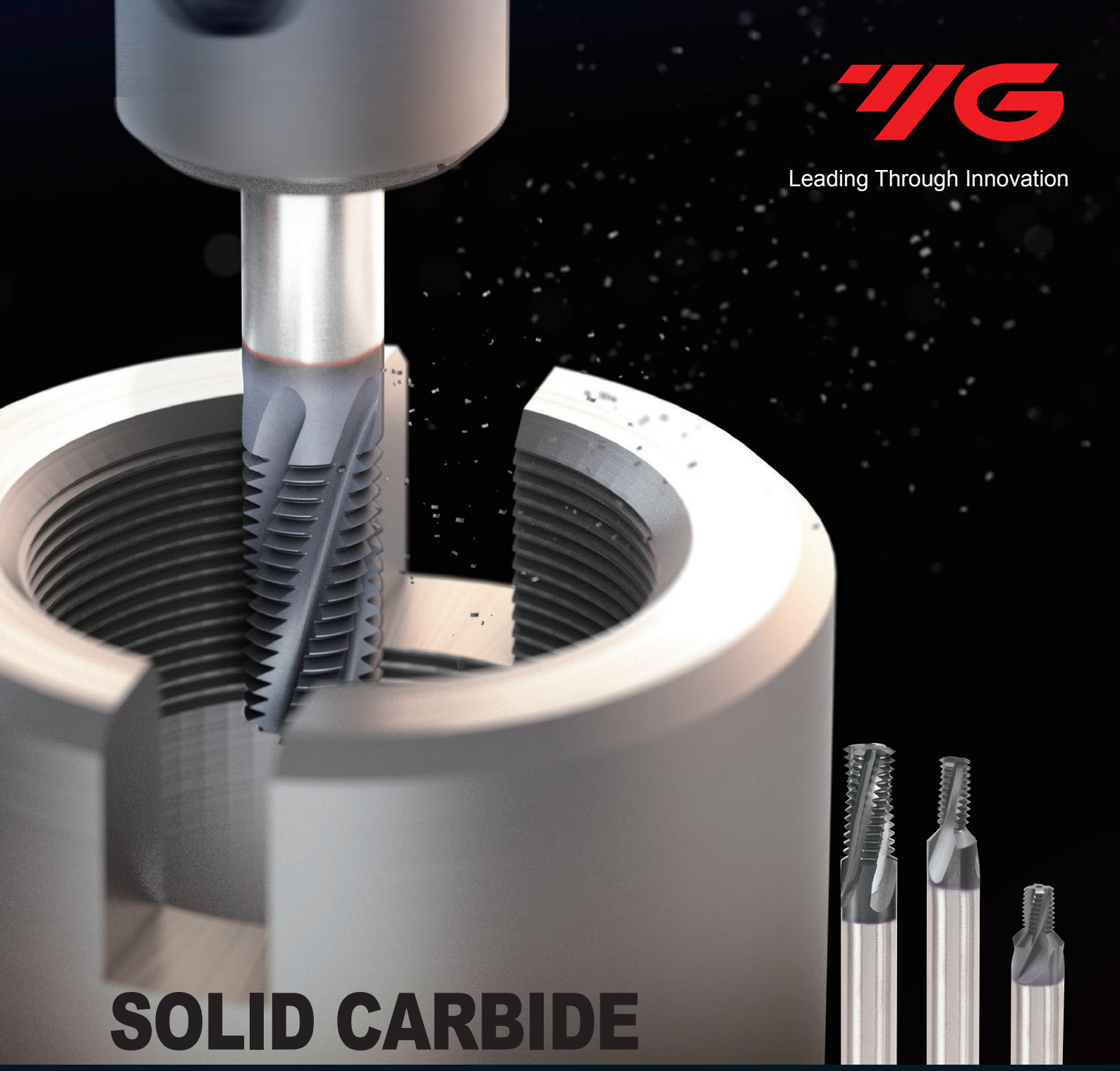
GERMANY		FRANCE	GREAT BRITAIN	EN & OTHER	U.S.A.
W.Nr	DIN	AFNOR	B.S.	CLASSIFICATIONS	AISI
30 - CAST IRONS					
31 - Grey graphite cast irons - Hardness < 150 HB 30 - Tensile strength < 500 N/mm²					
0.6010	GG-10	Ft 10 D			A 48-20 B
0.6015	GG-15	Ft 20 D	Grade 150	Grey cast iron soft	A 48-25 B
0.6020	GG-20	Ft 25 D	Grade 220		A 48-30 B
0.6025	GG-25	Ft 30 D	Grade 260		A 48-40 B
0.6030	GG-30	Ft 30 D	Grade 300		A 48-45 B
0.6035	GG-35	Ft 35 D	Grade 350		A 48-50 B
0.6040	GG-40	Ft 40 D	Grade 400		A 48-60 B
31.1 - Meehanite - Hardness < 150 HB 30 - Tensile strength < 500 N/mm²					
.....	GF-150				
.....	GD-260				
32 - Grey graphite cast irons - Hardness 150 - 300 HB 30 - Tensile strength 500 - 1,000 N/mm²					
0.6020	GG - 20	Ft 25 D	Grade 220	Grey cast iron hard	A 48-30 B
0.6025	GG - 25	Ft 30 D	Grade 260		A 48-40 B
0.6030	GG - 30	Ft 30 D	Grade 300		A 48-45 B
0.6035	GG - 35	Ft 35 D	Grade 350		A 48-50 B
0.6040	GG - 40	Ft 40 D	Grade 400		A 48-60 B
32.1 - Meehanite - Hardness 150-300 HB 30 - Tensile strength 500-1,000 N/mm²					
.....	GF-150				
.....	GD-260				
15 - Alloy steels / Tempered steels - Hardness 250-350 HB 30, 25-38 HRC - Tensile strength 850-1,200 N/mm²					
0.7033	GGG-35.3				
0.7040	GGG-40	FGS 400-12	420 / 12		60-40-18
0.7043	GGG-40.3	FGS 370-17	370 / 17		
0.7050	GGG-50	FGS 500-7	500 / 7		65-45-12
0.7060	GGG-60	FGS 600-3	600 / 3	S.G.iron, Meehanite	80-55-06
0.8035	GTW-35		700/2,30g/72	Black & White Heart	
0.8040	GTW-40				
0.8045	GTW-45				
0.8065	GTW-65				
0.8135	GTS-35				
0.8145	GTS-45				
0.8155	GTS-55				
0.8165	GTS-65				
33.1 - Meehanite - Hardness < 200 HB 30 -Tensile strength < 700 N/mm²					
SF 400					
SPF 600					
34 - Nodular graphite, tempered malleable cast irons - Hardness 200-300 HB 30 - Tensile strength 700-1,000 N/mm²					
0.7070	GGG-70	FGS 700-2	700 / 2	S.G.iron,Meehanite	100-70-03
0.7080	GGG-80	FGS 800-2	800 / 2	Black & White Heart	120-90-02
And materials from group 33 tempered					
34.1 - Meehanite - Hardness 200-300 HB 30 - Tensile strength 700-1,000 N/mm²					
	SH 800		420/12, P 440/7		
	SH 1000				
40 - TITANIUM					
41 - Titanium, unalloys - Hardness < 200 HB 30 - Tensile strength < 700 N/mm²					
3.7024.1LN	Ti 99.5				
3.7034.1LN	Ti 99.7				
3.7035	Ti 2				
3.7055	Ti 99.4		TA 1-9	Ti 99.0	
3.7064.1LN	Ti 99.2				
3.7065	Ti 4				
3.7255	Ti 3 Pd				

MATERIAL GROUP

STANDARDS

GERMANY		FRANCE AFNOR	GREAT BRITAIN B.S.	EN & OTHER CLASSIFICATIONS	U.S.A. AISI
W.Nr	DIN				
63 - Long chip copper alloys - Hardness < 200 HB 30 - Tensile strength < 700 N/mm²					
63.1 - Brass					
2.0250	Cu Zn 20				
2.0265	Cu Zn 30				
2.0321	Cu Zn 37		CZ108, CZ106		
2.0335	Cu Zn 36 (Ms 63)				
63.2 - Bronzes					
2.1020	Cu Sn 6				
2.1030	Cu Sn 8				
2.1080	Cu Sn 6 Zn 6				
63.3 - Copper alloys tempered by forging					
2.1245	Cu Be 1.7				
2.1247	Cu Be 2				
2.1293	Cu Cr Zr				
64 - Cu - Al - Fe alloys Hardness < 440 HB 30 - Tensile strength < 1,500 N/mm²					
70 - ALUMINIUM - MAGNESIUM					
71 - Aluminum - Magnesium, unalloys - Hardness < 100 HB 30 - Tensile strength < 350 N/mm²					
3.0250	Al 99.5 H				
3.0280	Al 99.8 H				
3.0305	Al 99.9				
3.3308	Al 99.9 Mg 0.5				
72 - Aluminum alloys, Si < 1.5% - Hardness < 180 HB 30 - Tensile strength < 600 N/mm²					
72.1 - Forging aluminum alloys					
3.0515	Al Mn 1				
3.0516	S-Al Mn				
3.0525	Al Mn 1 Mg 0.5				
3.0615	Al Mg Si Pb				
3.1325	Al Cu Mg 1				
3.1355	Al Cu Mg 2				
3.3315	Al Mg 1				
3.3535	Al Mg 3				
3.4365	Al Zn Mg Cu 1.5				
72.2 - Cast aluminum alloys					
3.1841	G - Al Cu 4 Ti				
3.3241	G - Al Mg 3 Si				
3.3292	GD - Al Mg 9				
73 - Aluminum alloys, 0.5-10% Si - Hardness < 180 HB 30 - Tensile strength < 600 N/mm²					
73.1 - Cast aluminum alloys					
3.2134	G - Al Si 5 Cu 1 Mg				
3.2152	GD - Al Si 6 Cu 4				
3.2162	GD - Al Si 8 Cu 3				
3.2373	G - Al Si 9 Mg				
74 - Aluminum alloys, Si > 10% - Hardnes < 180 HB 30 - Tensile strength < 600 N/mm²					
74.1 - Cast aluminum alloys					
3.2381	G - Al Si 10 Mg				
3.2383	G - Al Si 10 Mg (Cu)				
3.2581	G - Al Si 12				
3.2583	G - Al Si 12 (Cu)				
3.2982	GD - Al Si 12 (Cu)				
74.2 - Cast aluminum - magnesium alloys					
3.5106	G - Mg Ag 3 SE 2 Zr 1				
3.5662	G - Mg Al 6				
3.5812	G - Mg Al 8 Zn 1				
3.5912	G - Mg Al 9 Zn 1				

Leading Through Innovation



SOLID CARBIDE

THREAD MILL
GEWINDEFRÄSER

- **Threading Large Diameter in High Quality Available with Chamfer**
- **Zur Fertigung von Gewinden mit großen Durchmessern in hoher Qualität, verfügbar mit Fase**

SELECTION GUIDE

YG THREADING TOOLS

SOLID CARBIDE THREAD MILL

Threading Large Diameter in High Quality
Available with Chamfer

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B54

TYPE	Thread Mill without Coolant Hole			
THREAD FORM	M	MF	UNC	UNF
HOLE TYPE	Max. 2.0xD Blind /Through Hole	Max. 1.5xD Blind /Through Hole	Max. 2.0xD Blind /Through Hole	Max. 2.0xD Blind /Through Hole
TOOL MATERIAL	CARBIDE			
FLUTE TYPE	Helix			
HELIX ANGLE	R15			
SERIES NO.	L1211 (p.B36)	L1212 (p.B37)	L1213 (p.B38)	L1214 (p.B39)
SURFACE TREATMENT	TiAlN	TiAlN	TiAlN	TiAlN
MODEL				

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○	○	○
	14		Austenitic		180	10	○	○	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎
	17	Nodular Cast Iron	Ferritic		160	3	◎	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	◎	◎	◎
	20		Pearlitic		230	21	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎	◎	◎
	22		Curable	Hardened	100		◎	◎	◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎	◎	◎
	25		> 12% Si, Not Curable		130		◎	◎	◎	◎
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	◎	◎	◎
	27		CuZn, CuSnZn (Brass)		90		◎	◎	◎	◎
	28		CuSn, lead-free copper and electrolytic copper		100		◎	◎	◎	◎
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				◎	◎	◎	◎
	30		Rubber, Wood, etc.				◎	◎	◎	◎
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○
	32			Cured	280	30	○	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○	○
	34			Cured	350	38	○	○	○	○
	35			Cast	320	34	○	○	○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	○	○
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

THREAD MILL

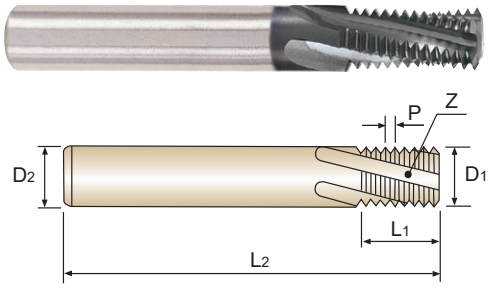
L1211 SERIES

M Solid Carbide Thread Mill for ISO Metric Internal Thread - DIN 13

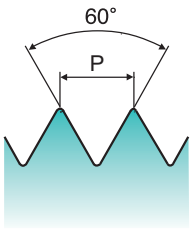
VOLLHARTMETALL GEWINDEFRÄSER für ISO METRISCHES INNENGEWINDE - DIN 13
FRAISES A FILETER CARBURE MONOBLOC POUR FILETAGE ISO INTER MÉTRIQUE - DIN13
Filettature interne, ISO metriche, passo grosso - DIN 13

▶ Easy to cut threads even for exotic materials like Nickel, Titanium and their alloys.

▶ Problemloses Gewindeschneiden sogar in exotischen Werkstoffen, wie Nickel, Titan und ihre Legierungen.



Thread Depth
2×D



Material groups **MU** | CARBIDE | DIN 6535HA | 60° | R15 | TiAlN | p.B54

Unit : mm

EDP No.	Nominal Diameter [D]	Pitch	Cutter Diameter	Shank Diameter	Thread Length	Overall Length	No. of Flute
TiAlN		P	D1	D2	L1	L2	Z
L1211200	M3	0.5	**2.2**	6	5	57	3
L1211240	M4	0.7	**2.9**	6	7	57	3
L1211280	M5	0.8	**3.8**	6	8	57	3
L1211310	M6	1.0	**4.5**	6	13	57	3
L1211360	M8	1.25	**6.0**	6	17.5	65	3
L1211420	M10	1.5	**7.5**	8	21	72	4
L1211500	M12	1.75	**9.5**	10	26.25	80	4
L1211540	M14	2.0	**10.0**	10	30	83	4
L1211600	M16	2.0	**12.0**	12	34	92	4
L1211650	M18	2.5	**14.0**	14	37.5	92	5
L1211700	M20	2.5	**16.0**	16	42.5	105	5

▶ Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○				

THREAD MILL

L1213 SERIES

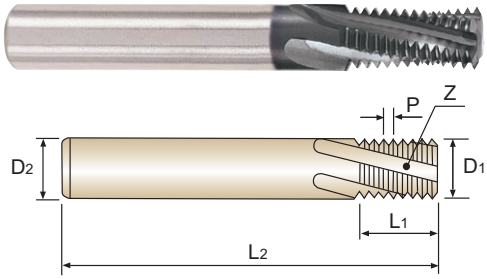
UNC

Solid Carbide Thread Mill for UNC Internal Thread - ANSI B 1.1

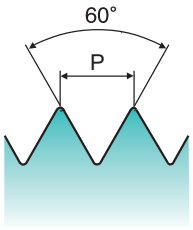
VOLLHARTMETALL GEWINDEFRÄSER für UNC INNENGEWINDE, ANSI B 1.1
FRAISES A FILETER CARBURE MONOBLOC POUR FILETAGE INTER UNC - ANSI B 1.1
Filettature interne, unificato, passo grosso - ANSI B 1.1

▶ Easy to cut threads even for exotic materials like Nickel, Titanium and their alloys.

▶ Problemloses Gewindeschneiden sogar in exotischen Werkstoffen, wie Nickel, Titan und ihre Legierungen.



Thread Depth
2×D



Material groups **MU** | CARBIDE | DIN 6535HA | 60° | R15 | TiAlN

p.B54

Unit : mm

EDP No.	Nominal Diameter [D]	TPI	Cutter Diameter	Shank Diameter	Thread Length	Overall Length	No. of Flute
TiAlN			D_1	D_2	L_1	L_2	Z
L1213400	1/4	20	**4.5**	6	14	57	3
L1213440	5/16	18	**5.8**	6	16.9	65	3
L1213480	3/8	16	**7.0**	8	20.6	72	4
L1213520	7/16	14	**8.0**	8	23.6	72	4
L1213560	1/2	13	**9.5**	10	27.4	80	4
L1213600	9/16	12	**10.0**	10	31.8	83	4
L1213640	5/8	11	**12.0**	12	34.6	92	4
L1213700	3/4	10	**14.0**	14	40.6	104	5

▶ Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○				

THREAD MILL

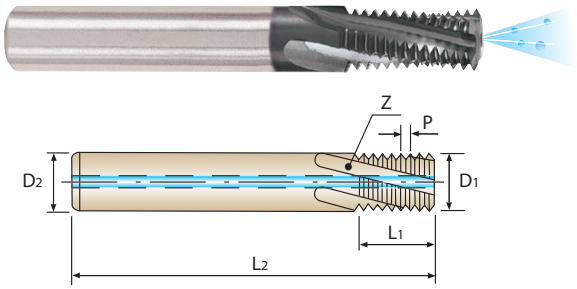
L4211 SERIES

M Solid Carbide Thread Mill with Coolant Hole for ISO Metric Internal Thread - DIN 13

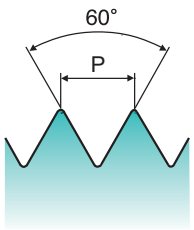
VOLLHARTMETALL GEWINDEFRÄSER mit KÜHLKANAL für ISO METRISCHES INNENGEWINDE - DIN 13
FRAISES A FILETER CARBURE MONOBLOC AVEC ARROSAGE CENTRAL POUR FILETAGE ISO INTER MÉTRIQUE - DIN13
Con fori di lubrificazione, Filettature interne, ISO metriche, passo grosso - DIN 13

▶ Easy to cut threads even for exotic materials like Nickel, Titanium and their alloys.

▶ Problemloses Gewindeschneiden sogar in exotischen Werkstoffen, wie Nickel, Titan und ihre Legierungen.



Thread Depth
2×D



Material groups **MU** | CARBIDE | DIN 6535HA | 60° | R15 | TiAlN

p.B54

Unit : mm

EDP No.	Nominal Diameter [D]	Pitch	Cutter Diameter	Shank Diameter	Thread Length	Overall Length	No. of Flute
TiAlN		P	D1	D2	L1	L2	Z
L4211310	M6	1.0	**4.5**	6	13.0	57	3
L4211360	M8	1.25	**6.0**	6	17.5	65	3
L4211420	M10	1.5	**7.5**	8	21.0	72	4
L4211500	M12	1.75	**9.5**	10	26.25	80	4
L4211540	M14	2.0	**10.0**	10	30.0	83	4
L4211600	M16	2.0	**12.0**	12	34.0	92	4

▶ Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○				

THREAD MILL

L6215 SERIES

BSP(G)

Solid Carbide Thread Mill with Coolant Hole for BSP(G) Internal/External Thread

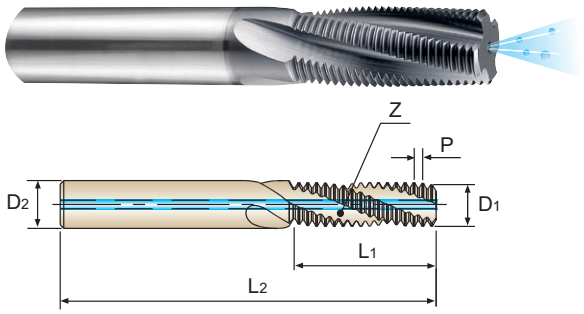
VOLLHARTMETALL GEWINDEFRÄSER mit KÜHLKANAL für BSP (G) INNEN- /AUSSENGEWINDE

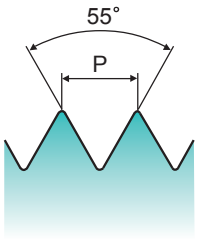
FRAISES A FILETER CARBURE MONOBLOC AVEC ARROSAGE CENTRAL POUR FILETAGE INTERNE/EXTERNE BSP(G)

Fresa con fori di lubrificazione, filettature interne ed esterne, BSP(G)

▶ Easy to cut threads even for exotic materials like Nickel, Titanium and their alloys.

▶ Problemloses Gewindeschneiden sogar in exotischen Werkstoffen, wie Nickel, Titan und ihre Legierungen.





Material groups **MU** | CARBIDE | DIN 6535HA | 55° | R15 | TiAlN

p.B54

Unit : mm

EDP No.	Nominal Diameter [D]	TPI	Cutter Diameter	Shank Diameter	Thread Length	Overall Length	No. of Flute
TiAlN			D1	D2	L1	L2	Z
L6215020	1/16	28	**5.9**	6	16.3	65	3
L6215200	1/8	28	**7.9**	8	20.0	70	4
L6215400	1/4	19	**9.9**	10	26.7	80	4
L6215560	1/2	14	**15.9**	16	43.5	104	5
L6215700	3/4	14	**17.9**	18	34.5	100	5
L6215780	1	11	**19.9**	20	34.6	100	5

▶ Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○				

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

THREAD MILL

L4272 SERIES

MF

Solid Carbide Thread Mill with Coolant Hole & Chamfer for ISO Metric Internal Thread - DIN 13

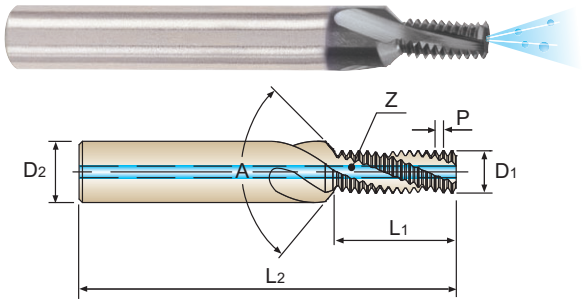
VOLLHARTMETALL GEWINDEFRÄSER mit KÜHLKANAL & FASE für METRISCH - FEIN INNENGEWINDE - DIN 13

FRAISES A FILETER CARBURE MONOBLOC AVEC ARROSAGE CENTRAL ET CHANFREIN POUR FILETAGE ISO INTER MÉTRIQUE DIN13

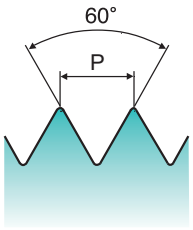
Con fori di lubrificazione e taglienti per smussi, filettature interne, ISO metriche, passo fine - DIN 13

▶ Easy to cut threads even for exotic materials like Nickel, Titanium and their alloys.

▶ Problemloses Gewindeschneiden sogar in exotischen Werkstoffen, wie Nickel, Titan und ihre Legierungen.



Thread Depth
1.5×D



Material groups **MU** | CARBIDE | DIN 6535HA | 60° | R15 | TiAlN

p.B54

Unit : mm

EDP No.	Nominal Diameter [D]	Pitch	Cutter Diameter	Shank Diameter	Thread Length	Overall Length	Angle	No. of Flute
TiAlN		P	D1	D2	L1	L2	A	Z
L4272370	M8	1.0	**6.7**	10	12.4	74	90°	3
L4272430	M10	1.25	**8.3**	12	15.9	80	90°	4
L4272440	M10	1.0	**8.7**	12	15.4	80	90°	4
L4272510	M12	1.5	**10.0**	14	18.65	90	90°	4
L4272520	M12	1.25	**10.3**	14	18.3	80	90°	4
L4272530	M12	1.0	**10.7**	14	18.4	90	90°	4
L4272550	M14	1.5	**12.0**	16	21.65	100	90°	4
L4272610	M16	1.5	**14.0**	18	24.65	102	90°	5

▶ Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○				

THREAD MILL

L4274 SERIES

UNF

Solid Carbide Thread Mill with Coolant Hole & Chamfer for UNF Internal Thread - ANSI B 1.1

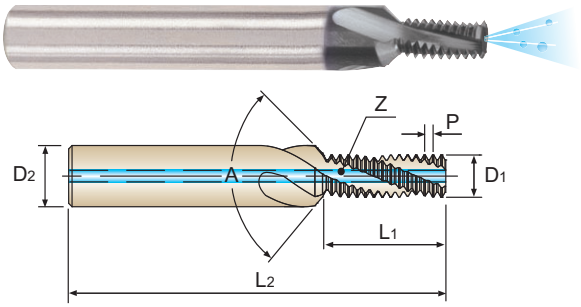
VOLLHARTMETALL GEWINDEFRÄSER mit KÜHLKANAL & FASE für UNF INNENGEWINDE - ANSI B 1.1

FRAISES A FILETER CARBURE MONOBLOC AVEC ARROSAGE CENTRAL ET CHANFREIN POUR FILETAGE INTER UNC - ANSI B 1.1

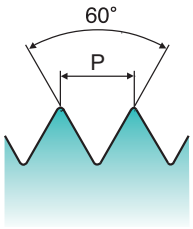
Con fori di lubrificazione e taglienti per smussi, filettature interne, unificato, passo fine - ANSI B 1.1

▶ Easy to cut threads even for exotic materials like Nickel, Titanium and their alloys.

▶ Problemloses Gewindeschneiden sogar in exotischen Werkstoffen, wie Nickel, Titan und ihre Legierungen.



Thread Depth
2×D



Material groups **MU** | CARBIDE | DIN 6535HA | 60° | R15 | TiAlN

p.B55

Unit : mm

EDP No.	Nominal Diameter [D]	TPI	Cutter Diameter	Shank Diameter	Thread Length	Overall Length	Angle	No. of Flute
TiAlN			D1	D2	L1	L2	A	Z
L4274420	1/4	28	**5.1**	8	13.21	62	90°	3
L4274460	5/16	24	**6.5**	10	16.37	74	90°	3
L4274500	3/8	24	**8.1**	12	19.54	80	90°	4
L4274540	7/16	20	**9.4**	12	22.19	80	90°	4
L4274580	1/2	20	**11.0**	14	26	90	90°	4
L4274620	9/16	18	**12.4**	16	28.88	100	90°	4
L4274660	5/8	18	**14.0**	18	33.12	102	90°	5
L4274720	3/4	16	**17.0**	20	38.86	110	90°	5

▶ Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○				

THREAD MILL

L12D1 SERIES

M Solid Carbide Miniature Thread Mill for ISO Metric Internal Thread - DIN 13

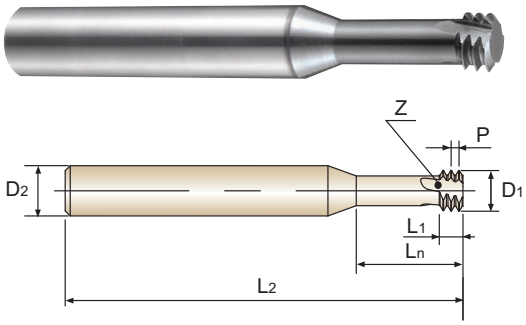
VOLLHARTMETALL MINI-GEWINDEFRÄSER für ISO METRISCHE INNENGEWINDE - DIN 13

FRAISES A FILETER À TOURBILLONNER CARBURE MONOBLOC POUR FILETAGE ISO INTER MÉTRIQUE - DIN13

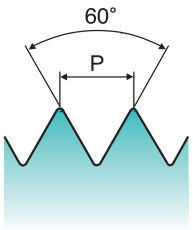
Mini frese per filettature interne ISO metriche passo grosso - DIN 13

▶ Short thread length

▶ Kurze Gewindelänge



Thread Depth
2×D



Material groups MU | CARBIDE | DIN 6535HA | 60° | R15 | TiAlN

p.B55

Unit : mm

EDP No.	Nominal Diameter [D]	Pitch	Cutter Diameter	Shank Diameter	Thread Length	Neck Length	Overall Length	No. of Flute
TiAlN		P	D1	D2	L1	Ln	L2	Z
L12D1010	M1	0.25	**0.70**	3	0.75	2.1	30	3
L12D1050	M1.2	0.25	**0.90**	3	0.75	2.5	30	3
L12D1070	M1.4	0.3	**1.04**	3	0.90	2.9	30	3
L12D1090	M1.6	0.35	**1.18**	3	1.05	3.4	30	3
L12D1150	M2.2	0.45	**1.66**	6	1.35	4.6	57	3
L12D1170	M2.5	0.45	**1.96**	6	1.35	5.3	57	3
L12D1200	M3	0.5	**2.4**	6	1.5	6.3	57	3
L12D1240	M4	0.7	**3.16**	6	2.1	8.4	57	3
L12D1280	M5	0.8	**4.04**	6	2.4	10.5	57	3
L12D1310	M6	1.0	**4.8**	6	3.0	12.6	57	3
L12D1360	M8	1.25	**6.5**	8	3.75	16.8	63	3
L12D1420	M10	1.5	**8.2**	10	4.5	21.0	73	3
L12D1500	M12	1.75	**9.9**	10	5.25	25.2	73	3

▶ Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○				

THREAD MILL

L19E1 SERIES

M Solid Carbide Miniature Thread Mill for Hard Materials, ISO Metric Internal Thread - DIN 13

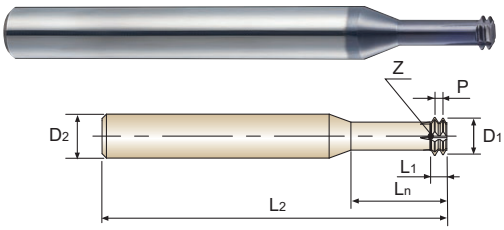
VOLLHARTMETALL MINI-GEWINDEFRÄSER für GEHÄRTETE MATERIALIEN, ISO METRISCHE INNENGEWINDE - DIN 13

FRAISES À TOURBILLONNER CARBURE MONOBLOC POUR MATÉRIAUX DURS, FILETAGE ISO INTER MÉTRIQUE - DIN13

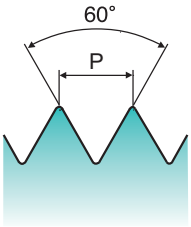
Mini frese per acciai temprati ISO metriche passo grosso - DIN 13

- Left hand Cut (CNC code : M04)
- Short thread length
- Straight Flute
- The work direction is from top to bottom (Climb Milling)
- For hard materials up to HRc62

- Linksschneidend (CNC Befehl : M04)
- Kurze Gewindelänge
- Linksschneidend, geradegenutet
- Die Fräsrichtung ist von oben nach unten (Gleichlauf)
- Für gehärtete Materialien bis zu HRc62



Thread Depth
2×D



Material groups **HR** | CARBIDE | DIN 6535HA | 60° | AlTiN | p.B55

Unit : mm

EDP No.	Nominal Diameter [D]	Pitch	Cutter Diameter	Shank Diameter	Thread Length	Neck Length	Overall Length	No. of Flute
AlTiN		P	D1	D2	L1	Ln	L2	Z
L19E1130	M2	0.4	1.52	6	0.8	4.2	57	4
L19E1150	M2.2	0.45	1.66	6	0.9	4.6	57	4
L19E1170	M2.5	0.45	1.96	6	0.9	5.3	57	4
L19E1200	M3	0.5	2.4	6	1.0	6.3	57	4
L19E1240	M4	0.7	3.16	6	1.4	8.4	57	4
L19E1280	M5	0.8	4.04	6	1.6	10.5	57	4
L19E1310	M6	1.0	4.8	6	2.0	12.6	57	5
L19E1360	M8	1.25	6.5	8	2.5	16.8	63	5
L19E1420	M10	1.5	8.2	10	3.0	21.0	73	6
L19E1500	M12	1.75	9.9	10	3.5	25.2	73	6

- Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎	○	○	◎	◎	◎	◎

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THREAD MILL

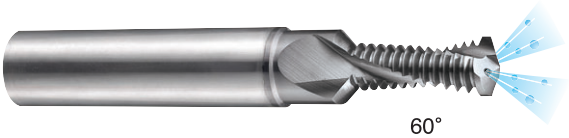
UNCOATED **L41A1** SERIES
TiAlN **L42A1** SERIES

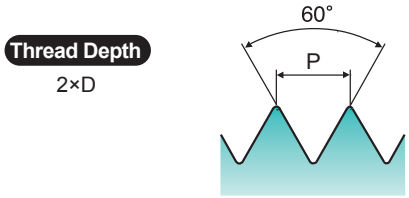
M Solid Carbide Drill and Thread Mill with Chamfer for ISO Metric Internal Thread - DIN 13

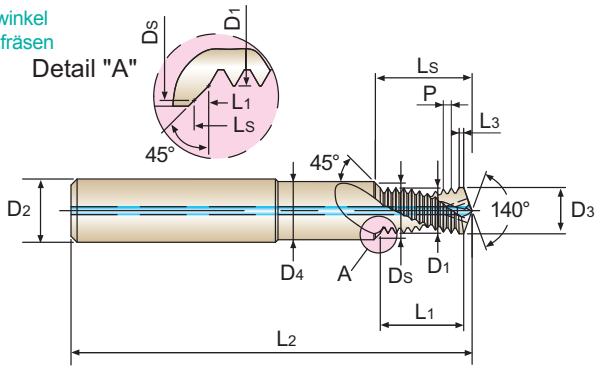
VOLLHARTMETALL BOHRGEWINDEFRÄSER MIT SENKFASE für ISO METRISCHE INNENGEWINDE - DIN 13
FRAISES À FILETER ET À PERCER CARBURE MONOBLOC AVEC CHANFREIN POUR FILETAGE INTER - DIN13
Fresa fora, filetta e smussa , filettature interne, ISO metriche passo grosso - DIN 13

- No. of Flute : 2
- Drill Point : 140° / Countersink : 90°
- Drilling, Chamfering and Thread milling

- Anz. der Nuten : 2
- 140° Spitzenwinkel, 90° Senkwinkel
- Bohren, Senken und Gewindefräsen







Material groups GG | Material groups Al | CARBIDE | DIN 6535HA | 60° | R25 | Bright TiAlN

p.B55

Unit : mm

EDP No.		Nominal Diameter [D]	Pitch	Cutter Diameter	Shank Diameter	Effect. Diameter	Drill Diameter	Max. C'sink	Thread Length	Effect. Length	Drill Length	Overall Length
Bright	TiAlN		P	D1	D2	Ds	D3	D4	L1	Ls	L3	L2
L41A1310	L42A1310	M6	1.0	4.75	8	6.3	5.00	6.6	13.00	14.68	1.00	62
L41A1420	L42A1420	M10	1.5	7.95	12	10.3	8.50	11.0	21.05	23.77	1.50	79
L41A1500	L42A1500	M12	1.75	9.95	14	12.3	10.25	13.5	24.21	27.25	1.50	89
L41A1540	L42A1540	M14	2.0	11.20	16	14.3	12.00	15.5	29.58	33.32	1.50	102

▶ Other coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended															◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎											

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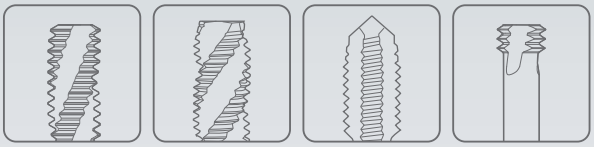
THREAD MILL

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

					L1211	L1212	L1213	L1214	L4211	L4212	L6215	L4271	L4272
ISO	VDI 3323	Material Description	HB	HRc	Vc (m/min.)								
P	1	Non-alloy steel	125		80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	2		190	13	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	3		250	25	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	4		270	28	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	5		300	32	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	6	Low alloy steel	180	10	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	7		275	29	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	8		300	32	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	9		350	38	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	10	High alloyed steel, and tool steel	200	15	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
	11		325	35	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120	80-120
M	12	Stainless steel	200	15	40-80	40-80	40-80	40-80	40-80	40-80	40-80	40-80	40-80
	13		240	23	40-80	40-80	40-80	40-80	40-80	40-80	40-80	40-80	40-80
	14		180	10	40-80	40-80	40-80	40-80	40-80	40-80	40-80	40-80	40-80
K	15	Grey cast iron	180	10	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100
	16		260	26	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100
	17	Nodular cast iron	160	3	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100
	18		250	25	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100
	19	Malleable cast iron	130		50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100
	20		230	21	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100	50-100
N	21	Aluminum-wrought alloy	60		100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	22		100		100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	23	Aluminum-cast, alloyed	75		100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	24		90		100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	25		130		100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	26	Copper and Copper Alloys (Bronze / Brass)	110		100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	27		90		100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	28		100		100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	29	Non Metallic Materials			100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
	30				100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300	100-300
S	31	Heat Resistant Super Alloys	200	15	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60
	32		280	30	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60
	33		250	25	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60
	34		350	38	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60
	35		320	34	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60
	36	Titanium Alloys	400 Rm		20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60
	37		1050 Rm		20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60	20-60
H	38	Hardened steel	550	55						25-60	25-60		
	39		630	60						25-50	25-50		
	40	Chilled Cast Iron	400	42						25-70	25-70		
	41	Hardened Cast Iron	550	55						25-60	25-60		

Global Cutting Tool Leader **YG-1**



THREADING

YG

Leading Through Innovation

SYNCHRO TAP

Synchro Gewindebohrer

- **For High Speed Tapping on Rigid CNC Machine**
- **Für Hochgeschwindigkeits-Gewindebohren auf starren CNC-Maschinen**

SELECTION GUIDE

YG THREADING TOOLS

HSS-PM SYNCHRO TAP

For High Speed Tapping on Rigid CNC Machine

HOLE TYPE			Max. 2.5xD Blind Hole		Max. 3.0xD Through Hole	
TOOL MATERIAL			HSS-PM			
CHAMFER LEAD ACC. TO DIN2197			C		B	
FLUTE TYPE			Spiral Flute		Spiral Point	
SPIRAL FLUTE ANGLE			R45		-	
SERIES	M	DIN371/376	TTS31 (p.B60)		TTS33 (p.B62)	
		DIN352				
		DIN357/LONG				
	MF	DIN374		TTS32 (p.B61)		TTS34 (p.B63)
		DIN2181				
	UNC	DIN371/376				
		DIN351				
	UNF	DIN371/374				
		DIN2181				
	BSW	DIN2182/2183				
		DIN351				
	G (BSP)	DIN5156/5157				
	EG-M	DIN371/376				
	EG-UNC	DIN371/376				
	EG-UNF	DIN371/374				
SURFACE TREATMENT			TiN		TiN	
MODEL						

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B74

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32				
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32				
	9			Quenched & Tempered	350	38				
	10	High alloyed steel, and tool steel		Annealed	200	15				
	11			Quenched & Tempered	325	35				
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎
	14		Austenitic		180	10	○	○	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	○
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎	◎	◎
	25		> 12% Si, Not Curable		130		◎	◎	◎	◎
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	◎	◎	◎
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

SYNCHRO TAP

TTS31 SERIES

M ISO Metric Coarse Threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

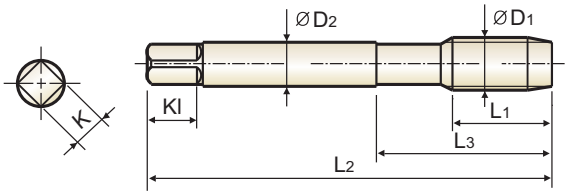
Machine taps
Maschinengewindebohrer

- Coated HSS-PM (Powder Metallurgy) Taps for high-speed tapping on rigid CNC machines or equivalent machines
- Up to 3 times faster in tapping compared to conventional taps
- For high-speed synchro tapping, synchro holder for increasing tool life and thread quality is recommended
- High precision threads

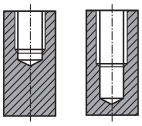
- Beschichtete HSS-PM-Gewindebohrer zum Hochgeschwindigkeitsgewindebohren auf starren CNC-Maschinen oder gleichwertige Maschinen
- Bis zu dreimal schnelleres Gewindeschneiden als bei herkömmlichen Gewindebohrern
- Beim Hochgeschwindigkeits-Gewindebohren wird die Verwendung eines Synchrofutters zur Erhöhung der Werkzeugstandzeit und der Gewindequalität empfohlen
- Hoch präzise Gewinde

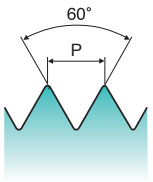
DIN 371

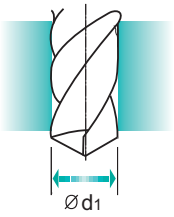
DIN 376



Hole type
2.5×D







Material groups **GS** | HSS PM | DIN 371/376 | 6HX | 60° | C | R45 | TiN

p.B74

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	**TTS31206**	6	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	**TTS31246**	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	**TTS31286**	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	**TTS31316**	10	80	30	6	4.9	8	3	5.0
M8	× 1.25	**TTS31366**	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	**TTS31426**	15	100	39	10	8	11	3	8.5
M12	× 1.75	**TTS31506**	18	110	44	9	7	10	3	10.2
M14	× 2.0	**TTS31546**	20	110	44	11	9	12	3	12.0
M16	× 2.0	**TTS31606**	20	110	44	12	9	12	3	14.0
M18	× 2.5	**TTS31656**	25	125	50	14	11	14	4	15.5
M20	× 2.5	**TTS31706**	25	140	54	16	12	15	4	17.5

- DIN 371 (M3-M10) and DIN 376 (M12-M20)
- Coating (TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎					◎	◎	○	○		◎			

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

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YG-1 CO., LTD.

SYNCHRO TAP

TTS33 SERIES

M ISO Metric Coarse Threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

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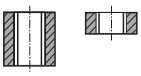
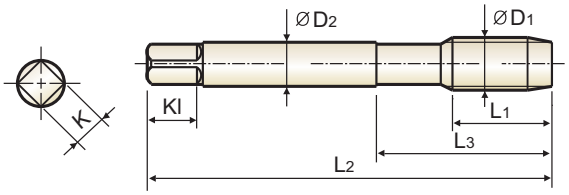
- Hoch präzise Gewinde

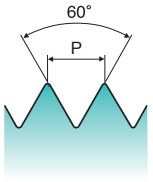
DIN 371

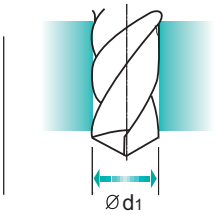
DIN 376

Hole type
3.0×D









Material groups **GS** | HSS PM | DIN 371/376 | 6HX | 60° | B | TiN | p.B74

Recommended ToolHolder: Plain Shank — SYNCHRO TAPPING CHUCK

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	**TTS33206**	5	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	**TTS33246**	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	**TTS33286**	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	**TTS33316**	10	80	30	6	4.9	8	3	5
M8	× 1.25	**TTS33366**	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	**TTS33426**	15	100	39	10	8	11	3	8.5
M12	× 1.75	**TTS33506**	18	110	44	9	7	10	4	10.2
M14	× 2.0	**TTS33546**	20	110	44	11	9	12	4	12
M16	× 2.0	**TTS33606**	20	110	44	12	9	12	4	14
M18	× 2.5	**TTS33656**	25	125	50	14	11	14	4	15.5
M20	× 2.5	**TTS33706**	25	140	54	16	12	15	4	17.5

- DIN 371 (M3-M10) and DIN 376 (M12-M20)
- Coating (TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎					◎	◎	○	○		◎			

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

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SYNCHRO TAP

TKS35 SERIES

M ISO Metric Coarse Threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

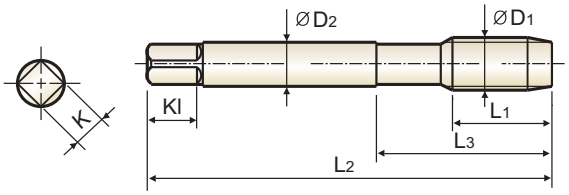
Machine taps
Maschinengewindebohrer

- Coated HSS-PM (Powder Metallurgy) Taps for high-speed tapping on rigid CNC machines or equivalent machines
- Up to 3 times faster in tapping compared to conventional taps
- For high-speed synchro tapping, synchro holder for increasing tool life and thread quality is recommended
- High precision threads

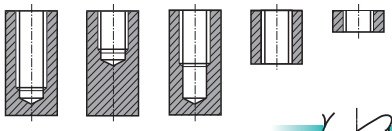
- Beschichtete HSS-PM-Gewindebohrer zum Hochgeschwindigkeitsgewindebohren auf starren CNC-Maschinen oder gleichwertige Maschinen
- Bis zu dreimal schnelleres Gewindeschneiden als bei herkömmlichen Gewindebohrern
- Beim Hochgeschwindigkeits-Gewindebohren wird die Verwendung eines Synchrofutters zur Erhöhung der Werkzeugstandzeit und der Gewindequalität empfohlen
- Hoch präzise Gewinde

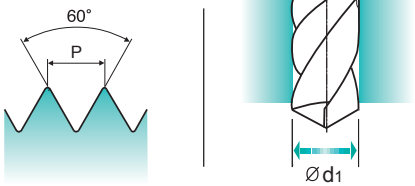
DIN 371

DIN 376



Hole type
2.0×D





Material groups **GG**

HSS PM | DIN 371/376 | 6HX | 60° | C | TiCN

p.B74

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiCN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	**TKS35206**	5	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	**TKS35246**	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	**TKS35286**	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	**TKS35316**	10	80	30	6	4.9	8	3	5.0
M8	× 1.25	**TKS35366**	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	**TKS35426**	15	100	39	10	8	11	4	8.5
M12	× 1.75	**TKS35506**	18	110	44	9	7	10	4	10.2
M14	× 2.0	**TKS35546**	20	110	44	11	9	12	4	12.0
M16	× 2.0	**TKS35606**	20	110	44	12	9	12	4	14.0
M18	× 2.5	**TKS35656**	25	125	50	14	11	14	4	15.5
M20	× 2.5	**TKS35706**	25	140	54	16	12	15	4	17.5

- DIN 371 (M3-M10) and DIN 376 (M12-M20)
- Coating (TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○								◎	◎	◎	◎	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended			○	○	○																

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YG-1 CO., LTD.

SYNCHRO TAP

TTS37 SERIES

M ISO Metric Coarse Threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

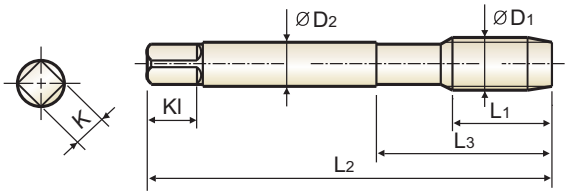
Machine taps
Maschinengewindebohrer

- Coated HSS-PM (Powder Metallurgy) Taps for high-speed tapping on rigid CNC machines or equivalent machines
- Up to 3 times faster in tapping compared to conventional taps
- For high-speed synchro tapping, synchro holder for increasing tool life and thread quality is recommended
- High precision threads

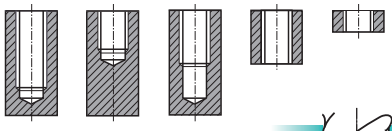
- Beschichtete HSS-PM-Gewindebohrer zum Hochgeschwindigkeitsgewindebohren auf starren CNC-Maschinen oder gleichwertige Maschinen
- Bis zu dreimal schnelleres Gewindeschneiden als bei herkömmlichen Gewindebohrern
- Beim Hochgeschwindigkeits-Gewindebohren wird die Verwendung eines Synchrofutters zur Erhöhung der Werkzeugstandzeit und der Gewindequalität empfohlen
- Hoch präzise Gewinde

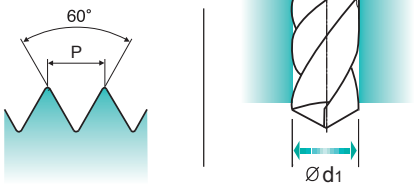
DIN 371

DIN 376



Hole type
3.0×D





Material groups **GV** | HSS PM | DIN 371/376 | 6HX | 60° | C | TiN

p.B74

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	Number of Oil Groove	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	**TTS37206**	5	56	18	3.5	2.7	6	5	2.8
M5	× 0.8	**TTS37286**	8	70	25	6	4.9	8	5	4.65
M6	× 1.0	**TTS37316**	10	80	30	6	4.9	8	5	5.55
M8	× 1.25	**TTS37366**	13	90	35	8	6.2	9	6	7.4
M10	× 1.5	**TTS37426**	15	100	39	10	8	11	6	9.3
M12	× 1.75	**TTS37506**	18	110	44	9	7	10	6	11.2
M14	× 2.0	**TTS37546**	20	110	44	11	9	12	8	13.0
M16	× 2.0	**TTS37606**	20	110	44	12	9	12	8	15.0
M18	× 2.5	**TTS37656**	25	125	50	14	11	14	8	16.8
M20	× 2.5	**TTS37706**	25	140	54	16	12	15	8	18.8

- DIN 371 (M3-M10) and DIN 376 (M12-M20)
- Coating (TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎					◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	◎	◎	○			◎													

SYNCHRO TAP

TTS39 SERIES

M ISO Metric Coarse Threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

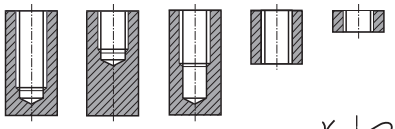
- Coated HSS-PM (Powder Metallurgy) Taps for high-speed tapping on rigid CNC machines or equivalent machines
- Up to 3 times faster in tapping compared to conventional taps
- For high-speed synchro tapping, synchro holder for increasing tool life and thread quality is recommended
- High precision threads

- Beschichtete HSS-PM-Gewindebohrer zum Hochgeschwindigkeitsgewindebohren auf starren CNC-Maschinen oder gleichwertige Maschinen
- Bis zu dreimal schnelleres Gewindeschneiden als bei herkömmlichen Gewindebohrern
- Beim Hochgeschwindigkeits-Gewindebohren wird die Verwendung eines Synchrofutters zur Erhöhung der Werkzeugstandzeit und der Gewindequalität empfohlen
- Hoch präzise Gewinde

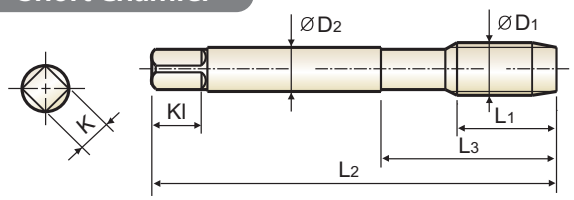
DIN 371

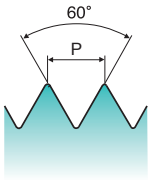
DIN 376

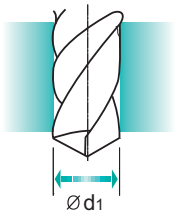
Hole type
3.0×D



Short Chamfer







Material groups **GV** | HSS PM | DIN 371/376 | 6HX | 60° | E | TiN

p.B74

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	Number of Oil Groove	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	TTS39206	5	56	18	3.5	2.7	6	5	2.8
M4	× 0.7	TTS39246	7	63	21	4	3.4	6	5	3.7
M5	× 0.8	TTS39286	8	70	25	6	4.9	8	5	4.65
M6	× 1.0	TTS39316	10	80	30	6	4.9	8	5	5.55
M8	× 1.25	TTS39366	13	90	35	8	6.2	9	6	7.4
M10	× 1.5	TTS39426	15	100	39	10	8	11	6	9.3
M12	× 1.75	TTS39506	18	110	44	9	7	10	6	11.2
M14	× 2.0	TTS39546	20	110	44	11	9	12	8	13.0
M16	× 2.0	TTS39606	20	110	44	12	9	12	8	15.0
M18	× 2.5	TTS39656	25	125	50	14	11	14	8	16.8
M20	× 2.5	TTS39706	25	140	54	16	12	15	8	18.8

- DIN 371 (M3-M10) and DIN 376 (M12-M20)
- Coating (TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎					◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	◎	◎	○			◎													

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YG-1 CO., LTD.

SYNCHRO TAP

TTS42-RCP SERIES

M ISO Metric Coarse Threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

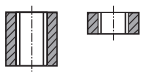
- Coated HSS-PM (Powder Metallurgy) Taps for high-speed tapping on rigid CNC machines or equivalent machines
- Up to 3 times faster in tapping compared to conventional taps
- For high-speed synchro tapping, synchro holder for increasing tool life and thread quality is recommended
- High precision threads

- Beschichtete HSS-PM-Gewindebohrer zum Hochgeschwindigkeitsgewindebohren auf starren CNC-Maschinen oder gleichwertige Maschinen
- Bis zu dreimal schnelleres Gewindeschneiden als bei herkömmlichen Gewindebohrern
- Beim Hochgeschwindigkeits-Gewindebohren wird die Verwendung eines Synchrofutters zur Erhöhung der Werkzeugstandzeit und der Gewindequalität empfohlen
- Hoch präzise Gewinde

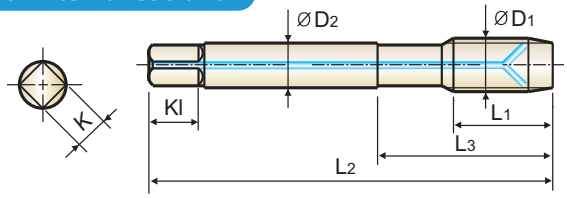
DIN 371

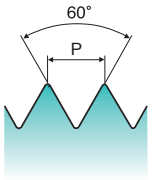
DIN 376

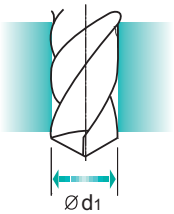
Hole type
3.0×D



with Internal Coolant







Material groups **GS** | HSS PM | DIN 371/376 | 6HX | 60° | B | TiN

p.B74

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M6	× 1.0	**TTS42316RCP**	10	80	30	6	4.9	8	3	5.0
M8	× 1.25	**TTS42366RCP**	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	**TTS42426RCP**	15	100	39	10	8	11	3	8.5
M12	× 1.75	**TTS42506RCP**	18	110	44	9	7	10	4	10.2
M14	× 2.0	**TTS42546RCP**	20	110	52	11	9	12	4	12.0
M16	× 2.0	**TTS42606RCP**	20	110	52	12	9	12	4	14.0
M18	× 2.5	**TTS42656RCP**	25	125	66	14	11	14	4	15.5
M20	× 2.5	**TTS42706RCP**	25	140	72	16	12	15	4	17.5

- DIN 371 (M6-M10) and DIN 376 (M12-M20)
- Coating (TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎		◎	◎					◎	◎	○	○		◎			

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended			◎	◎	◎	◎		○													

SYNCHRO TAP

TKS44-RCP SERIES

M ISO Metric Coarse Threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

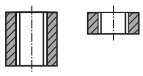
Machine taps
Maschinengewindebohrer

- Coated HSS-PM (Powder Metallurgy) Taps for high-speed tapping on rigid CNC machines or equivalent machines
- Up to 3 times faster in tapping compared to conventional taps
- For high-speed synchro tapping, synchro holder for increasing tool life and thread quality is recommended
- High precision threads

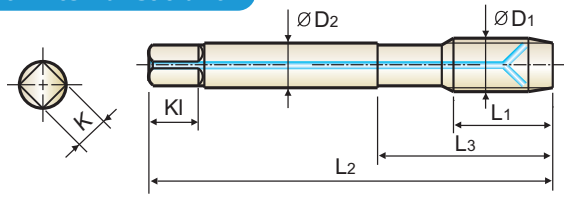
DIN 371

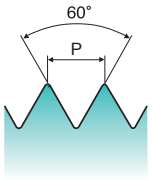
DIN 376

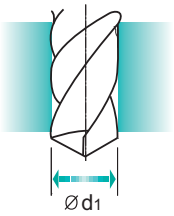
Hole type
2.0×D



with Internal Coolant







Material groups **GG**

HSS PM | DIN 371/376 | 6HX | 60° | C | TiCN

p.B74

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiCN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M6	× 1.0	TKS44316RCP	10	80	30	6	4.9	8	3	5.0
M8	× 1.25	TKS44366RCP	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TKS44426RCP	15	100	39	10	8	11	4	8.5
M12	× 1.75	TKS44506RCP	18	110	44	9	7	10	4	10.2
M14	× 2.0	TKS44546RCP	20	110	52	11	9	12	4	12.0
M16	× 2.0	TKS44606RCP	20	110	52	12	9	12	4	14.0
M18	× 2.5	TKS44656RCP	25	125	66	14	11	14	4	15.5
M20	× 2.5	TKS44706RCP	25	140	72	16	12	15	4	17.5

- DIN 371 (M6-M10) and DIN 376 (M12-M20)
- Coating (TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○								◎	◎	◎	◎	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			○	○	○																

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YG-1 CO., LTD.

SYNCHRO TAP

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

					TTS31,TTS32	TTS33,TTS34	TKS35,TKS36	TTS37,TTS38	TTS39
ISO	VDI 3323	Material Description	HB	HRc	Vc (m/min.)				
P	1	Non-alloy steel	125		41-46	41-46	41-46	41-46	30-35
	2		190	13	41-46	41-46	41-46	41-46	41-46
	3		250	25	35-40	35-40	35-40	35-40	35-40
	4		270	28	28-33	28-33	28-33	28-33	28-33
	5		300	32					
	6	Low alloy steel	180	10	28-33	28-33	28-33	28-33	28-33
	7		275	29	28-33	28-33	28-33	28-33	28-33
M	12	Stainless steel	200	15	18-23	18-23		18-23	18-23
	13		240	23	13-18	13-18		13-18	13-18
	14		180	10	10-14	10-14		10-14	10-14
K	15	Grey cast iron	180	10	28-33	28-33	28-33		
	16		260	26			28-33		
	17	Nodular cast iron	160	3	28-33	28-33	28-33		
	18		250	25			28-33		
	19	Malleable cast iron	130				28-33		
	20		230	21			28-33		
N	21	Aluminum-wrought alloy	60					28-33	28-33
	22		100					28-33	28-33
	23	Aluminum-cast, alloyed	75		41-46	41-46	30-35	41-46	41-46
	24		90		41-46	41-46	30-35	41-46	41-46
	25		130		30-35	30-35	30-35	30-35	30-35
	26	Copper and Copper Alloys (Bronze / Brass)	110		45-50	45-50			
	27		90						
	28		100		25-30	25-30		25-30	25-30

					TTS41-IC	TTS42-RCP	TKS43-IC	TKS44-RCP	TTS45-RCP
ISO	VDI 3323	Material Description	HB	HRc	Vc (m/min.)				
P	1	Non-alloy steel	125		41-57	41-57	41-57	41-57	41-57
	2		190	13	41-57	41-57	41-57	41-57	41-57
	3		250	25	35-50	35-50	35-50	35-50	35-50
	4		270	28	28-41	28-41	28-41	28-41	28-41
	5		300	32					
	6	Low alloy steel	180	10	28-41	28-41	28-41	28-41	28-41
	7		275	29	28-41	28-41	28-41	28-41	28-41
M	12	Stainless steel	200	15	18-28	18-28			18-28
	13		240	23	13-22	13-22			13-22
	14		180	10	10-17	10-17			10-17
K	15	Grey cast iron	180	10	28-41	28-41	28-41	28-41	
	16		260	26			28-41	28-41	
	17	Nodular cast iron	160	3	28-41	28-41	28-41	28-41	
	18		250	25			28-41	28-41	
	19	Malleable cast iron	130				28-41	28-41	
	20		230	21			28-41	28-41	
N	21	Aluminum-wrought alloy	60						28-41
	22		100						28-41
	23	Aluminum-cast, alloyed	75		41-57	41-57	30-43	30-43	41-57
	24		90		41-57	41-57	30-43	30-43	41-57
	25		130		30-43	30-43	30-43	30-43	30-43
	26	Copper and Copper Alloys (Bronze / Brass)	110		45-62	45-62			
	27		90						
	28		100		25-37	25-37			25-37

Leading Through Innovation

PRIME TAP

PRIME GEWINDEBOHRER

- Premium Spiral Point and Spiral Flute Taps for CNC Machines
- High and Reliable Performance on Various Ductile Materials
- Premium Gerade- und Spiralgenutete Gewindebohrer
- Ausgezeichnete und zuverlässige Leistung in verschiedenen Werkstoffen

SELECTION GUIDE

YG THREADING TOOLS

HSS-PM
PRIME TAP

Premium Spiral Point and Spiral Flute Taps for CNC Machines
High and Reliable Performance on Various Ductile Materials

HOLE TYPE			Max. 2.5xD Blind Hole		Max. 3.0xD Through Hole
TOOL MATERIAL			HSS-PM		
CHAMFER LEAD ACC. TO DIN2197			C	E	B
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Point
SPIRAL FLUTE ANGLE			R45	R45	-
SERIES	M	DIN371/376	TRE30 (p.B77)	TRE34 (p.B78)	TRJ15 (p.B83)
		DIN352			
		DIN357/LONG			
	MF	DIN374	TRE31 (p.B79)		TRJ16 (p.B84)
		DIN2181			
	UNC	DIN371/376	TRE32 (p.B81)		TRJ17 (p.B86)
		DIN351			
	UNF	DIN371/374	TRE33 (p.B82)		TRJ18 (p.B87)
		DIN2181			
	BSW	DIN2182/2183			
		DIN351			
	G(BSP)	DIN5156/5157			
	EG-M	DIN371/376			
	EG-UNC	DIN371/376			
	EG-UNF	DIN371/374			
SURFACE TREATMENT			X-Coating		
MODEL					

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B88

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRC			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	○	○	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○
	11			Quenched & Tempered	325	35	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	◎
	16		Pearlitic (Martensitic)		260	26	○	○	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎
	19	Malleable cast iron	Ferritic		130				
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○
	22		Curable	Hardened	100		○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎	◎
	25		> 12% Si, Not Curable		130		○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	◎	◎
	27		CuZn, CuSnZn (Brass)		90		◎	◎	◎
	28		CuSn, lead-free copper and electrolytic copper		100		◎	◎	◎
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

PRIME TAP

TRE34 SERIES

M ISO Metric Coarse Threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

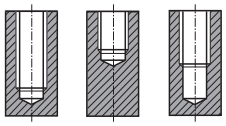
- ▶ High performance on various ductile materials
- ▶ Specially designed to prevent oversized threads and reduce gauging problems

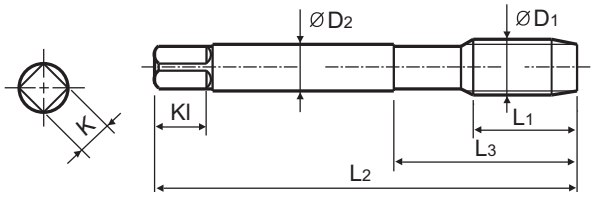
- ▶ Ausgezeichnete Leistung bei verschiedenen Werkstoffen.
- ▶ Speziell entwickelt, um zu gro ß e Gewindedurchmesser zu vermeiden und Messprobleme zu reduzieren.

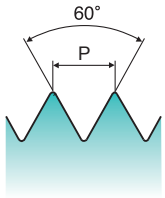
DIN 371

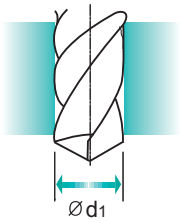
DIN 376

Hole type
2.5×D









Material groups **MU** | HSS PM | DIN 371/376 | 6HX | 60° | E | R45 | X Coating

p.B88

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	X-Coating	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2 x	0.4	TRE34136GS	3.2	45.0	13.0	2.8	2.1	5.0	2	1.6
M3 x	0.5	TRE34206GS	4.0	56.0	18.0	3.5	2.7	6.0	3	2.5
M4 x	0.7	TRE34246GS	5.6	63.0	21.0	4.5	3.4	6.0	3	3.3
M5 x	0.8	TRE34286GS	6.4	70.0	25.0	6.0	4.9	8.0	3	4.2
M6 x	1.0	TRE34316GS	8.0	80.0	30.0	6.0	4.9	8.0	3	5.0
M8 x	1.25	TRE34366GS	13.0	90.0	35.0	8.0	6.2	9.0	3	6.8
M10 x	1.5	TRE34426GS	15.0	100.0	39.0	10.0	8.0	11.0	3	8.5
M12 x	1.75	TRE34506GS	18.0	110.0	44.0	9.0	7.0	10.0	3	10.3
M14 x	2.0	TRE34546GS	20.0	110.0	44.0	11.0	9.0	12.0	3	12.0
M16 x	2.0	TRE34606GS	20.0	110.0	44.0	12.0	9.0	12.0	3	14.0
M20 x	2.5	TRE34706GS	25.0	140.0	54.0	16.0	12.0	15.0	4	17.5

▶ DIN 371(M2~M10) and DIN 376(M12~M20)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	○	○	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	◎	◎	○	◎	◎	◎													

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YG-1 CO., LTD.

PRIME TAP

TRE31 SERIES

MF ISO Metric Fine Threads DIN 13

MMetrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

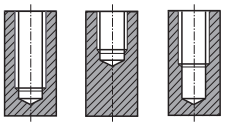
Machine taps
Maschinengewindebohrer

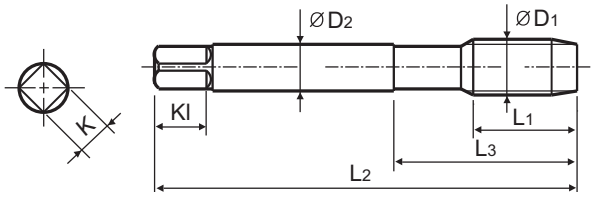
- High performance on various ductile materials
- Specially designed to prevent oversized threads and reduce gauging problems

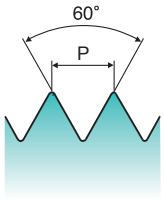
- Ausgezeichnete Leistung bei verschiedenen Werkstoffen.
- Speziell entwickelt, um zu gro ß e Gewindedurchmesser zu vermeiden und Messprobleme zu reduzieren.

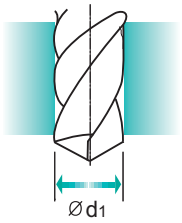
DIN 374

Hole type
2.5×D









Material groups **MU** | HSS PM | DIN 374 | 6HX | 60° | C | R45 | X Coating

p.B88

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	X-Coating	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M18 x	2.0	TRE31666GS	20.0	125.0	50.0	14.0	11.0	14.0	4	16.0
M18 x	1.5	TRE31676GS	15.0	110.0	44.0	14.0	11.0	14.0	4	16.5
M18 x	1.0	TRE31686GS	15.0	110.0	44.0	14.0	11.0	14.0	4	17.0
M20 x	2.0	TRE31716GS	20.0	140.0	54.0	16.0	12.0	15.0	4	18.0
M20 x	1.5	TRE31726GS	15.0	125.0	50.0	16.0	12.0	15.0	4	18.5
M20 x	1.0	TRE31736GS	15.0	125.0	50.0	16.0	12.0	15.0	4	19.0
M22 x	2.0	TRE31756GS	20.0	140.0	54.0	18.0	14.5	17.0	4	20.0
M22 x	1.5	TRE31766GS	15.0	125.0	50.0	18.0	14.5	17.0	4	20.5
M22 x	1.0	TRE31776GS	15.0	125.0	50.0	18.0	14.5	17.0	4	21.0
M24 x	2.0	TRE31796GS	20.0	140.0	54.0	18.0	14.5	17.0	4	22.0
M24 x	1.5	TRE31806GS	15.0	140.0	54.0	18.0	14.5	17.0	4	22.5
M24 x	1.0	TRE31816GS	15.0	140.0	54.0	18.0	14.5	17.0	4	23.0

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	○	○	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	◎	◎	○	◎	◎	◎													

PRIME TAP

TRE33 SERIES

UNF Unified Fine Threads

Unified Feingewinde
UNF
Unificato passo fine

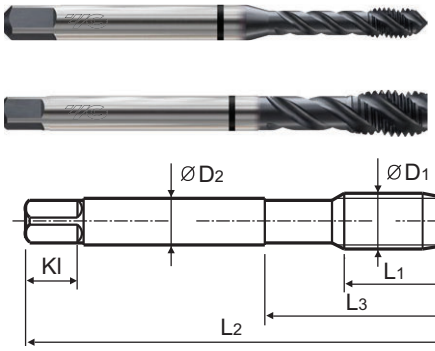
Machine taps
Maschinengewindebohrer

- ▶ High performance on various ductile materials
- ▶ Specially designed to prevent oversized threads and reduce gauging problems

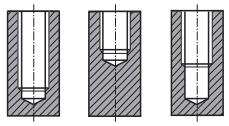
- ▶ Ausgezeichnete Leistung bei verschiedenen Werkstoffen.
- ▶ Speziell entwickelt, um zu gro ß e Gewindedurchmesser zu vermeiden und Messprobleme zu reduzieren.

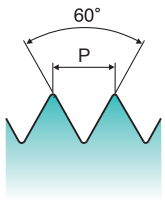
DIN 371

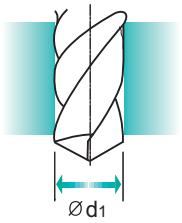
DIN 374



Hole type
2.5×D







Material groups **MU**

HSS PM | DIN 371/374 | 2BX | 60° | C | R45 | X Coating

p.B88

Unit : mm

SIZE ØD1	TPI	EDP No. X-Coating	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	48 UNF	TRE33182GS	5.1	56.0	18.0	3.5	2.7	6.0	2	2.40
#5	44 UNF	TRE33222GS	5.1	56.0	18.0	3.5	2.7	6.0	3	2.70
#6	40 UNF	TRE33262GS	6.4	56.0	20.0	4.0	3.0	6.0	3	2.90
#8	36 UNF	TRE33302GS	6.4	63.0	21.0	4.5	3.4	6.0	3	3.50
#10	32 UNF	TRE33342GS	8.5	70.0	25.0	6.0	4.9	8.0	3	4.10
#12	28 UNF	TRE33382GS	8.5	80.0	30.0	6.0	4.9	8.0	3	4.60
1/4	28 UNF	TRE33422GS	10.2	80.0	30.0	7.0	5.5	8.0	3	5.50
5/16	24 UNF	TRE33462GS	10.6	90.0	35.0	8.0	6.2	9.0	3	6.90
3/8	24 UNF	TRE33502GS	10.6	100.0	39.0	9.0	7.0	10.0	3	8.50
7/16	20 UNF	TRE33542GS	12.7	100.0	40.0	8.0	6.2	9.0	3	9.90
1/2	20 UNF	TRE33582GS	12.7	100.0	40.0	9.0	7.0	10.0	3	11.50
9/16	18 UNF	TRE33622GS	14.2	100.0	40.0	11.0	9.0	12.0	3	12.90
5/8	18 UNF	TRE33662GS	14.2	100.0	40.0	12.0	9.0	12.0	3	14.50
3/4	16 UNF	TRE33722GS	15.9	110.0	44.0	14.0	11.0	14.0	4	17.50
7/8	14 UNF	TRE33762GS	18.2	125.0	50.0	18.0	14.5	17.0	4	20.50
1	12 UNF	TRE33802GS	21.2	140.0	54.0	20.0	16.0	19.0	4	23.20

▶ DIN 371(#4~3/8) and DIN 374(7/16~1)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	○	○	○	◎	◎	◎	○	○	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	◎	◎	○	◎	◎	◎													

PRIME TAP

TRJ16 SERIES

MF ISO Metric Fine Threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo grosso DIN 13

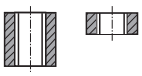
Machine taps
Maschinengewindebohrer

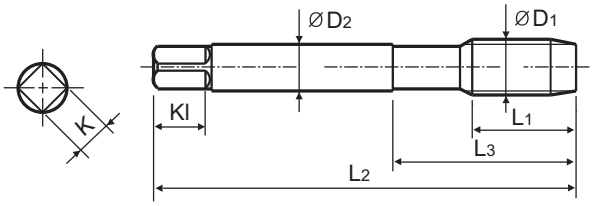
- High performance on various ductile materials
- Specially designed to prevent oversized threads and reduce gauging problems

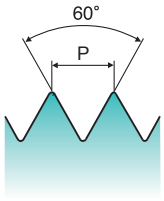
- Ausgezeichnete Leistung bei verschiedenen Werkstoffen.
- Speziell entwickelt, um zu gro ß e Gewindedurchmesser zu vermeiden und Messprobleme zu reduzieren.

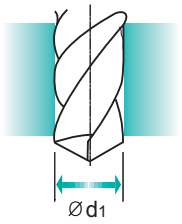
DIN 374

Hole type
3.0×D









Material groups **MU** | HSS PM | DIN 374 | 6HX | 60° | B | X Coating

p.B88

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	X-Coating	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M4 x	0.35	TRJ16696GS	10.0	63.0	21.0	2.8	2.1	5.0	3	3.7
M5 x	0.5	TRJ16296GS	11.0	70.0	25.0	3.5	2.7	6.0	3	4.5
M6 x	0.75	TRJ16326GS	13.0	80.0	30.0	4.5	3.4	6.0	3	5.3
M6 x	0.5	TRJ16336GS	13.0	80.0	30.0	4.5	3.4	6.0	3	5.5
M8 x	1.0	TRJ16376GS	17.0	90.0	36.0	6.0	4.9	8.0	3	7.0
M8 x	0.75	TRJ16386GS	14.0	80.0	30.0	6.0	4.9	8.0	3	7.3
M9 x	1.0	TRJ16406GS	20.0	90.0	36.0	7.0	5.5	8.0	3	8.0
M9 x	0.75	TRJ16416GS	17.0	80.0	36.0	7.0	5.5	8.0	3	8.3
M10 x	1.25	TRJ16436GS	22.0	100.0	40.0	7.0	5.5	8.0	3	8.8
M10 x	1.0	TRJ16446GS	18.0	90.0	36.0	7.0	5.5	8.0	3	9.0
M10 x	0.75	TRJ16456GS	18.0	90.0	36.0	7.0	5.5	8.0	3	9.3
M12 x	1.5	TRJ16516GS	22.0	100.0	40.0	9.0	7.0	10.0	3	10.5
M12 x	1.25	TRJ16526GS	22.0	100.0	40.0	9.0	7.0	10.0	3	10.8
M12 x	1.0	TRJ16536GS	18.0	100.0	40.0	9.0	7.0	10.0	3	11.0
M14 x	1.5	TRJ16556GS	22.0	100.0	40.0	11.0	9.0	12.0	3	12.5
M14 x	1.25	TRJ16566GS	22.0	100.0	40.0	11.0	9.0	12.0	3	12.8
M14 x	1.0	TRJ16576GS	18.0	100.0	40.0	11.0	9.0	12.0	3	13.0
M16 x	1.5	TRJ16616GS	22.0	100.0	40.0	12.0	9.0	12.0	3	14.5
M16 x	1.0	TRJ16626GS	18.0	100.0	40.0	12.0	9.0	12.0	3	15.0

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○	○	◎	◎	○	◎	◎	◎													

PRIME TAP

TRJ17 SERIES

UNC Unified Coarse Threads

Unified Grobgewinde
UNC
Unificato passo fine

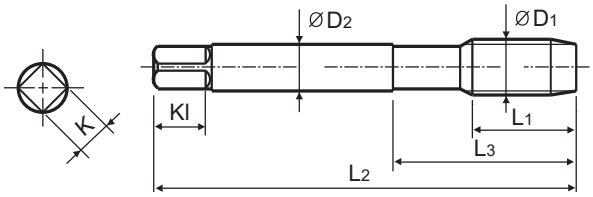
Machine taps
Maschinengewindebohrer

- High performance on various ductile materials
- Specially designed to prevent oversized threads and reduce gauging problems

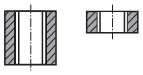
- Ausgezeichnete Leistung bei verschiedenen Werkstoffen.
- Speziell entwickelt, um zu gro ß e Gewindedurchmesser zu vermeiden und Messprobleme zu reduzieren.

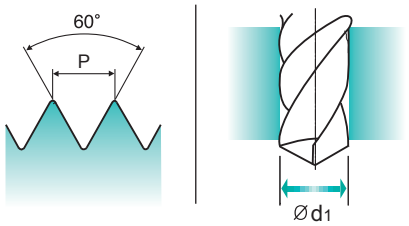
DIN 371

DIN 376



Hole type
3.0×D





Material groups **MU**

HSS PM | DIN 371/376 | 2BX | 60° | B | X Coating

p.B88

Unit : mm

SIZE ØD1	TPI	EDP No. X-Coating	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	- 40 UNC	TRJ17162GS	11.0	56.0	18.0	3.5	2.7	6.0	2	2.30
#5	- 40 UNC	TRJ17202GS	11.0	56.0	18.0	3.5	2.7	6.0	3	2.60
#6	- 32 UNC	TRJ17242GS	12.0	56.0	20.0	4.0	3.0	6.0	3	2.80
#8	- 32 UNC	TRJ17282GS	13.0	63.0	21.0	4.5	3.4	6.0	3	3.40
#10	- 24 UNC	TRJ17322GS	15.0	70.0	25.0	6.0	4.9	8.0	3	3.90
#12	- 24 UNC	TRJ17362GS	16.0	80.0	30.0	6.0	4.9	8.0	3	4.50
1/4	- 20 UNC	TRJ17402GS	17.0	80.0	30.0	7.0	5.5	8.0	3	5.10
5/16	- 18 UNC	TRJ17442GS	20.0	90.0	35.0	8.0	6.2	9.0	3	6.60
3/8	- 16 UNC	TRJ17482GS	22.0	100.0	39.0	9.0	7.0	10.0	3	8.00
7/16	- 14 UNC	TRJ17522GS	22.0	100.0	40.0	8.0	6.2	9.0	3	9.40
1/2	- 13 UNC	TRJ17562GS	25.0	110.0	44.0	9.0	7.0	10.0	3	10.80
9/16	- 12 UNC	TRJ17602GS	26.0	110.0	44.0	11.0	9.0	12.0	3	12.20
5/8	- 11 UNC	TRJ17642GS	27.0	110.0	44.0	12.0	9.0	12.0	3	13.60
3/4	- 10 UNC	TRJ17702GS	30.0	125.0	50.0	14.0	11.0	14.0	3	16.50
7/8	- 9 UNC	TRJ17742GS	32.0	140.0	54.0	18.0	14.5	17.0	3	19.50
1	- 8 UNC	TRJ17782GS	36.0	160.0	60.0	20.0	16.0	19.0	3	22.20

- DIN371 (#4~3/8) and DIN376 (7/16~1)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	◎	◎	○	◎	◎	◎													

PRIME TAP

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

					TRE30, TRE31, TRE32 TRE33, TRE34	TRJ15, TRJ16 TRJ17, TRJ18
ISO	VDI 3323	Material Description	HB	HRc	Vc (m/min.)	
P	1	Non-alloy steel	125		5-20	15-45
	2		190	13	10-50	10-55
	3		250	25	10-50	10-55
	4		270	28	15-40	15-50
	5		300	32	15-40	15-50
	6	Low alloy steel	180	10	8-30	8-30
	7		275	29	8-30	8-30
	8		300	32	8-30	8-30
	9		350	38	8-30	8-30
	10	High alloyed steel, and tool steel	200	15	8-30	8-30
	11		325	35	8-30	8-30
M	12	Stainless steel	200	15	5-15	8-20
	13		240	23	5-15	8-20
	14		180	10	5-15	8-20
K	15	Grey cast iron	180	10	15-35	15-35
	16		260	26	15-35	15-35
	17	Nodular cast iron	160	3	15-35	15-35
	18		250	25	15-35	15-35
N	21	Aluminum-wrought alloy	60		15-35	15-35
	22		100		15-35	15-35
	23	Aluminum-cast, alloyed	75		15-35	15-35
	24		90		15-35	15-35
	25		130		15-35	15-35
	26	Copper and Copper Alloys (Bronze / Brass)	110		15-35	15-35
	27		90		15-35	15-35
	28		100		15-35	15-35

Leading Through Innovation

HSS-E

COMBO TAP
COMBO GEWINDEBOHRER

- For Multi Purpose Tapping
- Für Mehrbereichs-Gewindebohren

SELECTION GUIDE

YG THREADING TOOLS

HSS-E COMBO TAP

HSS-E TAPS for Multi-Purpose

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B130

HOLE TYPE			Max. 2.5xD Blind Hole					
TOOL MATERIAL			HSS-E					
CHAMFER LEAD ACC. TO DIN2197			C	C	C	C	C	C
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute
SPIRAL FLUTE ANGLE			R40	R40	R40	R40	R40	R40
SERIES	M	DIN371/376	TC804 (p.B94)	TD804 (p.B94)	TB804 (p.B94)	TCE05 (p.B96)	TDE05 (p.B96)	TBE05 (p.B96)
		DIN352						
		DIN357/LONG						
	MF	DIN374	TC844 (p.B100)	TD844 (p.B100)	TB844 (p.B100)	TCE09 (p.B103)	TDE09 (p.B103)	
		DIN2181						
	UNC	DIN371/376	TC824 (p.B108)	TD824 (p.B108)	TB824 (p.B108)	TCE01 (p.B109)	TDE01 (p.B109)	
		DIN351						
	UNF	DIN371/374	TC864 (p.B110)	TD864 (p.B110)	TB864 (p.B110)	TCE02 (p.B111)	TDE02 (p.B111)	
		DIN2181						
	BSW	DIN2182/2183						
		DIN351						
	G(BSP)	DIN5156/5157						
	EG-M	DIN371/376						
	EG-UNC	DIN371/376						
	EG-UNF	DIN371/374						
SURFACE TREATMENT			Bright	TiN	VAP	Bright	TiN	VAP
MODEL								

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRC						
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○	○	○
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○	○	○
	11			Quenched & Tempered	325	35						
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	Ferritic		130							
	20		Pearlitic		230	21						
N	21	Aluminum-wrought alloy	Not Curable		60							
	22		Curable	Hardened	100							
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎	◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90							
	25		> 12% Si, Not Curable		130							
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	◎	◎	◎	◎	◎
	27		CuZn, CuSnZn (Brass)		90		◎	◎	◎	◎	◎	◎
	28		CuSn, lead-free copper and electrolytic copper		100		◎	◎	◎	◎	◎	◎
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic									
	30		Rubber, Wood, etc.									
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15						
	32			Cured	280	30						
	33		Ni or Co Based	Annealed	250	25						
	34			Cured	350	38						
	35			Cast	320	34						
	36	Titanium Alloys	Pure Titanium		400 Rm							
	37		Alpha + Beta Alloys	Hardened	1050 Rm							
H	38	Hardened steel		Hardened	550	55						
	39			Hardened	630	60						
	40	Chilled Cast Iron		Cast	400	42						
	41	Hardened Cast Iron		Hardened	550	55						

SELECTION GUIDE

YG THREADING TOOLS

HSS-E COMBO TAP

HSS-E TAPS for Multi-Purpose

HOLE TYPE			Max. 3.0xD Through Hole					
TOOL MATERIAL			HSS-E					
CHAMFER LEAD ACC. TO DIN2197			B	B	B	B	B	B
FLUTE TYPE			Spiral Point	Spiral Point	Spiral Point	Spiral Point	Spiral Point	Spiral Point
SPIRAL FLUTE ANGLE			-	-	-	-	-	-
SERIES	M	DIN 371/376	TC814 (p.B112)	TD814 (p.B112)	TB814 (p.B112)	TCJ05 (p.B114)	TDJ05 (p.B114)	TBJ05 (p.B114)
		DIN352						
		DIN357/LONG						
	MF	DIN374	TC854 (p.B118)	TD854 (p.B118)	TB854 (p.B118)	TCJ09 (p.B121)	TDJ09 (p.B121)	
		DIN2181						
	UNC	DIN 371/376	TC834 (p.B125)	TD834 (p.B125)	TB834 (p.B125)	TCJ01 (p.B126)	TDJ01 (p.B126)	
		DIN351						
	UNF	DIN 371/374	TC874 (p.B127)	TD874 (p.B127)	TB874 (p.B127)	TCJ02 (p.B128)	TDJ02 (p.B128)	
		DIN2181						
	BSW	DIN2182/2183						
		DIN351						
	G(BSP)	DIN5156/5157						
	EG-M	DIN 371/376						
	EG-UNC	DIN 371/376						
	EG-UNF	DIN 371/374						
SURFACE TREATMENT			Bright	TiN	VAP	Bright	TiN	VAP
MODEL								

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B130

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRC						
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○	○	○
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○	○	○
	11			Quenched & Tempered	325	35						
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	Ferritic		130							
	20		Pearlitic		230	21						
N	21	Aluminum-wrought alloy	Not Curable		60							
	22		Curable	Hardened	100							
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎	◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90							
	25		> 12% Si, Not Curable		130							
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	◎	◎	◎	◎	◎
	27		CuZn, CuSnZn (Brass)		90		◎	◎	◎	◎	◎	◎
	28		CuSn, lead-free copper and electrolytic copper		100		◎	◎	◎	◎	◎	◎
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic									
	30		Rubber, Wood, etc.									
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15						
	32			Cured	280	30						
	33		Ni or Co Based	Annealed	250	25						
	34			Cured	350	38						
	35			Cast	320	34						
	36	Titanium Alloys	Pure Titanium		400 Rm							
	37		Alpha + Beta Alloys	Hardened	1050 Rm							
H	38	Hardened steel		Hardened	550	55						
	39			Hardened	630	60						
	40	Chilled Cast Iron		Cast	400	42						
	41	Hardened Cast Iron		Hardened	550	55						

COMBO TAP

Vap **TB804 SERIES**
Bright **TC804 SERIES**
TiN **TD804 SERIES**

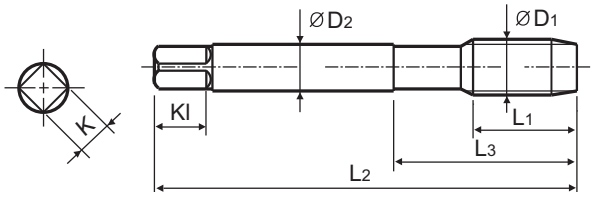
M ISO Metric coarse threads DIN 13

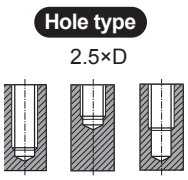
Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

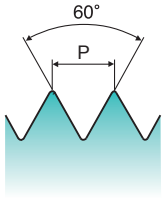
Machine taps
Maschinengewindebohrer

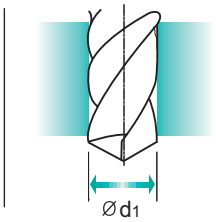
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.









Material groups **MU** | HSS-E | DIN 371/376 | 6H | 60° | C | R40 | Vap Bright TiN

p.B130

Unit : mm

SIZE	Pitch	EDP No.			Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	Bright	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2 ×	0.4	TB804136	TC804136	TD804136	8	45	13	2.8	2.1	5	3	1.6
M2.2 ×	0.45	-	TC804156	-	8	45	13	2.8	2.1	5	3	1.75
M2.3 ×	0.4	TB804196	TC804196	TD804196	8	45	13	2.8	2.1	5	3	1.9
M2.5 ×	0.45	TB804176	TC804176	TD804176	9	50	15	2.8	2.1	5	3	2.05
M2.6 ×	0.45	TB804496	TC804496	TD804496	9	50	15	2.8	2.1	5	3	2.1
M3 ×	0.5	TB804206	TC804206	TD804206	6	56	18	3.5	2.7	6	3	2.5
M3.5 ×	0.6	-	TC804226	TD804226	7	56	20	4	3	6	3	2.9
M4 ×	0.7	TB804246	TC804246	TD804246	7	63	21	4.5	3.4	6	3	3.3
M4.5 ×	0.75	TB804266	TC804266	TD804266	8	70	25	6	4.9	8	3	3.7
M5 ×	0.8	TB804286	TC804286	TD804286	8	70	25	6	4.9	8	3	4.2
M6 ×	1.0	TB804316	TC804316	TD804316	10	80	30	6	4.9	8	3	5
M7 ×	1.0	TB804346	TC804346	TD804346	10	80	30	7	5.5	8	3	6
M8 ×	1.25	TB804366	TC804366	TD804366	13	90	35	8	6.2	9	3	6.8
M9 ×	1.25	TB804396	TC804396	TD804396	13	90	35	9	7	10	3	7.8
M10 ×	1.5	TB804426	TC804426	TD804426	15	100	39	10	8	11	3	8.5
M11 ×	1.5	TB804466	TC804466	-	17	100	40	8	6.2	9	3	9.5
M12 ×	1.75	TB804506	TC804506	TD804506	18	110	44	9	7	10	3	10.2
M14 ×	2.0	TB804546	TC804546	TD804546	20	110	44	11	9	12	3	12
M16 ×	2.0	TB804606	TC804606	TD804606	20	110	44	12	9	12	3	14
M18 ×	2.5	TB804656	TC804656	TD804656	25	125	50	14	11	14	4	15.5
M20 ×	2.5	TB804706	TC804706	TD804706	25	140	54	16	12	15	4	17.5
M22 ×	2.5	TB804746	TC804746	TD804746	25	140	54	18	14.5	17	4	19.5

▶ DIN 371(M2~M10) and DIN 376(M11~M52)
▶ The other coating(TiCN or TiAlN) is available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COMBO TAP

Vap **TBE05 SERIES**
Bright **TCE05 SERIES**
TiN **TDE05 SERIES**

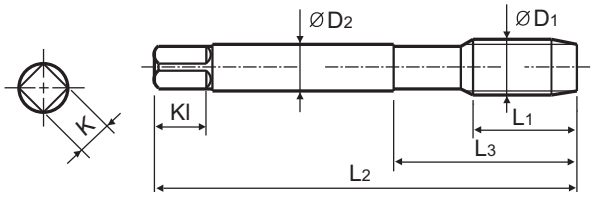
M ISO Metric coarse threads DIN 13

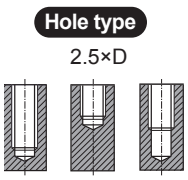
Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

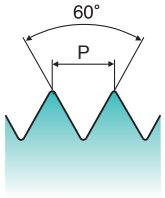
Machine taps
Maschinengewindebohrer

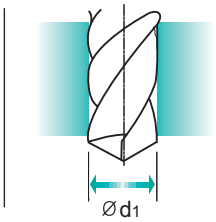
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.









Material groups **MU** | HSS-E | DIN 371/376 | 4H | 60° | C | R40 | Vap Bright TiN

p.B130

Unit : mm

SIZE	Pitch	EDP No.			Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	Bright	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2 ×	0.4	TBE05136	TCE05136	TDE05136	8	45	13	2.8	2.1	5	3	1.6
M2.2 ×	0.45	TBE05156	TCE05156	TDE05156	8	45	13	2.8	2.1	5	3	1.75
M2.3 ×	0.4	TBE05196	TCE05196	TDE05196	8	45	13	2.8	2.1	5	3	1.9
M2.5 ×	0.45	TBE05176	TCE05176	TDE05176	9	50	15	2.8	2.1	5	3	2.05
M2.6 ×	0.45	TBE05496	TCE05496	-	9	50	15	2.8	2.1	5	3	2.1
M3 ×	0.5	TBE05206	TCE05206	TDE05206	6	56	18	3.5	2.7	6	3	2.5
M3.5 ×	0.6	TBE05226	TCE05226	TDE05226	7	56	20	4	3	6	3	2.9
M4 ×	0.7	TBE05246	TCE05246	TDE05246	7	63	21	4.5	3.4	6	3	3.3
M4.5 ×	0.75	TBE05266	TCE05266	TDE05266	8	70	25	6	4.9	8	3	3.7
M5 ×	0.8	TBE05286	TCE05286	TDE05286	8	70	25	6	4.9	8	3	4.2
M6 ×	1.0	TBE05316	TCE05316	TDE05316	10	80	30	6	4.9	8	3	5
M7 ×	1.0	TBE05346	TCE05346	TDE05346	10	80	30	7	5.5	8	3	6
M8 ×	1.25	TBE05366	TCE05366	TDE05366	13	90	35	8	6.2	9	3	6.8
M9 ×	1.25	TBE05396	TCE05396	TDE05396	13	90	35	9	7	10	3	7.8
M10 ×	1.5	TBE05426	TCE05426	TDE05426	15	100	39	10	8	11	3	8.5
M11 ×	1.5	TBE05466	TCE05466	TDE05466	17	100	40	8	6.2	9	3	9.5
M12 ×	1.75	TBE05506	TCE05506	TDE05506	18	110	44	9	7	10	3	10.2
M14 ×	2.0	-	TCE05546	TDE05546	20	110	44	11	9	12	3	12
M16 ×	2.0	TBE05606	TCE05606	TDE05606	20	110	44	12	9	12	3	14
M18 ×	2.5	TBE05656	TCE05656	TDE05656	25	125	50	14	11	14	4	15.5
M20 ×	2.5	TBE05706	TCE05706	TDE05706	25	140	54	16	12	15	4	17.5
M22 ×	2.5	TBE05746	TCE05746	TDE05746	25	140	54	18	14.5	17	4	19.5
M24 ×	3.0	TBE05786	TCE05786	TDE05786	30	160	60	18	14.5	17	4	21
M27 ×	3.0	TBE05866	TCE05866	TDE05866	30	160	60	20	16	19	4	24
M30 ×	3.5	TBE05946	TCE05946	TDE05946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ The other coating(TiCN or TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COMBO TAP

Vap **TBE07 SERIES**
Bright **TCE07 SERIES**
TiN **TDE07 SERIES**

M ISO Metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

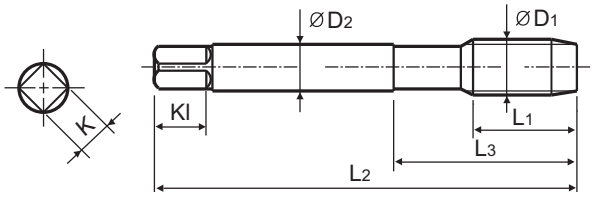
Machine taps
Maschinengewindebohrer

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

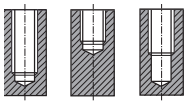
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

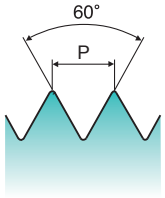
DIN 371

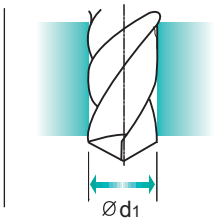
DIN 376



Hole type
2.5×D







Material groups **MU** | HSS-E | DIN 371/376 | 6G | 60° | C | R40 | Vap Bright TiN

p.B130

Unit : mm

SIZE ØD1	Pitch P	EDP No. Vap	Bright	TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
M2	0.4	-	TCE07136	-	8	45	13	2.8	2.1	5	3	1.6
M2.2	0.45	TBE07156	TCE07156	TDE07156	8	45	13	2.8	2.1	5	3	1.75
M2.3	0.4	TBE07196	TCE07196	TDE07196	8	45	13	2.8	2.1	5	3	1.9
M2.5	0.45	-	TCE07176	-	9	50	15	2.8	2.1	5	3	2.05
M2.6	0.45	TBE07496	TCE07496	TDE07496	9	50	15	2.8	2.1	5	3	2.1
M3	0.5	TBE07206	TCE07206	TDE07206	6	56	18	3.5	2.7	6	3	2.5
M3.5	0.6	-	TCE07226	TDE07226	7	56	20	4	3	6	3	2.9
M4	0.7	TBE07246	TCE07246	TDE07246	7	63	21	4.5	3.4	6	3	3.3
M4.5	0.75	TBE07266	TCE07266	TDE07266	8	70	25	6	4.9	8	3	3.7
M5	0.8	TBE07286	TCE07286	TDE07286	8	70	25	6	4.9	8	3	4.2
M6	1.0	TBE07316	TCE07316	TDE07316	10	80	30	6	4.9	8	3	5
M7	1.0	TBE07346	TCE07346	TDE07346	10	80	30	7	5.5	8	3	6
M8	1.25	TBE07366	TCE07366	TDE07366	13	90	35	8	6.2	9	3	6.8
M9	1.25	TBE07396	TCE07396	-	13	90	35	9	7	10	3	7.8
M10	1.5	TBE07426	TCE07426	TDE07426	15	100	39	10	8	11	3	8.5
M11	1.5	TBE07466	TCE07466	TDE07466	17	100	40	8	6.2	9	3	9.5
M12	1.75	TBE07506	TCE07506	TDE07506	18	110	44	9	7	10	3	10.2
M14	2.0	TBE07546	TCE07546	-	20	110	44	11	9	12	3	12
M16	2.0	TBE07606	TCE07606	TDE07606	20	110	44	12	9	12	3	14
M18	2.5	TBE07656	TCE07656	TDE07656	25	125	50	14	11	14	4	15.5
M20	2.5	TBE07706	TCE07706	-	25	140	54	16	12	15	4	17.5
M22	2.5	TBE07746	TCE07746	TDE07746	25	140	54	18	14.5	17	4	19.5
M24	3.0	TBE07786	TCE07786	-	30	160	60	18	14.5	17	4	21
M27	3.0	TBE07866	TCE07866	TDE07866	30	160	60	20	16	19	4	24
M30	3.5	TBE07946	TCE07946	TDE07946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ The other coating(TiCN or TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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YG-1 CO., LTD.

COMBO TAP

Vap **TB844 SERIES**
Bright **TC844 SERIES**
TiN **TD844 SERIES**

MF ISO Metric fine threads DIN 13

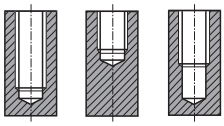
Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

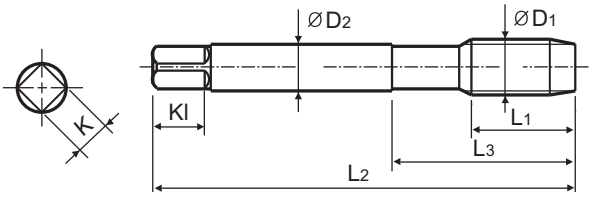
Machine taps
Maschinengewindebohrer

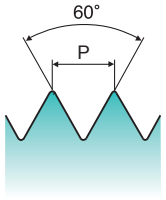
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

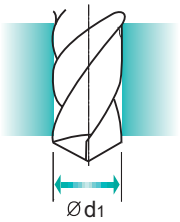
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

Hole type
2.5×D









Material groups **MU** | HSS-E | DIN 374 | 6H | 60° | C | R40 | Vap Bright TiN

p.B130

Unit : mm

SIZE	Pitch	EDP No.			Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	Bright	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M4 ×	0.5	TB844256	TC844256	TD844256	5	63	21	2.8	2.1	5	3	3.5
M5 ×	0.5	TB844296	TC844296	TD844296	5	70	25	3.5	2.7	6	3	4.5
M6 ×	0.75	TB844326	TC844326	TD844326	8	80	30	4.5	3.4	6	3	5.2
M6 ×	0.5	TB844336	TC844336	TD844336	5	80	30	4.5	3.4	6	3	5.5
M7 ×	0.75	-	TC844356	TD844356	10	80	30	5.5	4.3	7	3	6.2
M8 ×	1.0	TB844376	TC844376	TD844376	10	90	36	6	4.9	8	3	7
M8 ×	0.75	TB844386	TC844386	TD844386	8	80	30	6	4.9	8	3	7.2
M10 ×	1.25	-	TC844436	TD844436	16	100	40	7	5.5	8	3	8.8
M10 ×	1.0	-	TC844446	TD844446	10	90	36	7	5.5	8	3	9
M10 ×	0.75	TB844456	TC844456	TD844456	10	90	36	7	5.5	8	3	9.2
M12 ×	1.5	TB844516	TC844516	TD844516	15	100	40	9	7	10	3	10.5
M12 ×	1.25	TB844526	TC844526	TD844526	15	100	40	9	7	10	3	10.8
M12 ×	1.0	TB844536	TC844536	TD844536	11	100	40	9	7	10	3	11
M14 ×	1.5	TB844556	TC844556	TD844556	15	100	40	11	9	12	3	12.5
M14 ×	1.25	-	TC844566	TD844566	15	100	40	11	9	12	3	12.8
M14 ×	1.0	TB844576	TC844576	TD844576	11	100	40	11	9	12	3	13
M16 ×	1.5	-	TC844616	TD844616	15	100	40	12	9	12	3	14.5
M16 ×	1.0	TB844626	TC844626	TD844626	12	100	40	12	9	12	3	15
M18 ×	1.5	TB844676	TC844676	TD844676	17	110	44	14	11	14	4	16.5
M18 ×	1.0	TB844686	TC844686	TD844686	13	110	44	14	11	14	4	17
M20 ×	1.5	TB844726	TC844726	TD844726	17	125	50	16	12	15	4	18.5
M20 ×	1.0	TB844736	TC844736	-	14	125	50	16	12	15	4	19
M22 ×	1.5	TB844766	TC844766	TD844766	17	125	50	18	14.5	17	4	20.5
M22 ×	1.0	-	TC844776	TD844776	14	125	50	18	14.5	17	4	21

▶ The other coating(TiCN or TiAlN) is available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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YG-1 CO., LTD.

COMBO TAP

Vap **TB844** SERIES
Bright **TC844** SERIES
TiN **TD844** SERIES

MF ISO Metric fine threads DIN 13

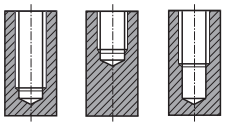
Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

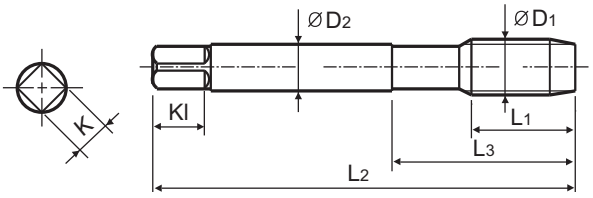
Machine taps
Maschinengewindebohrer

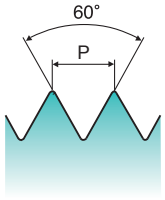
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

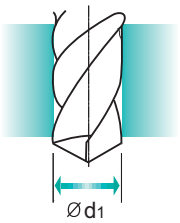
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

Hole type
2.5×D









Material groups **MU** | HSS-E | DIN 374 | 6H | 60° | C | R40 | Vap Bright TiN

p.B130

Unit : mm

SIZE	Pitch	EDP No.			Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	Bright	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M48 x	3.0	-	TC844E56	TD844E56	36	225	90	36	29	32	4	45.0
M48 x	2.0	-	TC844E66	TD844E66	28	190	80	36	29	32	4	46.0
M48 x	1.5	-	TC844E76	TD844E76	28	190	80	36	29	32	4	46.5
M50 x	1.5	-	TC844F16	TD844F16	28	190	80	36	29	32	4	48.5
M52 x	3.0	-	TC844F56	TD844F56	36	225	90	40	32	35	4	49.0
M52 x	2.0	-	TC844F66	TD844F66	28	190	80	40	32	35	4	50.0
M52 x	1.5	-	TC844F76	TD844F76	28	190	80	40	32	35	4	50.5

▶ The other coating(TiCN or TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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YG-1 CO., LTD.

COMBO TAP

Bright **TCE09** SERIES
TiN **TDE09** SERIES

MF ISO Metric fine threads DIN 13

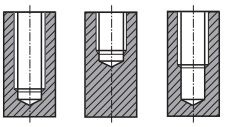
Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

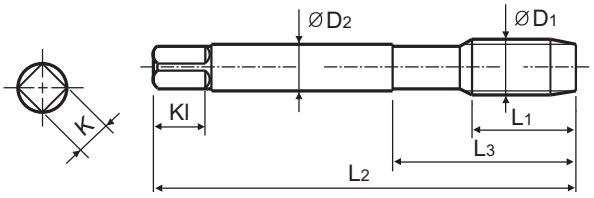
Machine taps
Maschinengewindebohrer

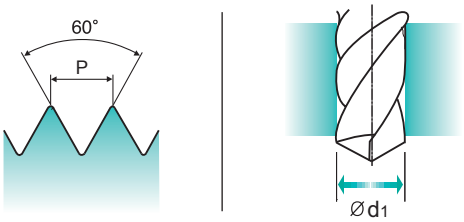
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

Hole type
2.5×D







Material groups **MU** | HSS-E | DIN 374 | 6G | 60° | C | R40 | TiN | Bright

p.B130

Unit : mm

SIZE	Pitch	EDP No.		Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M24 ×	2.0	TCE09796	TDE09796	20	140	54	18	14.5	17	4	22
M24 ×	1.5	TCE09806	TDE09806	20	140	54	18	14.5	17	4	22.5
M26 ×	1.5	TCE09856	TDE09856	20	140	54	18	14.5	17	4	24.5
M27 ×	2.0	TCE09876	-	20	140	54	20	16	19	4	25
M27 ×	1.5	TCE09886	TDE09886	20	140	54	20	16	19	4	25.5
M28 ×	1.5	TCE09916	-	20	140	54	20	16	19	4	26.5
M30 ×	2.0	TCE09966	TDE09966	22	150	57	22	18	21	4	28
M30 ×	1.5	TCE09976	-	22	150	57	22	18	21	4	28.5

▶ The other coating(TiCN or TiAlN) or Surface Treatment(Steam Homo) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

COMBO TAP

TC807 SERIES

M ISO Metric coarse threads DIN 13

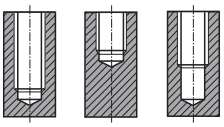
Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

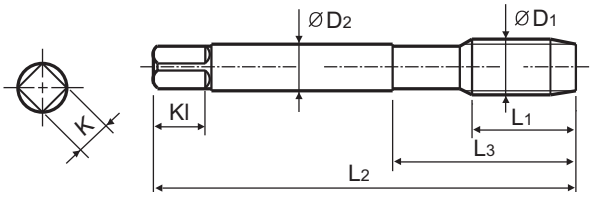
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

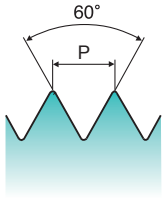
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

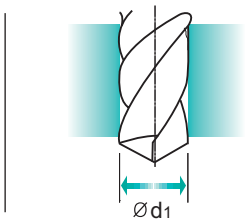
Hole type
2.5×D



Short Chamfer







Material groups **MU** | HSS-E | DIN 371/376 | 6H | 60° | E | R40 | Bright

p.B130

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2 ×	0.4	TC807136	8	45	13	2.8	2.1	5	3	1.6
M2.2 ×	0.45	TC807156	8	45	13	2.8	2.1	5	3	1.75
M2.3 ×	0.4	TC807196	8	45	13	2.8	2.1	5	3	1.9
M2.5 ×	0.45	TC807176	9	50	15	2.8	2.1	5	3	2.05
M2.6 ×	0.45	TC807496	9	50	15	2.8	2.1	5	3	2.1
M3 ×	0.5	TC807206	6	56	18	3.5	2.7	6	3	2.5
M3.5 ×	0.6	TC807226	7	56	20	4	3	6	3	2.9
M4 ×	0.7	TC807246	7	63	21	4.5	3.4	6	3	3.3
M4.5 ×	0.75	TC807266	8	70	25	6	4.9	8	3	3.7
M5 ×	0.8	TC807286	8	70	25	6	4.9	8	3	4.2
M6 ×	1.0	TC807316	10	80	30	6	4.9	8	3	5
M7 ×	1.0	TC807346	10	80	30	7	5.5	8	3	6
M8 ×	1.25	TC807366	13	90	35	8	6.2	9	3	6.8
M9 ×	1.25	TC807396	13	90	35	9	7	10	3	7.8
M10 ×	1.5	TC807426	15	100	39	10	8	11	3	8.5
M11 ×	1.5	TC807466	17	100	40	8	6.2	9	3	9.5
M12 ×	1.75	TC807506	18	110	44	9	7	10	3	10.2
M14 ×	2.0	TC807546	20	110	44	11	9	12	3	12
M16 ×	2.0	TC807606	20	110	44	12	9	12	3	14
M18 ×	2.5	TC807656	25	125	50	14	11	14	4	15.5
M20 ×	2.5	TC807706	25	140	54	16	12	15	4	17.5
M22 ×	2.5	TC807746	25	140	54	18	14.5	17	4	19.5
M24 ×	3.0	TC807786	30	160	60	18	14.5	17	4	21
M27 ×	3.0	TC807866	30	160	60	20	16	19	4	24
M30 ×	3.5	TC807946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ Coating(TiN, TiCN or TiAlN) or Surface Treatment(Steam Homo) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COMBO TAP

Vap **TB824 SERIES**
Bright **TC824 SERIES**
TiN **TD824 SERIES**

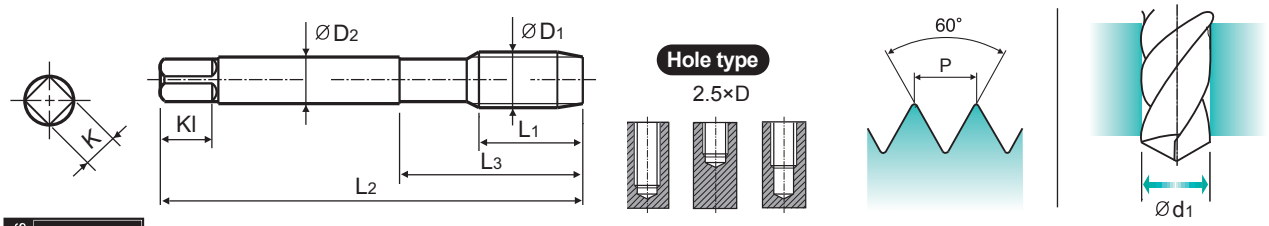
UNC Unified coarse threads

Unified Grobgewinde
UNC
Unificato passo grosso

Machine taps
Maschinengewindebohrer

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.



Material groups **MU** | HSS-E | DIN 371/376 | 2B | 60° | C | R40 | Vap Bright TiN

p.B130

Unit : mm

SIZE ØD1	TPI	EDP No. Vap	Bright	TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	40UNC	TB824162	TC824162	TD824162	6	56	18	3.5	2.7	6	3	2.3
#5	40UNC	TB824202	TC824202	TD824202	7	56	18	3.5	2.7	6	3	2.6
#6	32UNC	TB824242	TC824242	TD824242	7	56	20	4	3	6	3	2.85
#8	32UNC	-	TC824282	TD824282	8	63	21	4.5	3.4	6	3	3.5
#10	24UNC	TB824322	TC824322	TD824322	10	70	25	6	4.9	8	3	3.9
#12	24UNC	TB824362	TC824362	TD824362	10	80	30	6	4.9	8	3	4.5
1/4	20UNC	TB824402	TC824402	TD824402	13	80	30	7	5.5	8	3	5.2
5/16	18UNC	TB824442	TC824442	TD824442	14	90	35	8	6.2	9	3	6.6
3/8	16UNC	TB824482	TC824482	TD824482	16	100	39	9	7	10	3	8
7/16	14UNC	TB824522	TC824522	TD824522	17	100	40	8	6.2	9	3	9.4
1/2	13UNC	TB824562	TC824562	TD824562	20	110	44	9	7	10	3	10.75
9/16	12UNC	TB824602	TC824602	TD824602	20	110	44	11	9	12	3	12.25
5/8	11UNC	-	TC824642	TD824642	22	110	44	12	9	12	3	13.5
3/4	10UNC	TB824702	TC824702	TD824702	25	125	50	14	11	14	4	16.5
7/8	9UNC	TB824742	TC824742	TD824742	27	140	54	18	14.5	17	4	19.5
1	8UNC	-	TC824782	TD824782	30	160	60	20	16	19	4	22.25

▶ DIN 371(#4~3/8) and DIN 374(7/16~1)
▶ The other coating(TiCN or TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COMBO TAP

Vap **TB864 SERIES**
Bright **TC864 SERIES**
TiN **TD864 SERIES**

UNF — Unified fine threads

Unified Feingewinde
UNF
Unificato passo fine

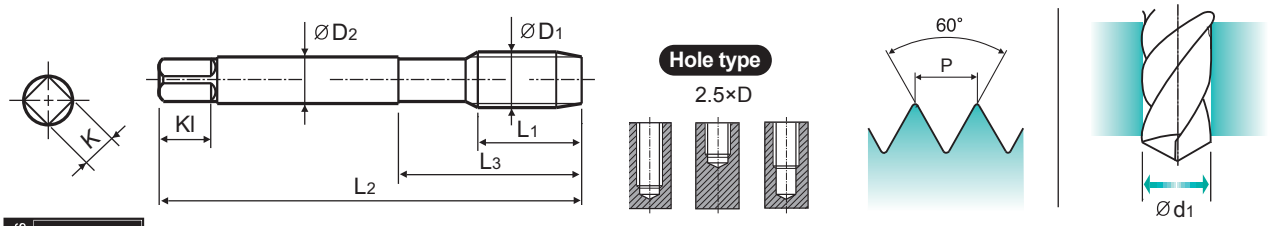
Machine taps
Maschinengewindebohrer

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

DIN 371

DIN 374



Material groups **MU** | HSS-E | DIN 371/374 | 2B | 60° | C | R40 | Vap Bright TiN

p.B130

Unit : mm

SIZE ØD1	TPI	EDP No. Vap	Bright	TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	48UNF	-	TC864182	-	6	56	18	3.5	2.7	6	3	2.4
#5	44UNF	TB864222	TC864222	TD864222	7	56	18	3.5	2.7	6	3	2.7
#6	40UNF	TB864262	TC864262	-	7	56	20	4	3	6	3	3
#8	36UNF	-	TC864302	TD864302	8	63	21	4.5	3.4	6	3	3.5
#10	32UNF	TB864342	TC864342	TD864342	10	70	25	6	4.9	8	3	4.1
#12	28UNF	TB864382	TC864382	TD864382	10	80	30	6	4.9	8	3	4.7
1/4	28UNF	TB864422	TC864422	TD864422	10	80	30	7	5.5	8	3	5.5
5/16	24UNF	TB864462	TC864462	TD864462	10	90	35	8	6.2	9	3	6.9
3/8	24UNF	TB864502	TC864502	TD864502	10	100	39	9	7	10	3	8.5
7/16	20UNF	TB864542	TC864542	TD864542	13	100	40	8	6.2	9	3	9.9
1/2	20UNF	TB864582	TC864582	TD864582	13	100	40	9	7	10	3	11.5
9/16	18UNF	TB864622	TC864622	TD864622	15	100	40	11	9	12	3	12.9
5/8	18UNF	-	TC864662	TD864662	15	100	40	12	9	12	3	14.5
3/4	16UNF	-	TC864722	TD864722	17	110	44	14	11	14	4	17.5
7/8	14UNF	-	TC864762	-	17	125	50	18	14.5	17	4	20.5
1	12UNF	-	TC864802	TD864802	20	140	54	20	16	19	4	23.25

▶ DIN 371(#4~3/8) and DIN 374(7/16~1)
▶ The other coating(TiCN or TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COMBO TAP

Vap **TB814 SERIES**
Bright **TC814 SERIES**
TiN **TD814 SERIES**

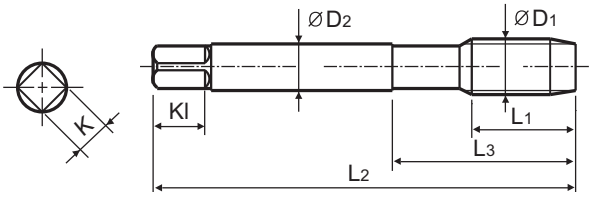
M ISO Metric coarse threads DIN 13

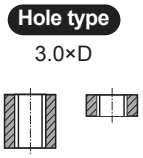
Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

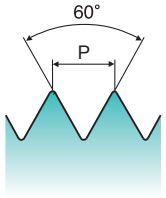
Machine taps
Maschinengewindebohrer

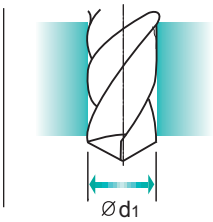
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.









Material groups **MU** | HSS-E | DIN 371/376 | 6H | 60° | B | Vap Bright TiN

p.B131

Unit : mm

SIZE ØD1	Pitch P	EDP No. Vap	Bright	TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
M2	0.4	TB814136	TC814136	TD814136	8	45	13	2.8	2.1	5	3	1.6
M2.2	0.45	TB814156	TC814156	TD814156	8	45	13	2.8	2.1	5	3	1.75
M2.3	0.4	TB814196	TC814196	TD814196	8	45	13	2.8	2.1	5	3	1.9
M2.5	0.45	TB814176	TC814176	TD814176	9	50	15	2.8	2.1	5	3	2.05
M2.6	0.45	TB814496	TC814496	TD814496	9	50	15	2.8	2.1	5	3	2.1
M3	0.5	TB814206	TC814206	TD814206	11	56	18	3.5	2.7	6	3	2.5
M3.5	0.6	TB814226	TC814226	TD814226	12	56	20	4	3	6	3	2.9
M4	0.7	TB814246	TC814246	TD814246	13	63	21	4.5	3.4	6	3	3.3
M4.5	0.75	TB814266	TC814266	TD814266	14	70	25	6	4.9	8	3	3.7
M5	0.8	TB814286	TC814286	TD814286	15	70	25	6	4.9	8	3	4.2
M6	1.0	TB814316	TC814316	TD814316	17	80	30	6	4.9	8	3	5
M7	1.0	TB814346	TC814346	TD814346	17	80	30	7	5.5	8	3	6
M8	1.25	TB814366	TC814366	TD814366	20	90	35	8	6.2	9	3	6.8
M9	1.25	TB814396	TC814396	TD814396	20	90	35	9	7	10	3	7.8
M10	1.5	TB814426	TC814426	TD814426	22	100	39	10	8	11	3	8.5
M11	1.5	TB814466	TC814466	-	22	100	40	8	6.2	9	3	9.5
M12	1.75	TB814506	TC814506	TD814506	24	110	44	9	7	10	3	10.2
M14	2.0	TB814546	TC814546	TD814546	26	110	44	11	9	12	3	12
M16	2.0	TB814606	TC814606	TD814606	27	110	44	12	9	12	3	14
M18	2.5	TB814656	TC814656	TD814656	30	125	50	14	11	14	4	15.5
M20	2.5	TB814706	TC814706	TD814706	32	140	54	16	12	15	4	17.5
M22	2.5	TB814746	TC814746	TD814746	32	140	54	18	14.5	17	4	19.5

▶ DIN 371(M2~M10) and DIN 376(M11~M52)
▶ The other coating(TiCN or TiAlN) is available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COMBO TAP

Vap **TBJ05 SERIES**
Bright **TCJ05 SERIES**
TiN **TDJ05 SERIES**

M ISO Metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

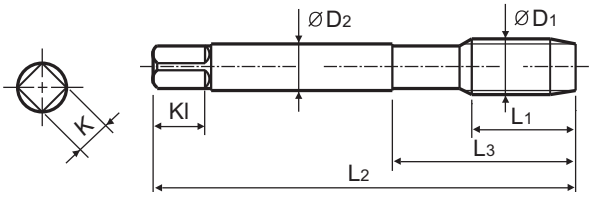
Machine taps
Maschinengewindebohrer

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

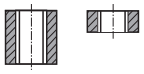
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

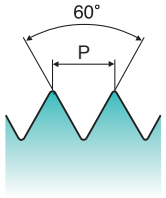
DIN 371

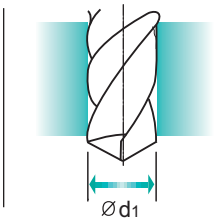
DIN 376



Hole type
3.0×D







Material groups **MU** | HSS-E | DIN 371/376 | 4H | 60° | B | Vap Bright TiN

p.B131

Unit : mm

SIZE ØD1	Pitch P	EDP No. Vap	Bright	TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
M2	0.4	TBJ05136	TCJ05136	TDJ05136	8	45	13	2.8	2.1	5	3	1.6
M2.2	0.45	TBJ05156	TCJ05156	TDJ05156	8	45	13	2.8	2.1	5	3	1.75
M2.3	0.4	TBJ05196	TCJ05196	TDJ05196	8	45	13	2.8	2.1	5	3	1.9
M2.5	0.45	TBJ05176	TCJ05176	-	9	50	15	2.8	2.1	5	3	2.05
M2.6	0.45	TBJ05496	TCJ05496	TDJ05496	9	50	15	2.8	2.1	5	3	2.1
M3	0.5	TBJ05206	TCJ05206	TDJ05206	11	56	18	3.5	2.7	6	3	2.5
M3.5	0.6	TBJ05226	TCJ05226	TDJ05226	12	56	20	4	3	6	3	2.9
M4	0.7	TBJ05246	TCJ05246	TDJ05246	13	63	21	4.5	3.4	6	3	3.3
M4.5	0.75	TBJ05266	TCJ05266	TDJ05266	14	70	25	6	4.9	8	3	3.7
M5	0.8	TBJ05286	TCJ05286	TDJ05286	15	70	25	6	4.9	8	3	4.2
M6	1.0	TBJ05316	TCJ05316	TDJ05316	17	80	30	6	4.9	8	3	5
M7	1.0	TBJ05346	TCJ05346	TDJ05346	17	80	30	7	5.5	8	3	6
M8	1.25	TBJ05366	TCJ05366	TDJ05366	20	90	35	8	6.2	9	3	6.8
M9	1.25	TBJ05396	TCJ05396	TDJ05396	20	90	35	9	7	10	3	7.8
M10	1.5	TBJ05426	TCJ05426	TDJ05426	22	100	39	10	8	11	3	8.5
M11	1.5	TBJ05466	TCJ05466	TDJ05466	22	100	40	8	6.2	9	3	9.5
M12	1.75	TBJ05506	TCJ05506	TDJ05506	24	110	44	9	7	10	3	10.2
M14	2.0	TBJ05546	TCJ05546	TDJ05546	26	110	44	11	9	12	3	12
M16	2.0	TBJ05606	TCJ05606	TDJ05606	27	110	44	12	9	12	3	14
M18	2.5	TBJ05656	TCJ05656	TDJ05656	30	125	50	14	11	14	4	15.5
M20	2.5	TBJ05706	TCJ05706	TDJ05706	32	140	54	16	12	15	4	17.5
M22	2.5	TBJ05746	TCJ05746	TDJ05746	32	140	54	18	14.5	17	4	19.5
M24	3.0	TBJ05786	TCJ05786	TDJ05786	34	160	60	18	14.5	17	4	21
M27	3.0	TBJ05866	TCJ05866	TDJ05866	36	160	60	20	16	19	4	24
M30	3.5	TBJ05946	TCJ05946	TDJ05946	40	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ The other coating(TiCN or TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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YG-1 CO., LTD.

COMBO TAP

Vap **TBJ07 SERIES**
Bright **TCJ07 SERIES**
TiN **TDJ07 SERIES**

M ISO Metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

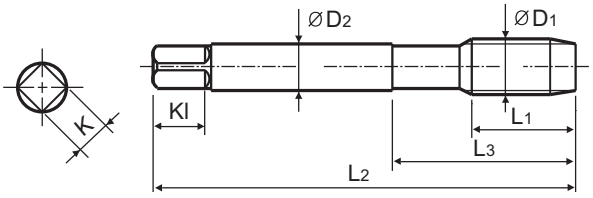
Machine taps
Maschinengewindebohrer

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

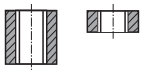
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

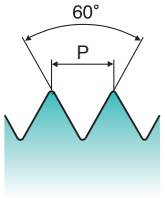
DIN 371

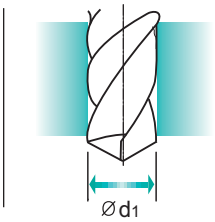
DIN 376



Hole type
3.0×D







Material groups **MU** | HSS-E | DIN 371/376 | 6G | 60° | B | Vap Bright TiN

p.B131

Unit : mm

SIZE ØD1	Pitch P	EDP No. Vap	Bright	TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
M2	0.4	-	TCJ07136	-	8	45	13	2.8	2.1	5	3	1.6
M2.2	0.45	TBJ07156	TCJ07156	TDJ07156	8	45	13	2.8	2.1	5	3	1.75
M2.3	0.4	TBJ07196	TCJ07196	TDJ07196	8	45	13	2.8	2.1	5	3	1.9
M2.5	0.45	-	TCJ07176	TDJ07176	9	50	15	2.8	2.1	5	3	2.05
M2.6	0.45	TBJ07496	TCJ07496	TDJ07496	9	50	15	2.8	2.1	5	3	2.1
M3	0.5	TBJ07206	TCJ07206	TDJ07206	11	56	18	3.5	2.7	6	3	2.5
M3.5	0.6	TBJ07226	TCJ07226	TDJ07226	12	56	20	4	3	6	3	2.9
M4	0.7	TBJ07246	TCJ07246	TDJ07246	13	63	21	4.5	3.4	6	3	3.3
M4.5	0.75	TBJ07266	TCJ07266	TDJ07266	14	70	25	6	4.9	8	3	3.7
M5	0.8	TBJ07286	TCJ07286	TDJ07286	15	70	25	6	4.9	8	3	4.2
M6	1.0	TBJ07316	TCJ07316	TDJ07316	17	80	30	6	4.9	8	3	5
M7	1.0	TBJ07346	TCJ07346	TDJ07346	17	80	30	7	5.5	8	3	6
M8	1.25	TBJ07366	TCJ07366	TDJ07366	20	90	35	8	6.2	9	3	6.8
M9	1.25	TBJ07396	TCJ07396	-	20	90	35	9	7	10	3	7.8
M10	1.5	TBJ07426	TCJ07426	TDJ07426	22	100	39	10	8	11	3	8.5
M11	1.5	TBJ07466	TCJ07466	TDJ07466	22	100	40	8	6.2	9	3	9.5
M12	1.75	TBJ07506	TCJ07506	TDJ07506	24	110	44	9	7	10	3	10.2
M14	2.0	-	TCJ07546	TDJ07546	26	110	44	11	9	12	3	12
M16	2.0	TBJ07606	TCJ07606	TDJ07606	27	110	44	12	9	12	3	14
M18	2.5	TBJ07656	TCJ07656	TDJ07656	30	125	50	14	11	14	4	15.5
M20	2.5	-	TCJ07706	TDJ07706	32	140	54	16	12	15	4	17.5
M22	2.5	TBJ07746	TCJ07746	TDJ07746	32	140	54	18	14.5	17	4	19.5
M24	3.0	TBJ07786	TCJ07786	-	34	160	60	18	14.5	17	4	21
M27	3.0	TBJ07866	TCJ07866	TDJ07866	36	160	60	20	16	19	4	24
M30	3.5	TBJ07946	TCJ07946	TDJ07946	40	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ The other coating(TiCN or TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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YG-1 CO., LTD.

COMBO TAP

Vap **TB854 SERIES**
Bright **TC854 SERIES**
TiN **TD854 SERIES**

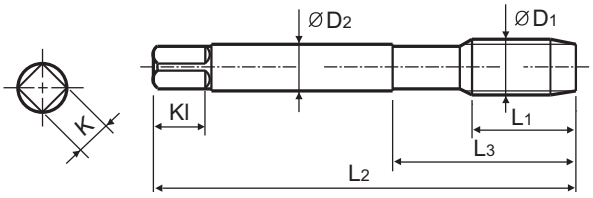
MF ISO Metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

Machine taps
Maschinengewindebohrer

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.



Hole type
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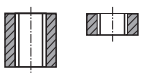

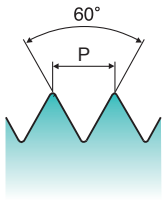

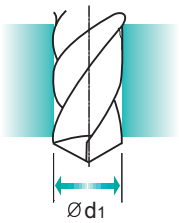

Material groups **MU** | HSS-E | DIN 374 | 6H | 60° | B | Vap Bright TiN

p.B131

Unit : mm

SIZE ØD1	Pitch P	EDP No. Vap	Bright	TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
M4 ×	0.5	TB854256	TC854256	-	10	63	21	2.8	2.1	5	3	3.5
M5 ×	0.5	-	TC854296	TD854296	11	70	25	3.5	2.7	6	3	4.5
M6 ×	0.75	TB854326	TC854326	TD854326	13	80	30	4.5	3.4	6	3	5.2
M6 ×	0.5	TB854336	TC854336	-	13	80	30	4.5	3.4	6	3	5.5
M7 ×	0.75	TB854356	TC854356	TD854356	14	80	30	5.5	4.3	7	3	6.2
M8 ×	1.0	TB854376	TC854376	TD854376	17	90	36	6	4.9	8	3	7
M8 ×	0.75	TB854386	TC854386	TD854386	14	80	30	6	4.9	8	3	7.2
M10 ×	1.25	TB854436	TC854436	TD854436	22	100	40	7	5.5	8	3	8.8
M10 ×	1.0	TB854446	TC854446	TD854446	18	90	36	7	5.5	8	3	9
M10 ×	0.75	-	TC854456	TD854456	18	90	36	7	5.5	8	3	9.2
M12 ×	1.5	TB854516	TC854516	TD854516	22	100	40	9	7	10	3	10.5
M12 ×	1.25	TB854526	TC854526	TD854526	22	100	40	9	7	10	3	10.8
M12 ×	1.0	-	TC854536	TD854536	18	100	40	9	7	10	3	11
M14 ×	1.5	TB854556	TC854556	TD854556	22	100	40	11	9	12	3	12.5
M14 ×	1.25	TB854566	TC854566	TD854566	22	100	40	11	9	12	3	12.8
M14 ×	1.0	TB854576	TC854576	TD854576	22	100	40	11	9	12	3	13
M16 ×	1.5	TB854616	TC854616	TD854616	22	100	40	12	9	12	3	14.5
M16 ×	1.0	TB854626	TC854626	TD854626	18	100	40	12	9	12	3	15
M18 ×	1.5	TB854676	TC854676	TD854676	25	110	44	14	11	14	4	16.5
M18 ×	1.0	TB854686	TC854686	TD854686	20	110	44	14	11	14	4	17
M20 ×	1.5	TB854726	TC854726	TD854726	25	125	50	16	12	15	4	18.5
M20 ×	1.0	TB854736	TC854736	TD854736	20	125	50	16	12	15	4	19

▶ The other coating(TiCN or TiAlN) is available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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YG-1 CO., LTD.

COMBO TAP

Vap **TB854** SERIES
Bright **TC854** SERIES
TiN **TD854** SERIES

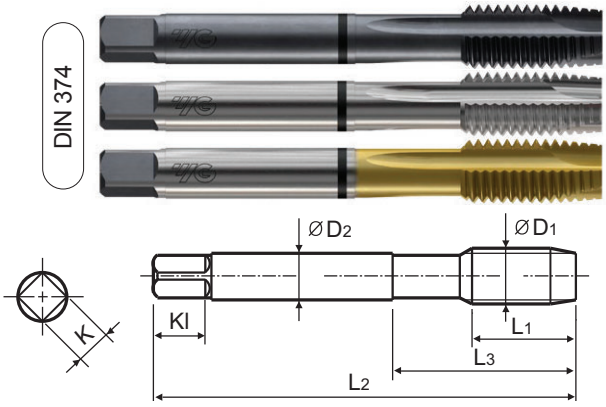
MF ISO Metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

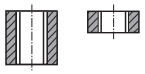
Machine taps
Maschinengewindebohrer

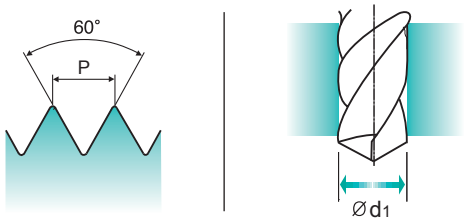
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.



Hole type
3.0×D





Material groups **MU** | HSS-E | DIN 374 | 6H | 60° | B | Vap Bright TiN

p.B131

Unit : mm

SIZE	Pitch	EDP No.			Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	Bright	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M42 x	3.0	-	TC854D06	TD854D06	45	200	80	32	24	27	4	39.0
M42 x	2.0	-	TC854D16	TD854D16	33	170	70	32	24	27	4	40.0
M42 x	1.5	-	TC854D26	TD854D26	33	170	70	32	24	27	4	40.5
M45 x	1.5	-	TC854D96	TD854D96	33	180	80	36	29	32	4	43.5
M48 x	3.0	-	TC854E56	TD854E56	45	225	90	36	29	32	4	45.0
M48 x	2.0	-	TC854E66	TD854E66	36	190	80	36	29	32	4	46.0
M48 x	1.5	-	TC854E76	TD854E76	36	190	80	36	29	32	4	46.5
M50 x	1.5	-	TC854F16	TD854F16	36	190	80	36	29	32	4	48.5
M52 x	3.0	-	TC854F56	TD854F56	45	225	90	40	32	35	4	49.0
M52 x	2.0	-	TC854F66	TD854F66	36	190	80	40	32	35	4	50.0
M52 x	1.5	-	TC854F76	TD854F76	36	190	80	40	32	35	4	50.5

▶ The other coating(TiCN or TiAlN) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COMBO TAP

Bright **TCJ09** SERIES
TiN **TDJ09** SERIES

MF ISO Metric fine threads DIN 13

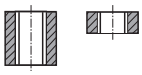
Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

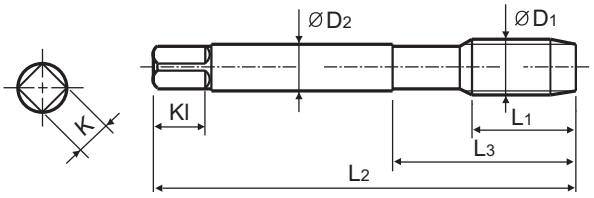
Machine taps
Maschinengewindebohrer

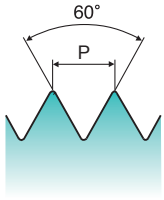
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

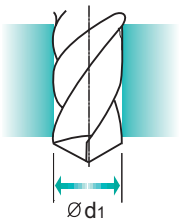
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

Hole type
3.0×D









Material groups **MU** | HSS-E | DIN 374 | 6G | 60° | B | TiN | Bright

p.B131

Unit : mm

SIZE	Pitch	EDP No.		Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M22 ×	1.5	TCJ09766	TDJ09766	25	125	50	18	14.5	17	4	20.5
M22 ×	1.0	TCJ09776	TDJ09776	20	125	50	18	14.5	17	4	21
M24 ×	2.0	TCJ09796	TDJ09796	27	140	54	18	14.5	17	4	22
M24 ×	1.5	TCJ09806	TDJ09806	27	140	54	18	14.5	17	4	22.5
M26 ×	1.5	TCJ09856	TDJ09856	28	140	54	18	14.5	17	4	24.5
M27 ×	2.0	TCJ09876	TDJ09876	28	140	54	20	16	19	4	25
M27 ×	1.5	-	-	28	140	54	20	16	19	4	25.5
M28 ×	1.5	TCJ09916	TDJ09916	28	140	54	20	16	19	4	26.5
M30 ×	2.0	TCJ09966	TDJ09966	30	150	57	22	18	21	4	28
M30 ×	1.5	-	TDJ09976	30	150	57	22	18	21	4	28.5

▶ The other coating(TiCN or TiAlN) or Surface Treatment(Steam Homo) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

COMBO TAP

TC445 SERIES

M ISO Metric coarse threads DIN 13

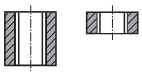
Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

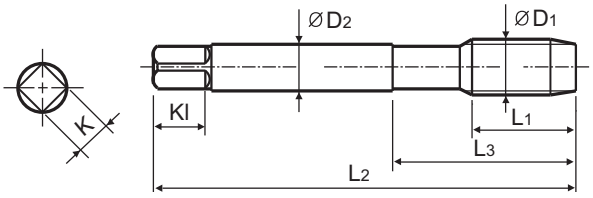
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

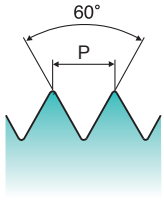
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

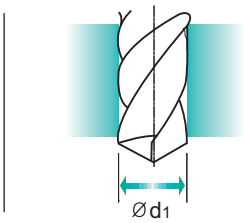
Hole type
3.0×D



Long Shank







Material groups **MU** | HSS-E | LONG | 6H | 60° | B | Bright

p.B131

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3 ×	0.5	TC445206	11	100	18	3.5	2.7	6	3	2.5
M4 ×	0.7	TC445246	13	125	21	4.5	3.4	6	3	3.3
M5 ×	0.8	TC445286	15	140	25	6	4.9	8	3	4.2
M6 ×	1.0	TC445316	17	160	30	6	4.9	8	3	5
M8 ×	1.25	TC445366	20	180	35	6	4.9	8	3	6.8
M10 ×	1.5	TC445426	22	200	39	7	5.5	8	3	8.5
M12 ×	1.75	TC445506	24	220	44	9	7	10	3	10.2
M14 ×	2.0	TC445546	26	220	44	11	9	12	3	12
M16 ×	2.0	TC445606	27	220	44	12	9	12	3	14
M20 ×	2.5	TC445706	32	280	54	16	12	15	4	17.5

▶ Coating(TiN, TiCN or TiAlN) or Surface Treatment(Steam Homo) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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YG-1 CO., LTD.

COMBO TAP

Bright **TCJ01** SERIES
TiN **TDJ01** SERIES

UNC

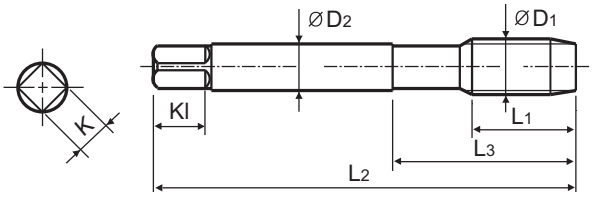
Unified coarse threads

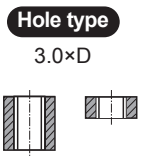
Unified Grobgewinde
UNC
Unificato passo grosso

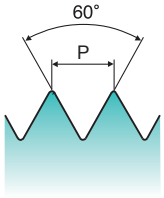
Machine taps
Maschinengewindebohrer

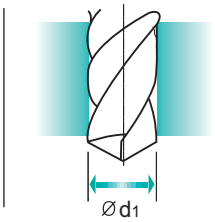
▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.









Material groups **MU** | HSS-E | DIN 371/376 | 3B | 60° | B | TiN | Bright

p.B131

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	EDP No. TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	40 UNC	TCJ01162	TDJ01162	11	56	18	3.5	2.7	6	3	2.3
#5	40 UNC	TCJ01202	TDJ01202	11	56	18	3.5	2.7	6	3	2.6
#6	32 UNC	TCJ01242	TDJ01242	12	56	20	4	3	6	3	2.85
#8	32 UNC	TCJ01282	-	13	63	21	4.5	3.4	6	3	3.5
#10	24 UNC	TCJ01322	TDJ01322	15	70	25	6	4.9	8	3	3.9
#12	24 UNC	TCJ01362	TDJ01362	16	80	30	6	4.9	8	3	4.5
1/4	20 UNC	TCJ01402	TDJ01402	17	80	30	7	5.5	8	3	5.2
5/16	18 UNC	TCJ01442	TDJ01442	20	90	35	8	6.2	9	3	6.6
3/8	16 UNC	TCJ01482	-	22	100	39	9	7	10	3	8
7/16	14 UNC	TCJ01522	TDJ01522	22	100	40	8	6.2	9	3	9.4
1/2	13 UNC	TCJ01562	TDJ01562	25	110	44	9	7	10	3	10.75
9/16	12 UNC	TCJ01602	TDJ01602	26	110	44	11	9	12	3	12.25
5/8	11 UNC	TCJ01642	TDJ01642	27	110	44	12	9	12	3	13.5
3/4	10 UNC	TCJ01702	TDJ01702	30	125	50	14	11	14	4	16.5
7/8	9 UNC	TCJ01742	TDJ01742	32	140	54	18	14.5	17	4	19.5
1	8 UNC	TCJ01782	TDJ01782	36	160	60	20	16	19	4	22.25

▶ DIN 371(#4~3/8) and DIN 376(7/16~1)
▶ The other coating(TiCN or TiAlN) or Surface Treatment(Steam Homo) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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YG-1 CO., LTD.

COMBO TAP

Bright **TCJ02 SERIES**
TiN **TDJ02 SERIES**

UNF

Unified fine threads

Unified Grobgewinde
UNF
Unificato passo fine

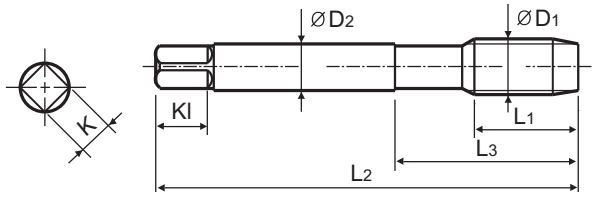
Machine taps
Maschinengewindebohrer

▶ For using multi-purpose and correct thread profiles & long tool life due to special tap geometry. YG-1 company has a patent.

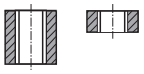
▶ Für vielfältigen Einsatz, genaue Gewindeprofile und lange Standzeitendank einer besonderen Schneidengeometrie. Von YG-1 patentiert.

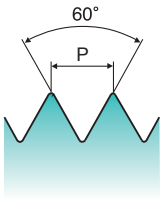
DIN 371

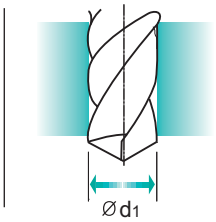
DIN 374



Hole type
3.0×D







Material groups **MU** | HSS-E | DIN 371/374 | 3B | 60° | B | TiN | Bright

p.B131

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	EDP No. TiN	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	48 UNF	TCJ02182	TDJ02182	11	56	18	3.5	2.7	6	3	2.4
#5	44 UNF	TCJ02222	TDJ02222	11	56	18	3.5	2.7	6	3	2.7
#6	40 UNF	TCJ02262	TDJ02262	12	56	20	4	3	6	3	3
#8	36 UNF	TCJ02302	TDJ02302	13	63	21	4.5	3.4	6	3	3.5
#10	32 UNF	TCJ02342	TDJ02342	15	70	25	6	4.9	8	3	4.1
#12	28 UNF	TCJ02382	TDJ02382	16	80	30	6	4.9	8	3	4.7
1/4	28 UNF	TCJ02422	-	17	80	30	7	5.5	8	3	5.5
5/16	24 UNF	TCJ02462	-	17	90	35	8	6.2	9	3	6.9
3/8	24 UNF	TCJ02502	TDJ02502	18	100	39	9	7	10	3	8.5
7/16	20 UNF	TCJ02542	-	22	100	40	8	6.2	9	3	9.9
1/2	20 UNF	TCJ02582	-	22	100	40	9	7	10	3	11.5
9/16	18 UNF	TCJ02622	TDJ02622	22	100	40	11	9	12	3	12.9
5/8	18 UNF	TCJ02662	TDJ02662	22	100	40	12	9	12	3	14.5
3/4	16 UNF	TCJ02722	TDJ02722	25	110	44	14	11	14	4	17.5
7/8	14 UNF	TCJ02762	TDJ02762	26	125	50	18	14.5	17	4	20.5
1	12 UNF	TCJ02802	TDJ02802	28	140	54	20	16	19	4	23.25

▶ DIN 371(#4~3/8) and DIN 374(7/16~1)
▶ The other coating(TiCN or TiAlN) or Surface Treatment(Steam Homo) is available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	◎	◎	◎	◎	○		◎	◎	◎	◎	◎	◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended			◎			◎	◎	◎													

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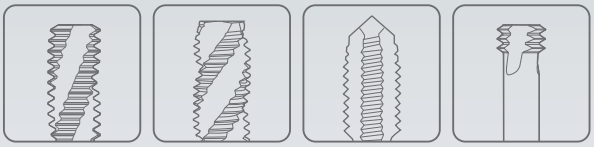
COMBO TAP

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

ISO	VDI 3323	Material Description	HB	HRc	TC804 TC844 TC824 TC864	TD804 TD844 TD824 TD864	TB804 TB844 TB824 TB864	TCE05 TCE09 TCE01 TCE02	TDE05 TDE09 TDE01 TDE02	TBE05	TCE06	TDE06	TBE06
					Vc (m/min.)								
P	1	Non-alloy steel	125		15-20	20-25	15-20	15-20	20-25	15-20	15-20	20-25	15-20
	2		190	13	15-20	20-25	15-20	15-20	20-25	15-20	15-20	20-25	15-20
	3		250	25	12-18	18-24	12-18	12-18	18-24	12-18	12-18	18-24	12-18
	4		270	28	10-15	15-20	10-15	10-15	15-20	10-15	10-15	15-20	10-15
	5		300	32	6-10	10-14	6-10	6-10	10-14	6-10	6-10	10-14	6-10
	6	Low alloy steel	180	10	10-15	15-20	10-15	10-15	15-20	10-15	10-15	15-20	10-15
	7		275	29	10-15	15-20	10-15	10-15	15-20	10-15	10-15	15-20	10-15
	8		300	32	6-10	10-14	6-10	6-10	10-14	6-10	6-10	10-14	6-10
	9		350	38	3-5	5-7	3-5	3-5	5-7	3-5	3-5	5-7	3-5
	10	High alloyed steel, and tool steel	200	15	3-5	5-7	3-5	3-5	5-7	3-5	3-5	5-7	3-5
M	12	Stainless steel	200	15	7-10	10-15	7-10	7-10	10-15	7-10	7-10	10-15	7-10
	13		240	23	5-8	8-11	5-8	5-8	8-11	5-8	5-8	8-11	5-8
	14		180	10	4-6	6-8	4-6	4-6	6-8	4-6	4-6	6-8	4-6
K	15	Grey cast iron	180	10	10-15	15-20	10-15	10-15	15-20	10-15	10-15	15-20	10-15
	16		260	26	5-8	8-11	5-8	5-8	8-11	5-8	5-8	8-11	5-8
	17	Nodular cast iron	160	3	10-15	15-20	10-15	10-15	15-20	10-15	10-15	15-20	10-15
	18		250	25	5-8	8-11	5-8	5-8	8-11	5-8	5-8	8-11	5-8
N	23	Aluminum-cast, alloyed	75		15-20	20-25	15-20	15-20	20-25	15-20	15-20	20-25	15-20
	26	Copper and Copper Alloys (Bronze / Brass)	110		25-35	35-40	25-35	25-35	35-40	25-35	25-35	35-40	25-35
	27		90		8-12	12-17	8-12	8-12	12-17	8-12	8-12	12-17	8-12
	28		100		15-20	20-25	15-20	15-20	20-25	15-20	15-20	20-25	15-20

ISO	VDI 3323	Material Description	HB	HRc	TCE07	TDE07	TBE07	TCE08	TDE08	TBE08	TC804-IC	TC633	TC807
					Vc (m/min.)								
P	1	Non-alloy steel	125		15-20	20-25	15-20	15-20	20-25	15-20	15-20	15-20	15-20
	2		190	13	15-20	20-25	15-20	15-20	20-25	15-20	15-20	15-20	15-20
	3		250	25	12-18	18-24	12-18	12-18	18-24	12-18	12-18	12-18	12-18
	4		270	28	10-15	15-20	10-15	10-15	15-20	10-15	10-15	10-15	10-15
	5		300	32	6-10	10-14	6-10	6-10	10-14	6-10	6-10	6-10	6-10
	6	Low alloy steel	180	10	10-15	15-20	10-15	10-15	15-20	10-15	10-15	10-15	10-15
	7		275	29	10-15	15-20	10-15	10-15	15-20	10-15	10-15	10-15	10-15
	8		300	32	6-10	10-14	6-10	6-10	10-14	6-10	6-10	6-10	6-10
	9		350	38	3-5	5-7	3-5	3-5	5-7	3-5	3-5	3-5	3-5
	10	High alloyed steel, and tool steel	200	15	3-5	5-7	3-5	3-5	5-7	3-5	3-5	3-5	3-5
M	12	Stainless steel	200	15	7-10	10-15	7-10	7-10	10-15	7-10	7-10	7-10	7-10
	13		240	23	5-8	8-11	5-8	5-8	8-11	5-8	5-8	5-8	5-8
	14		180	10	4-6	6-8	4-6	4-6	6-8	4-6	4-6	4-6	4-6
K	15	Grey cast iron	180	10	10-15	15-20	10-15	10-15	15-20	10-15	10-15	10-15	10-15
	16		260	26	5-8	8-11	5-8	5-8	8-11	5-8	5-8	5-8	5-8
	17	Nodular cast iron	160	3	10-15	15-20	10-15	10-15	15-20	10-15	10-15	10-15	10-15
	18		250	25	5-8	8-11	5-8	5-8	8-11	5-8	5-8	5-8	5-8
N	23	Aluminum-cast, alloyed	75		15-20	20-25	15-20	15-20	20-25	15-20	15-20	15-20	15-20
	26	Copper and Copper Alloys (Bronze / Brass)	110		25-35	35-40	25-35	25-35	35-40	25-35	25-35	25-35	25-35
	27		90		8-12	12-17	8-12	8-12	12-17	8-12	8-12	8-12	8-12
	28		100		15-20	20-25	15-20	15-20	20-25	15-20	15-20	15-20	15-20

Global Cutting Tool Leader **YG-1**



THREADING

Leading Through Innovation

HSS-E & HSS-PM

YG TAP STEEL

YG Gewindebohrer Stähle

- **For Steel Materials but also other Long Chip Forming Materials**
- **Für Stahlwerkstoffe, aber auch andere langspanende Werkstoffe**

SELECTION GUIDE

YG THREADING TOOLS

HSS-E & HSS-PM
YG TAP STEEL

For Steel Materials but also other Long Chip Forming Materials

HOLE TYPE			Max. 2.5xD Blind Hole			
TOOL MATERIAL			HSS-PM		HSS-E	
CHAMFER LEAD ACC. TO DIN2197			C	C	C	C
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute
SPIRAL FLUTE ANGLE			R40	R40	R40	R40
SERIES	M	DIN371/376	TQ823 (p.B136)	TR823 (p.B137)	TC312 (p.B138)	TD312 (p.B139)
		DIN352				
		DIN357/LONG				
	MF	DIN374			TC413 (p.B142)	TD413 (p.B143)
		DIN2181				
	UNC	DIN371/376			TC174 (p.B144)	TD174 (p.B145)
		DIN351				
	UNF	DIN371/374			TC184 (p.B146)	
		DIN2181				
	BSW	DIN2182/2183				
		DIN351				
	G(BSP)	DIN5156/5157				
	EG-M	DIN371/376				
	EG-UNC	DIN371/376				
	EG-UNF	DIN371/374				
SURFACE TREATMENT			VAP	Bright	Bright	TiN
MODEL						

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◎ : Excellent ○ : Good

Recommended cutting conditions : p.B159

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125					
	2		About 0.45% C	Annealed	190	13	○	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	○
	4		About 0.75% C	Annealed	270	28	○	○	○	○
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	○	○	○	○
	7			Quenched & Tempered	275	29	○	○	○	○
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○
	11			Quenched & Tempered	325	35				
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10	○	○	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

YG TAP STEEL

TQ823 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

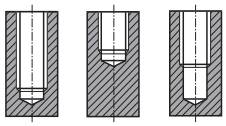
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

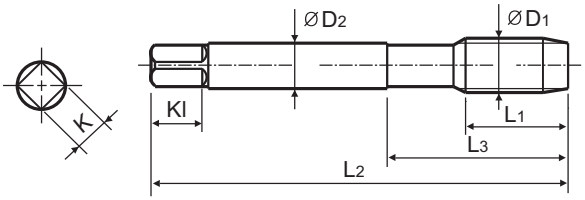
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

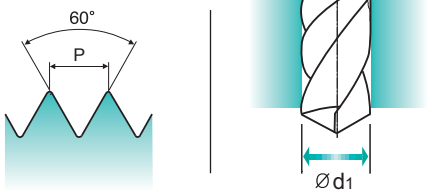
DIN 371

DIN 376

Hole type
2.5×D







Material groups **VG** | HSS PM | DIN 371/376 | 6H | 60° | C | R40 | Vap

p.B159

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2.5	× 0.45	**TQ823176**	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	**TQ823206**	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	**TQ823226**	7	56	20	4	3	6	3	2.9
M4	× 0.7	**TQ823246**	7	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	**TQ823266**	8	70	25	6	4.9	8	3	3.7
M5	× 0.8	**TQ823286**	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	**TQ823316**	10	80	30	6	4.9	8	3	5
M8	× 1.25	**TQ823366**	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	**TQ823426**	15	100	39	10	8	11	3	8.5
M12	× 1.75	**TQ823506**	18	110	44	9	7	10	3	10.2

▶ DIN 371(M2~M10) and DIN 376(M12)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○				○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

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YG-1 CO., LTD.

YG TAP STEEL

TC312 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

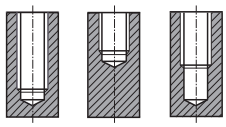
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

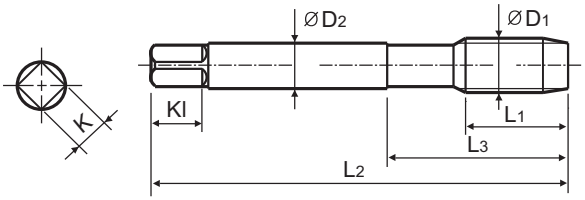
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

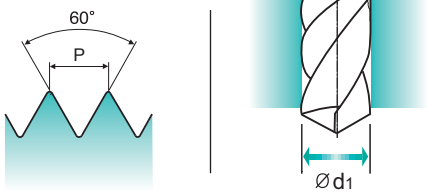
DIN 371

DIN 376

Hole type
2.5×D







Material groups VG | HSS-E | DIN 371/376 | 6H | 60° | C | R40 | Bright

p.B159

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TC312136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TC312156	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	TC312196	8	45	13	2.8	2.1	5	3	1.9
M2.5	× 0.45	TC312176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TC312496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TC312206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TC312226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TC312246	7	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TC312266	8	70	25	6	4.9	8	3	3.7
M5	× 0.8	TC312286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TC312316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TC312346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TC312366	13	90	35	8	6.2	9	3	6.8
M9	× 1.25	TC312396	13	90	35	9	7	10	3	7.8
M10	× 1.5	TC312426	15	100	39	10	8	11	3	8.5
M11	× 1.5	TC312466	17	100	40	8	6.2	9	3	9.5
M12	× 1.75	TC312506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TC312546	20	110	44	11	9	12	3	12
M16	× 2.0	TC312606	20	110	44	12	9	12	3	14
M18	× 2.5	TC312656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TC312706	25	140	54	16	12	15	4	17.5
M24	× 3.0	TC312786	30	160	60	18	14.5	17	4	21
M27	× 3.0	TC312866	30	160	60	20	16	19	4	24
M30	× 3.5	TC312946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○				○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG TAP STEEL

TB312 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

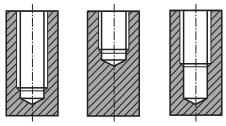
▶ Suitable for threading blind holes due to excellent chip evacuation of tempered steels or similar work materials.

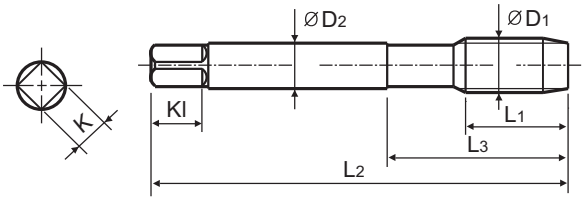
▶ Geeignet zum Gewinden von Sacklöchern dank ausgezeichneter Spanabfuhr von angelassenen Stählen oder ähnlichen Werkstoffen.

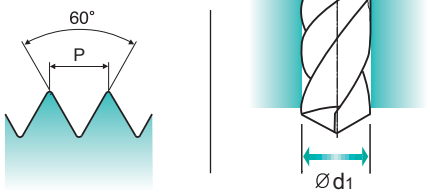
DIN 371

DIN 376

Hole type
2.5×D







Material groups **VG** | HSS-E | DIN 371/376 | 6H | 60° | C | R40 | Vap | p.B159

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TB312136	8	45	13	2.8	2.1	5	3	1.6
M2.5	× 0.45	TB312176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TB312206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TB312226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TB312246	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TB312286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TB312316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TB312346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TB312366	13	90	35	8	6.2	9	3	6.8
M9	× 1.25	TB312396	13	90	35	9	7	10	3	7.8
M10	× 1.5	TB312426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TB312506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TB312546	20	110	44	11	9	12	3	12
M16	× 2.0	TB312606	20	110	44	12	9	12	3	14
M18	× 2.5	TB312656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TB312706	25	140	54	16	12	15	4	17.5
M22	× 2.5	TB312746	25	140	54	18	14.5	17	4	19.5
M24	× 3.0	TB312786	30	160	60	18	14.5	17	4	21
M30	× 3.5	TB312946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○				○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TC413 SERIES

MF ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

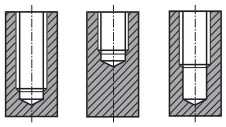
Machine taps
Maschinengewindebohrer

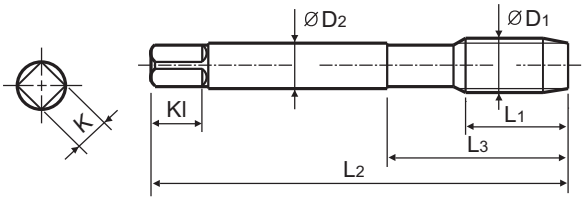
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

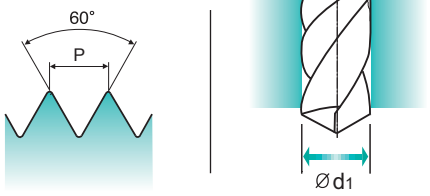
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

DIN 374

Hole type
2.5×D







Material groups **VG** | HSS-E | DIN 374 | 6H | 60° | C | R40 | Bright

p.B159

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M4	× 0.5	TC413256	5	63	21	2.8	2.1	5	3	3.5
M5	× 0.5	TC413296	5	70	25	3.5	2.7	6	3	4.5
M6	× 0.75	TC413326	8	80	30	4.5	3.4	6	3	5.2
M6	× 0.5	TC413336	5	80	30	4.5	3.4	6	3	5.5
M8	× 1.0	TC413376	10	90	36	6	4.9	8	3	7
M8	× 0.75	TC413386	8	80	30	6	4.9	8	3	7.2
M10	× 1.25	TC413436	16	100	40	7	5.5	8	3	8.8
M10	× 1.0	TC413446	10	90	36	7	5.5	8	3	9
M10	× 0.75	TC413456	10	90	36	7	5.5	8	3	9.2
M12	× 1.5	TC413516	15	100	40	9	7	10	3	10.5
M12	× 1.25	TC413526	15	100	40	9	7	10	3	10.8
M12	× 1.0	TC413536	11	100	40	9	7	10	3	11
M14	× 1.5	TC413556	15	100	40	11	9	12	3	12.5
M14	× 1.25	TC413566	15	100	40	11	9	12	3	12.8
M16	× 1.5	TC413616	15	100	40	12	9	12	3	14.5
M18	× 1.5	TC413676	17	110	44	14	11	14	4	16.5
M20	× 1.5	TC413726	17	125	50	16	12	15	4	18.5
M22	× 1.5	TC413766	17	125	50	18	14.5	17	4	20.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○				○						

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TC174 SERIES

UNC Unified coarse threads

Unified Grobgewinde
UNC
Unificato passo grosso

Machine taps
Maschinengewindebohrer

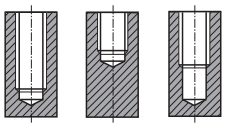
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

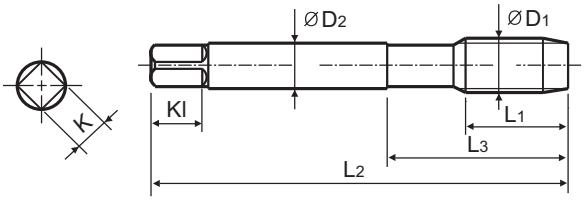
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

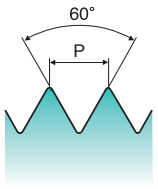
DIN 371

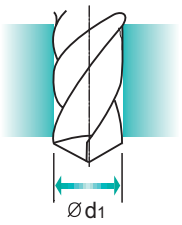
DIN 376

Hole type
2.5×D









Material groups **VG** | HSS-E | DIN 371/376 | 2B | 60° | C | R40 | Bright

p.B159

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	- 40UNC	TC174162	6	56	18	3.5	2.7	6	3	2.3
#6	- 32UNC	TC174242	7	56	20	4	3	6	3	2.85
#8	- 32UNC	TC174282	8	63	21	4.5	3.4	6	3	3.5
#10	- 24UNC	TC174322	10	70	25	6	4.9	8	3	3.9
#12	- 24UNC	TC174362	10	80	30	6	4.9	8	3	4.5
1/4	- 20UNC	TC174402	13	80	30	7	5.5	8	3	5.2
5/16	- 18UNC	TC174442	14	90	35	8	6.2	9	3	6.6
3/8	- 16UNC	TC174482	16	100	39	9	7	10	3	8
1/2	- 13UNC	TC174562	20	110	44	9	7	10	3	10.75
9/16	- 12UNC	TC174602	20	110	44	11	9	12	3	12.25
5/8	- 11UNC	TC174642	22	110	44	12	9	12	3	13.5
3/4	- 10UNC	TC174702	25	125	50	14	11	14	4	16.5

▶ DIN 371(#4~3/8) and DIN 376(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○				○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TC184 SERIES

UNF

Unified fine threads

- Unified Feingewinde
- UNF
- Unificato passo fine

Machine taps
Maschinengewindebohrer

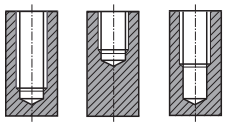
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

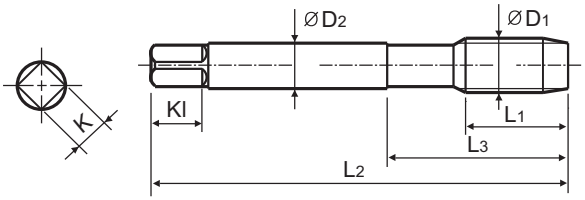
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

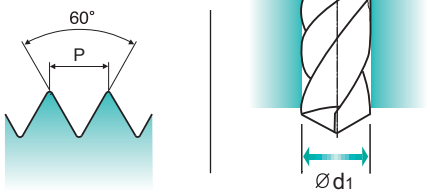
DIN 371

DIN 374

Hole type
2.5×D







Material groups **VG** | HSS-E | DIN 371/374 | 2B | 60° | C | R40 | Bright

p.B159

Unit : mm

SIZE	TPI	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1		Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
#4	- 48UNF	TC184182	6	56	18	3.5	2.7	6	3	2.4
#5	- 44UNF	TC184222	7	56	18	3.5	2.7	6	3	2.7
#6	- 40UNF	TC184262	7	56	20	4	3	6	3	3
#10	- 32UNF	TC184342	10	70	25	6	4.9	8	3	4.1
#12	- 28UNF	TC184382	10	80	30	6	4.9	8	3	4.7
1/4	- 28UNF	TC184422	10	80	30	7	5.5	8	3	5.5
5/16	- 24UNF	TC184462	10	90	35	8	6.2	9	3	6.9
3/8	- 24UNF	TC184502	10	100	39	9	7	10	3	8.5
1/2	- 20UNF	TC184582	13	100	40	9	7	10	3	11.5
5/8	- 18UNF	TC184662	15	100	40	12	9	12	3	14.5
3/4	- 16UNF	TC184722	17	110	44	14	11	14	4	17.5
7/8	- 14UNF	TC184762	17	125	50	18	14.5	17	4	20.5
1	- 12UNF	TC184802	20	140	54	18	14.5	17	4	23.25

▶ DIN 371(#4~3/8) and DIN 374(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○				○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TQ863 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

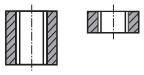
▶ Suitable for through hole in more cutting speed than other taps due to thick web and the best substrate.

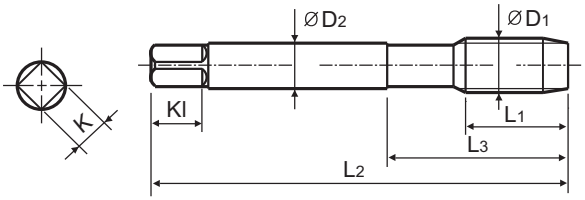
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke und bestem Werkstoff.

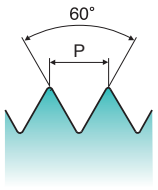
DIN 371

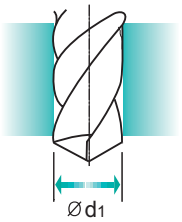
DIN 376

Hole type
3.0×D









Material groups **VG** | HSS PM | DIN 371/376 | 6H | 60° | B | Vap

p.B159

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TQ863136	8	45	13	2.8	2.1	5	3	1.6
M3	× 0.5	TQ863206	11	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	TQ863246	13	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TQ863266	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	TQ863286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TQ863316	17	80	30	6	4.9	8	3	5
M8	× 1.25	TQ863366	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	TQ863426	22	100	39	10	8	11	3	8.5
M12	× 1.75	TQ863506	24	110	44	9	7	10	3	10.2

▶ DIN 371(M2~M10) and DIN 376(M12)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○		○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TC422 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

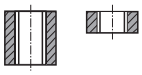
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

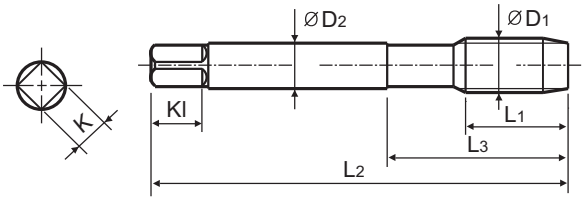
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

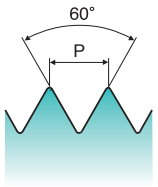
DIN 371

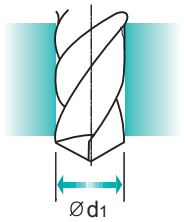
DIN 376

Hole type
3.0×D









Material groups **VG** | HSS-E | DIN 371/376 | 6H | 60° | B | Bright

p.B159

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TC422136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TC422156	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	TC422196	8	45	13	2.8	2.1	5	3	1.9
M2.5	× 0.45	TC422176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TC422496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TC422206	11	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	TC422246	13	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TC422266	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	TC422286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TC422316	17	80	30	6	4.9	8	3	5
M7	× 1.0	TC422346	17	80	30	7	5.5	8	3	6
M8	× 1.25	TC422366	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	TC422426	22	100	39	10	8	11	3	8.5
M11	× 1.5	TC422466	22	100	40	8	6.2	9	3	9.5
M12	× 1.75	TC422506	24	110	44	9	7	10	3	10.2
M14	× 2.0	TC422546	26	110	44	11	9	12	3	12
M16	× 2.0	TC422606	27	110	44	12	9	12	3	14
M18	× 2.5	TC422656	30	125	50	14	11	14	4	15.5
M20	× 2.5	TC422706	32	140	54	16	12	15	4	17.5
M22	× 2.5	TC422746	32	140	54	18	14.5	17	4	19.5
M24	× 3.0	TC422786	34	160	60	18	14.5	17	4	21
M27	× 3.0	TC422866	36	160	60	20	16	19	4	24
M30	× 3.5	TC422946	40	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○		○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TE422 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

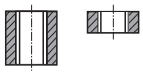
▶ Recommended for tapping abrasive materials due to nitriding, not suitable for tapping tough or high strength materials.

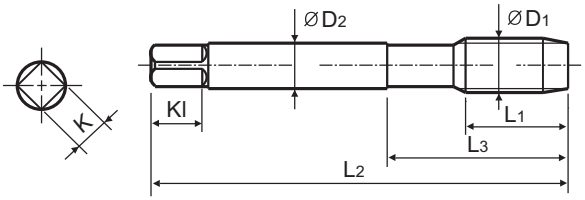
▶ Empfohlen für das Gewindeschneiden verschleißfordernder Werkstoffe wegen der Nitrierung; nicht geeignet für das Gewinden zaher oder hochfester Werkstoffe.

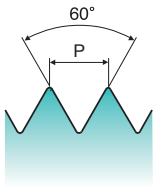
DIN 371

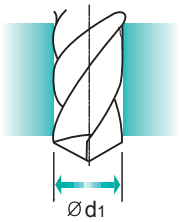
DIN 376

Hole type
3.0×D









Material groups **VG** | HSS-E | DIN 371/376 | 6H | 60° | B | Nitride | p.B159

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Ni	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TE422136	8	45	13	2.8	2.1	5	3	1.6
M3	× 0.5	TE422206	11	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	TE422246	13	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TE422286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TE422316	17	80	30	6	4.9	8	3	5
M7	× 1.0	TE422346	17	80	30	7	5.5	8	3	6
M8	× 1.25	TE422366	20	90	35	8	6.2	9	3	6.8
M9	× 1.25	TE422396	20	90	35	9	7	10	3	7.8
M10	× 1.5	TE422426	22	100	39	10	8	11	3	8.5
M12	× 1.75	TE422506	24	110	44	9	7	10	3	10.2
M14	× 2.0	TE422546	26	110	44	11	9	12	3	12
M16	× 2.0	TE422606	27	110	44	12	9	12	3	14
M20	× 2.5	TE422706	32	140	54	16	12	15	4	17.5
M22	× 2.5	TE422746	32	140	54	18	14.5	17	4	19.5
M27	× 3.0	TE422866	36	160	60	20	16	19	4	24
M30	× 3.5	TE422946	40	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○		○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TC263 SERIES

MF

ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

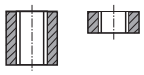
Machine taps
Maschinengewindebohrer

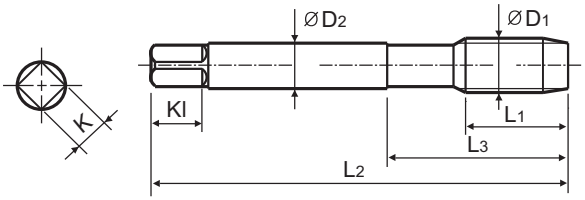
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

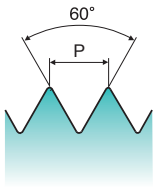
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

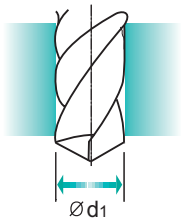
DIN 374

Hole type
3.0×D









Material groups VG | HSS-E | DIN 374 | 6H | 60° | B | Bright

p.B159

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M5	× 0.5	TC263296	11	70	25	3.5	2.7	6	3	4.5
M7	× 0.75	TC263356	14	80	30	5.5	4.3	7	3	6.2
M8	× 1.0	TC263376	17	90	36	6	4.9	8	3	7
M8	× 0.75	TC263386	14	80	30	6	4.9	8	3	7.2
M10	× 1.25	TC263436	22	100	40	7	5.5	8	3	8.8
M10	× 1.0	TC263446	18	90	36	7	5.5	8	3	9
M10	× 0.75	TC263456	18	90	36	7	5.5	8	3	9.2
M12	× 1.5	TC263516	22	100	40	9	7	10	3	10.5
M12	× 1.25	TC263526	22	100	40	9	7	10	3	10.8
M12	× 1.0	TC263536	18	100	40	9	7	10	3	11
M14	× 1.5	TC263556	22	100	40	11	9	12	3	12.5
M24	× 1.5	TC263806	27	140	54	18	14.5	17	4	22.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○		○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TC244 SERIES

UNC Unified coarse threads

Unified Grobgewinde
UNC
Unificato passo grosso

Machine taps
Maschinengewindebohrer

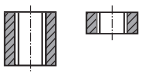
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

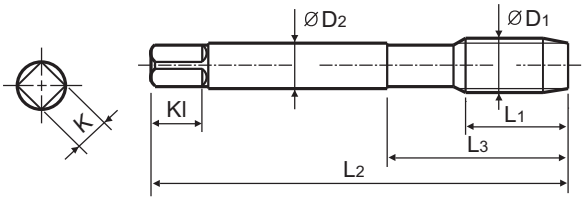
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

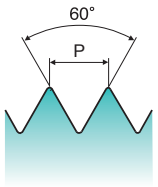
DIN 371

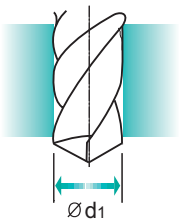
DIN 376

Hole type
3.0×D









Material groups **VG** | HSS-E | DIN 371/376 | 2B | 60° | B | Bright

p.B159

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#5	- 40UNC	**TC244202**	11	56	18	3.5	2.7	6	3	2.6
#6	- 32UNC	**TC244242**	12	56	20	4	3	6	3	2.85
#10	- 24UNC	**TC244322**	15	70	25	6	4.9	8	3	3.9
#12	- 24UNC	**TC244362**	16	80	30	6	4.9	8	3	4.5
1/4	- 20UNC	**TC244402**	17	80	30	7	5.5	8	3	5.2
5/16	- 18UNC	**TC244442**	20	90	35	8	6.2	9	3	6.6
3/8	- 16UNC	**TC244482**	22	100	39	9	7	10	3	8
1/2	- 13UNC	**TC244562**	25	110	44	9	7	10	3	10.75
5/8	- 11UNC	**TC244642**	27	110	44	12	9	12	3	13.5
7/8	- 9UNC	**TC244742**	32	140	54	18	14.5	17	4	19.5
1	- 8UNC	**TC244782**	36	160	60	20	16	19	4	22.25

▶ DIN 371(#4~3/8) and DIN 376(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○		○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											○					○					

YG TAP STEEL

TC254 SERIES

UNF

Unified fine threads

Unified Feingewinde
UNF
Unificato passo fine

Machine taps
Maschinengewindebohrer

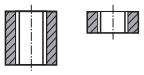
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

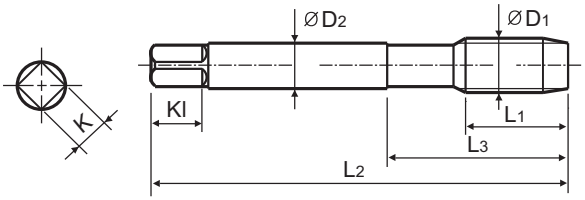
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

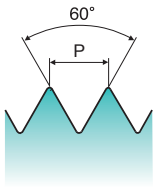
DIN 371

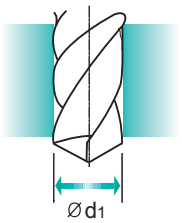
DIN 374

Hole type
3.0×D









Material groups **VG** | HSS-E | DIN 371/374 | 2B | 60° | B | Bright

p.B159

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#5	- 44UNF	TC254222	11	56	18	3.5	2.7	6	3	2.7
#10	- 32UNF	TC254342	15	70	25	6	4.9	8	3	4.1
1/4	- 28UNF	TC254422	17	80	30	7	5.5	8	3	5.5
3/8	- 24UNF	TC254502	18	100	39	9	7	10	3	8.5
9/16	- 18UNF	TC254622	22	100	40	11	9	12	3	12.9
3/4	- 16UNF	TC254722	25	110	44	14	11	14	4	17.5
1	- 12UNF	TC254802	28	140	54	18	14.5	17	4	23.25

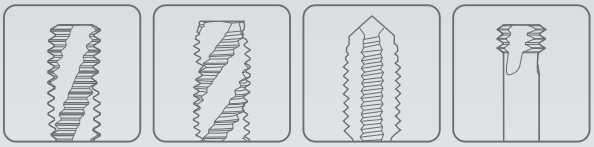
▶ DIN 371(#4~3/8) and DIN 374(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		○	○	○	◎	○	○	◎	◎	○		○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

Global Cutting Tool Leader **YG-1**



THREADING

Leading Through Innovation

HSS-E

YG TAP CHIP BREAKER

YG Gewindebohrer Chip Breaker

- TiN Coated Tap with Chip Breaker for Steel Materials
- TiN-beschichteter Gewindebohrer mit Spanbrecher für Stahlwerkstoffe

SELECTION GUIDE

YG THREADING TOOLS

HSS-E YG TAP CHIP BREAKER

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B169

HOLE TYPE			Max. 2.0xD Blind Hole		
TOOL MATERIAL			HSS-E		
CHAMFER LEAD ACC. TO DIN2197			C	E	C
FLUTE TYPE			Spiral Flute		
SPIRAL FLUTE ANGLE			R15		
SERIES	M	DIN371/376	TDE24 (p.B163)	TDE26 (p.B165)	TDE28 (p.B167)
	MF	DIN374	TDE25 (p.B164)	TDE27 (p.B166)	TDE29 (p.B168)
SURFACE TREATMENT			TiN		
MODEL					

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28			
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○
	11			Quenched & Tempered	325	35	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10			
	16		Pearlitic (Martensitic)		260	26			
	17	Nodular cast iron	Ferritic		160	3			
	18		Pearlitic		250	25			
	19	Malleable cast iron	Ferritic		130				
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

YG TAP CHIP BREAKER

TDE25 SERIES

MF ISO Metric Fine Threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

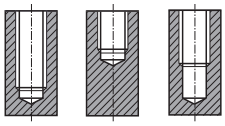
Machine taps
Maschinengewindebohrer

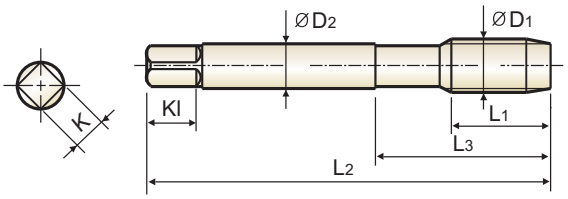
- Solving the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel

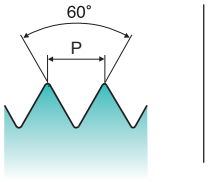
- Lösung des durch lange Späne verursachten Produktivitätsproblems
- Besonders geeignet für die Bearbeitung von unlegiertem Stahl, niedriglegiertem Stahl, hochlegiertem Stahl und Werkzeugstahl

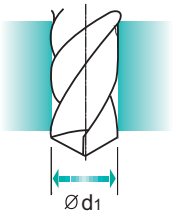
DIN 374

Hole type
2.0×D









Material groups **VG** | HSS-E | DIN 374 | 6H | 60° | C | R15° | TiN

p.B169

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M8	× 1.0	TDE25376R	10	90	36	6	4.9	8	3	7.0
M10	× 1.25	TDE25436R	16	100	40	7	5.5	8	3	8.8
M10	× 1.0	TDE25446R	10	90	36	7	5.5	8	3	9.0
M12	× 1.5	TDE25516R	15	100	40	9	7.0	10	3	10.5
M12	× 1.25	TDE25526R	15	100	40	9	7.0	10	3	10.8
M14	× 1.5	TDE25556R	15	100	40	11	9.0	12	3	12.5
M16	× 1.5	TDE25616R	15	100	40	12	9.0	12	3	14.5
M18	× 1.5	TDE25676R	17	110	44	14	11.0	14	4	16.5
M20	× 1.5	TDE25726R	17	125	50	16	12.0	15	4	18.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended																					

YG TAP CHIP BREAKER

TDE27 SERIES

MF ISO Metric Fine Threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

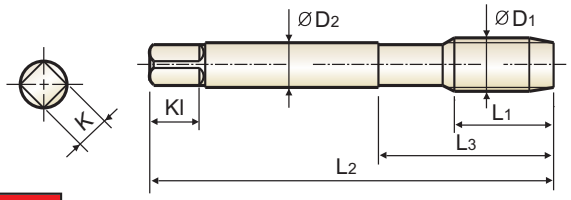
Machine taps
Maschinengewindebohrer

- Solving the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel

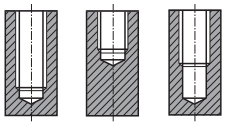
- Lösung des durch lange Späne verursachten Produktivitätsproblems
- Besonders geeignet für die Bearbeitung von unlegiertem Stahl, niedriglegiertem Stahl, hochlegiertem Stahl und Werkzeugstahl

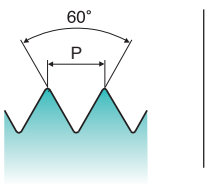
DIN 374

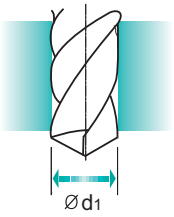
Short Chamfer



Hole type
2.0×D







Material groups **VG** | HSS-E | DIN 374 | 6H | 60° | E | R15° | TiN

p.B169

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M8	× 1.0	TDE27376R	10	90	36	6	4.9	8	3	7.0
M10	× 1.25	TDE27436R	16	100	40	7	5.5	8	3	8.8
M10	× 1.0	TDE27446R	10	90	36	7	5.5	8	3	9.0
M12	× 1.5	TDE27516R	15	100	40	9	7.0	10	3	10.5
M12	× 1.25	TDE27526R	15	100	40	9	7.0	10	3	10.8
M14	× 1.5	TDE27556R	15	100	40	11	9.0	12	3	12.5
M16	× 1.5	TDE27616R	15	100	40	12	9.0	12	3	14.5
M18	× 1.5	TDE27676R	17	110	44	14	11.0	14	4	16.5
M20	× 1.5	TDE27726R	17	125	50	16	12.0	15	4	18.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended																					

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YG-1 CO., LTD.

YG TAP CHIP BREAKER

TDE29 SERIES

MF ISO Metric Fine Threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

Machine taps
Maschinengewindebohrer

- Solving the productivity problem caused by long chips.
- Particularly suitable for machining non-alloy steel, low alloy steel, high alloy steel, and tool steel

- Lösung des durch lange Späne verursachten Produktivitätsproblems
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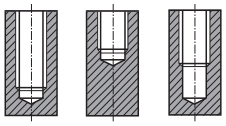
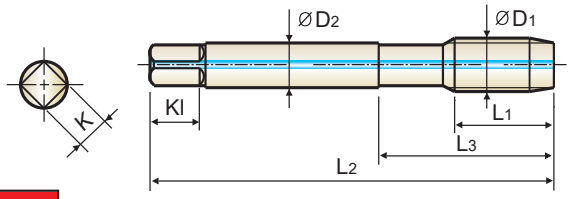
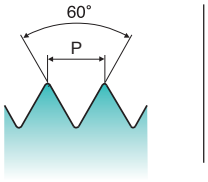
DIN 374

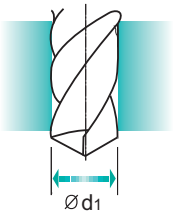
with Internal Coolant

Hole type
2.0×D









Material groups **VG** | 6H | 60° | C | R15° | TiN

p.B169

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M8	× 1.0	TDE29376R	10	90	36	6	4.9	8	3	7.0
M10	× 1.25	TDE29436R	16	100	40	7	5.5	8	3	8.8
M10	× 1.0	TDE29446R	10	90	36	7	5.5	8	3	9.0
M12	× 1.5	TDE29516R	15	100	40	9	7.0	10	3	10.5
M12	× 1.25	TDE29526R	15	100	40	9	7.0	10	3	10.8
M14	× 1.5	TDE29556R	15	100	40	11	9.0	12	3	12.5
M16	× 1.5	TDE29616R	15	100	40	12	9.0	12	3	14.5
M18	× 1.5	TDE29676R	17	110	44	14	11.0	14	4	16.5
M20	× 1.5	TDE29726R	17	125	50	16	12.0	15	4	18.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎			○	◎	◎	○	○	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended																					

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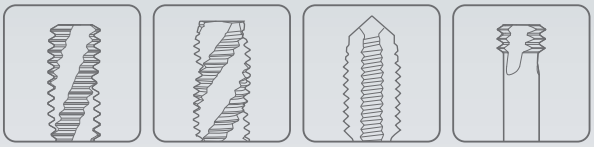
YG-1 CO., LTD.

Global Cutting Tool Leader **YG-1**



THREADING

Leading Through Innovation

HSS-E & HSS-PM

YG TAP INOX

YG Gewindebohrer INOX

- **For Stainless Steels with Lamellar, Irregular Chip Formation where the Cutting Forces are Higher**
- **Für nichtrostende Stähle mit lamellarer, unregelmäßiger Spänebildung, bei denen die Schnittkräfte größer sind.**

SELECTION GUIDE

YG THREADING TOOLS

HSS-E & HSS-PM
YG TAP INOX

For Stainless Steels with Lamellar, Irregular Chip Formation where the Cutting Forces are Higher

HOLE TYPE			Max. 2.0xD Blind Hole	Max. 2.5xD Blind Hole		
TOOL MATERIAL			HSS-E	HSS-PM		HSS-E
CHAMFER LEAD ACC. TO DIN2197			C	C	C	C
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Flute	Spiral Flute
SPIRAL FLUTE ANGLE			R40	R40	R40	R40
SERIES	M	DIN371/376	TB711 (p.B174)	TQ813 (p.B175)	TR813 (p.B176)	TB914 (p.B177)
		DIN352				
		DIN357/LONG				
	MF	DIN374				TB183 (p.B187)
		DIN2181				
	UNC	DIN371/376				TB904 (p.B188)
		DIN351				
	UNF	DIN371/374				TB924 (p.B189)
		DIN2181				
	BSW	DIN2182/2183				
		DIN351				
	G(BSP)	DIN5156/5157				
	EG-M	DIN371/376				
	EG-UNC	DIN371/376				
	EG-UNF	DIN371/374				
SURFACE TREATMENT			VAP	VAP	Bright	VAP
MODEL						

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B193

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	○	○	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25		○	○	○
	4		About 0.75% C	Annealed	270	28		○	○	○
	5		About 0.75% C	Quenched & Tempered	300	32				
	6	Low alloy steel		Annealed	180	10		○	○	○
	7			Quenched & Tempered	275	29				
	8			Quenched & Tempered	300	32				
	9			Quenched & Tempered	350	38				
	10	High alloyed steel, and tool steel		Annealed	200	15				
	11			Quenched & Tempered	325	35				
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	○	◎	◎	◎
	14		Austenitic		180	10	○	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60		○			
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100		○			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		○	○	○
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm			○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

YG TAP INOX

TB711 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

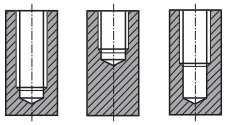
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

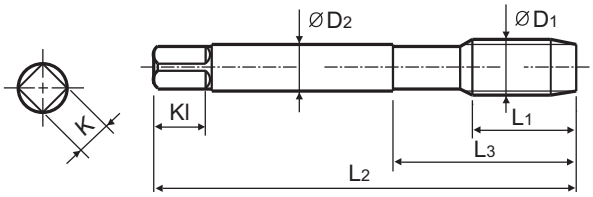
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

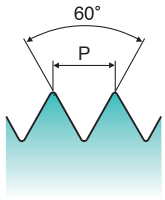
DIN 371

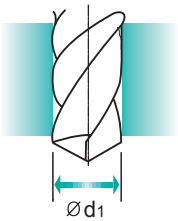
DIN 376

Hole type
2.0×D









Material groups **NW** | HSS-E | DIN 371/376 | 6H | 60° | C | R40 | Vap | p.B193

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TB711136	8	45	13	2.8	2.1	5	3	1.6
M2.5	× 0.45	TB711176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TB711206	6	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	TB711246	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TB711286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TB711316	10	80	30	6	4.9	8	3	5
M8	× 1.25	TB711366	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TB711426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TB711506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TB711546	20	110	44	11	9	12	3	12
M18	× 2.5	TB711656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TB711706	25	140	54	16	12	15	4	17.5
M24	× 3.0	TB711786	30	160	60	18	14.5	17	4	21
M30	× 3.5	TB711946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎										○	○	○						

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○							○													

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YG-1 CO., LTD.

YG TAP INOX

TR813 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

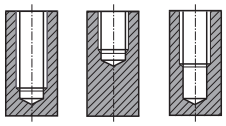
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

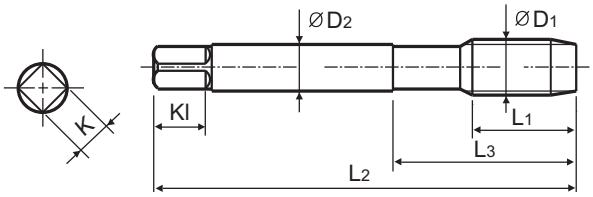
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

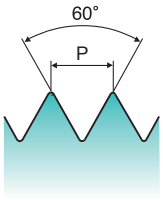
DIN 371

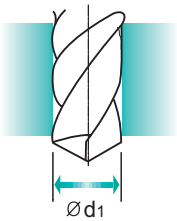
DIN 376

Hole type
2.5×D









Material groups **VA** | HSS PM | DIN 371/376 | 6H | 60° | C | R40 | Bright

p.B193

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TR813136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TR813156	8	45	13	2.8	2.1	5	3	1.75
M2.5	× 0.45	TR813176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TR813206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TR813226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TR813246	7	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TR813266	8	70	25	6	4.9	8	3	3.7
M5	× 0.8	TR813286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TR813316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TR813346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TR813366	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TR813426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TR813506	18	110	44	9	7	10	3	10.2

▶ DIN 371(M2~M10) and DIN 376(M12)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

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YG-1 CO., LTD.

YG TAP INOX

TBE15 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

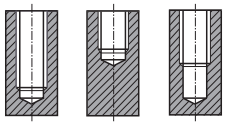
- With recessed threads for machine tapping of deep blind holes.
- Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

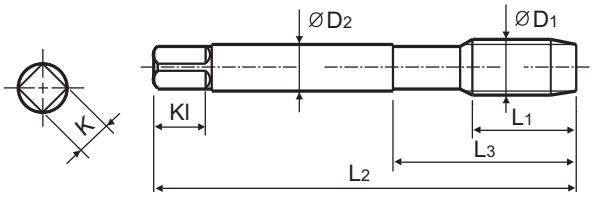
- Mit abgesetztem Gewinde zum Schneiden von tiefen Sacklochgewinden.
- Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

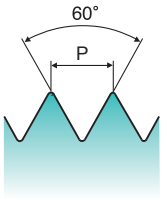
DIN 371

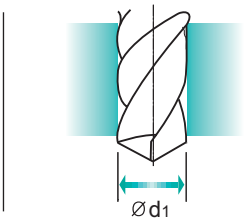
DIN 376

Hole type
2.5×D









Material groups VA NW | HSS-E | DIN 371/376 | 4H | 60° | C | R40 | Vap

p.B193

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TBE15136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TBE15156	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	TBE15196	8	45	13	2.8	2.1	5	3	1.9
M2.5	× 0.45	TBE15176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TBE15496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TBE15206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TBE15226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TBE15246	7	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TBE15266	8	70	25	6	4.9	8	3	3.7
M5	× 0.8	TBE15286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TBE15316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TBE15346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TBE15366	13	90	35	8	6.2	9	3	6.8
M9	× 1.25	TBE15396	13	90	35	9	7	10	3	7.8
M10	× 1.5	TBE15426	15	100	39	10	8	11	3	8.5
M11	× 1.5	TBE15466	17	100	40	8	6.2	9	3	9.5
M12	× 1.75	TBE15506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TBE15546	20	110	44	11	9	12	3	12
M16	× 2.0	TBE15606	20	110	44	12	9	12	3	14
M18	× 2.5	TBE15656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TBE15706	25	140	54	16	12	15	4	17.5
M22	× 2.5	TBE15746	25	140	54	18	14.5	17	4	19.5
M24	× 3.0	TBE15786	30	160	60	18	14.5	17	4	21
M27	× 3.0	TBE15866	30	160	60	20	16	19	4	24
M30	× 3.5	TBE15946	35	180	70	22	18	21	4	26.5

- DIN 371(M2~M10) and DIN 376(M11~M30)
- * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP INOX

TBE17 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

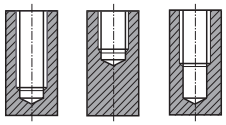
- With recessed threads for machine tapping of deep blind holes.
- Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

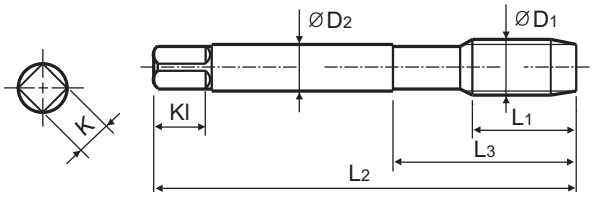
- Mit abgesetztem Gewinde zum Schneiden von tiefen Sacklochgewinden.
- Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

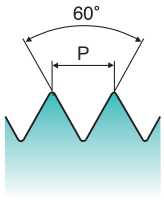
DIN 371

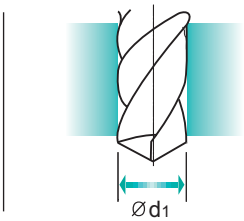
DIN 376

Hole type
2.5×D









Material groups VA NW | HSS-E | DIN 371/376 | 6G | 60° | C | R40 | Vap

p.B193

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2.2	× 0.45	TBE17156	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	TBE17196	8	45	13	2.8	2.1	5	3	1.9
M3	× 0.5	TBE17206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TBE17226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TBE17246	7	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TBE17266	8	70	25	6	4.9	8	3	3.7
M5	× 0.8	TBE17286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TBE17316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TBE17346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TBE17366	13	90	35	8	6.2	9	3	6.8
M9	× 1.25	TBE17396	13	90	35	9	7	10	3	7.8
M10	× 1.5	TBE17426	15	100	39	10	8	11	3	8.5
M11	× 1.5	TBE17466	17	100	40	8	6.2	9	3	9.5
M12	× 1.75	TBE17506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TBE17546	20	110	44	11	9	12	3	12
M16	× 2.0	TBE17606	20	110	44	12	9	12	3	14
M18	× 2.5	TBE17656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TBE17706	25	140	54	16	12	15	4	17.5
M22	× 2.5	TBE17746	25	140	54	18	14.5	17	4	19.5
M24	× 3.0	TBE17786	30	160	60	18	14.5	17	4	21
M27	× 3.0	TBE17866	30	160	60	20	16	19	4	24
M30	× 3.5	TBE17946	35	180	70	22	18	21	4	26.5

- DIN 371(M2~M10) and DIN 376(M11~M30)
- * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											○					○					

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG TAP INOX

TCH14 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

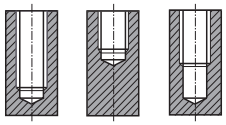
- With recessed threads for machine tapping of deep blind holes.
- Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

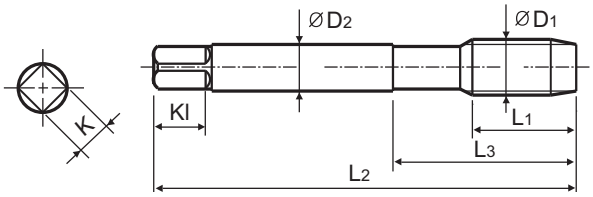
- Mit abgesetztem Gewinde zum Schneiden von tiefen Sacklochgewinden.
- Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

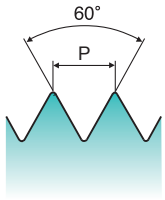
DIN 371

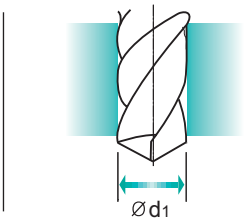
DIN 376

Hole type
2.5×D









Material groups VA NW | HSS-E | DIN 371/376 | 6H | 60° | C | R40 | Hardslick

p.B193

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Hardslick	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TCH14136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TCH14156	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	TCH14196	8	45	13	2.8	2.1	5	3	1.9
M2.5	× 0.45	TCH14176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TCH14496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TCH14206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TCH14226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TCH14246	7	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TCH14266	8	70	25	6	4.9	8	3	3.7
M5	× 0.8	TCH14286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TCH14316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TCH14346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TCH14366	13	90	35	8	6.2	9	3	6.8
M9	× 1.25	TCH14396	13	90	35	9	7	10	3	7.8
M10	× 1.5	TCH14426	15	100	39	10	8	11	3	8.5
M11	× 1.5	TCH14466	17	100	40	8	6.2	9	3	9.5
M12	× 1.75	TCH14506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TCH14546	20	110	44	11	9	12	3	12
M16	× 2.0	TCH14606	20	110	44	12	9	12	3	14
M18	× 2.5	TCH14656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TCH14706	25	140	54	16	12	15	4	17.5
M22	× 2.5	TCH14746	25	140	54	18	14.5	17	4	19.5
M24	× 3.0	TCH14786	30	160	60	18	14.5	17	4	21
M27	× 3.0	TCH14866	30	160	60	20	16	19	4	24
M30	× 3.5	TCH14946	35	180	70	22	18	21	4	26.5

- DIN 371(M2~M10) and DIN 376(M11~M30)
- * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											○					○					

YG TAP INOX

TR853 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

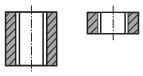
▶ Suitable for through hole in more cutting speed than other taps due to thick web and the best substrate.

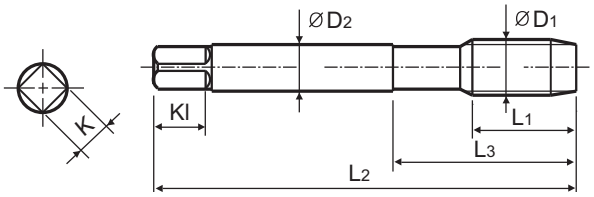
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke und bestem Werkstoff.

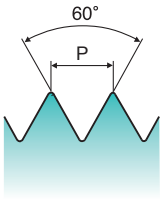
DIN 371

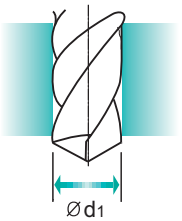
DIN 376

Hole type
3.0×D









Material groups **VA** | HSS PM | DIN 371/376 | 6H | 60° | B | Bright

p.B193

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TR853136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TR853156	8	45	13	2.8	2.1	5	3	1.75
M2.5	× 0.45	TR853176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TR853206	11	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TR853226	12	56	20	4	3	6	3	2.9
M4	× 0.7	TR853246	13	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TR853266	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	TR853286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TR853316	17	80	30	6	4.9	8	3	5
M7	× 1.0	TR853346	17	80	30	7	5.5	8	3	6
M8	× 1.25	TR853366	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	TR853426	22	100	39	10	8	11	3	8.5
M12	× 1.75	TR853506	24	110	44	9	7	10	3	10.2

▶ DIN 371(M2~M10) and DIN 376(M12)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP INOX

TCH23 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

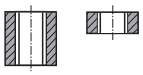
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

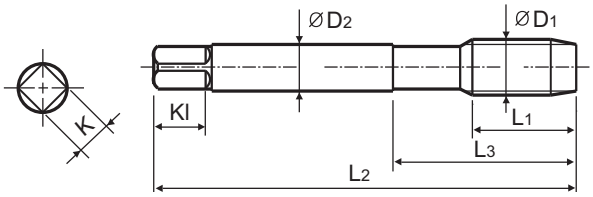
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

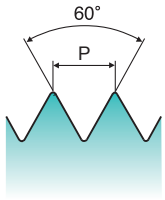
DIN 371

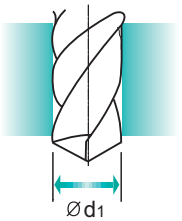
DIN 376

Hole type
3.0×D









Material groups VA NW | HSS-E | DIN 371/376 | 6HX | 60° | B | Hardslick

p.B193

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Hardslick	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TCH23136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TCH23156	8	45	13	2.8	2.1	5	3	1.75
M2.5	× 0.45	TCH23176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TCH23496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TCH23206	11	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TCH23226	12	56	20	4	3	6	3	2.9
M4	× 0.7	TCH23246	13	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TCH23266	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	TCH23286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TCH23316	17	80	30	6	4.9	8	3	5
M7	× 1.0	TCH23346	17	80	30	7	5.5	8	3	6
M8	× 1.25	TCH23366	20	90	35	8	6.2	9	3	6.8
M9	× 1.25	TCH23396	20	90	35	9	7	10	3	7.8
M10	× 1.5	TCH23426	22	100	39	10	8	11	3	8.5
M12	× 1.75	TCH23506	24	110	44	9	7	10	4	10.2
M14	× 2.0	TCH23546	26	110	44	11	9	12	4	12
M16	× 2.0	TCH23606	27	110	44	12	9	12	4	14
M18	× 2.5	TCH23656	30	125	50	14	11	14	4	15.5
M20	× 2.5	TCH23706	32	140	54	16	12	15	4	17.5
M22	× 2.5	TCH23746	32	140	54	18	14.5	17	4	19.5
M24	× 3.0	TCH23786	34	160	60	18	14.5	17	4	21
M27	× 3.0	TCH23866	36	160	60	20	16	19	4	24
M30	× 3.5	TCH23946	40	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

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YG-1 CO., LTD.

YG TAP INOX

TB904 SERIES

UNC

Unified coarse threads

Unified Grobgewinde
UNC
Unificato passo grosso

Machine taps
Maschinengewindebohrer

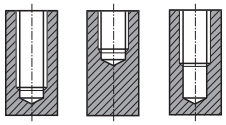
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

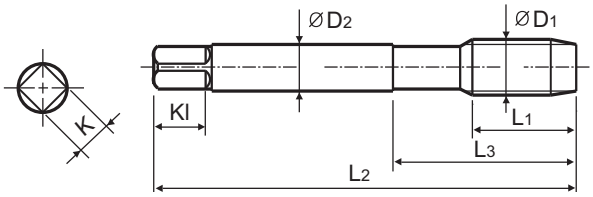
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

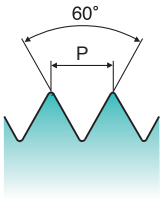
DIN 371

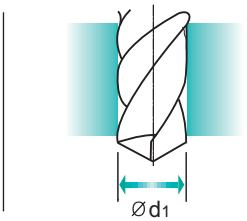
DIN 376

Hole type
2.5×D









Material groups VA NW | HSS-E | DIN 371/376 | 2B | 60° | C | R40 | Vap

p.B193

Unit : mm

SIZE ØD1	TPI	EDP No. Vap	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	40UNC	TB904162	6	56	18	3.5	2.7	6	3	2.3
#5	40UNC	TB904202	7	56	18	3.5	2.7	6	3	2.6
#6	32UNC	TB904242	7	56	20	4	3	6	3	2.85
#10	24UNC	TB904322	10	70	25	6	4.9	8	3	3.9
1/4	20UNC	TB904402	13	80	30	7	5.5	8	3	5.2
5/16	18UNC	TB904442	14	90	35	8	6.2	9	3	6.6
3/8	16UNC	TB904482	16	100	39	9	7	10	3	8
7/16	14UNC	TB904522	17	100	40	8	6.2	9	3	9.4
5/8	11UNC	TB904642	22	110	44	12	9	12	3	13.5
3/4	10UNC	TB904702	25	125	50	14	11	14	4	16.5
1	8UNC	TB904782	30	160	60	20	16	19	4	22.25

▶ DIN 371(#4~3/8) and DIN 376(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG TAP INOX

TB123 SERIES

MF

ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

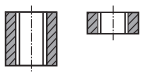
Machine taps
Maschinengewindebohrer

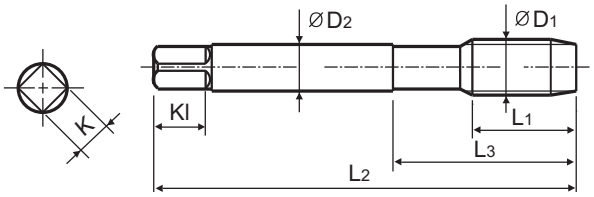
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

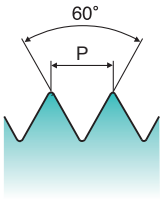
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

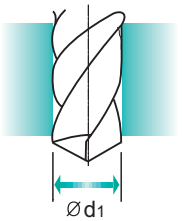
DIN 374

Hole type
3.0×D









Material groups VA NW | HSS-E | DIN 374 | 6HX | 60° | B | Vap

p.B193

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M4	× 0.5	TB123256	10	63	21	2.8	2.1	5	3	3.5
M5	× 0.5	TB123296	11	70	25	3.5	2.7	6	3	4.5
M6	× 0.75	TB123326	13	80	30	4.5	3.4	6	3	5.2
M6	× 0.5	TB123336	13	80	30	4.5	3.4	6	3	5.5
M7	× 0.75	TB123356	14	80	30	5.5	4.3	7	3	6.2
M8	× 1.0	TB123376	17	90	36	6	4.9	8	3	7
M8	× 0.75	TB123386	14	80	30	6	4.9	8	3	7.2
M10	× 1.25	TB123436	22	100	40	7	5.5	8	3	8.8
M10	× 0.75	TB123456	18	90	36	7	5.5	8	3	9.2
M12	× 1.5	TB123516	22	100	40	9	7	10	4	10.5
M12	× 1.25	TB123526	22	100	40	9	7	10	3	10.8
M12	× 1.0	TB123536	18	100	40	9	7	10	3	11
M14	× 1.5	TB123556	22	100	40	11	9	12	3	12.5
M14	× 1.25	TB123566	22	100	40	11	9	12	3	12.8
M16	× 1.5	TB123616	22	100	40	12	9	12	3	14.5
M18	× 1.5	TB123676	25	110	44	14	11	14	4	16.5
M22	× 1.5	TB123766	25	125	50	18	14.5	17	4	20.5
M24	× 1.5	TB123806	27	140	54	18	14.5	17	4	22.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

YG TAP INOX

TB274 SERIES

UNF

Unified fine threads

Unified Feingewinde
UNF
Unificato passo fine

Machine taps
Maschinengewindebohrer

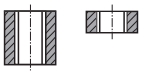
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

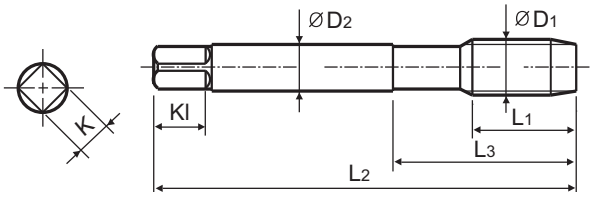
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

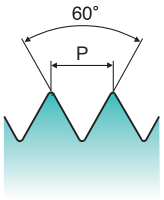
DIN 371

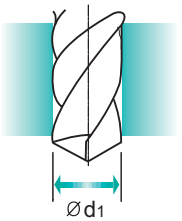
DIN 374

Hole type
3.0×D









Material groups VA NW | HSS-E | DIN 371/374 | 2B | 60° | B | Vap

p.B193

Unit : mm

SIZE ØD1	TPI	EDP No. Vap	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	48UNF	TB274182	11	56	18	3.5	2.7	6	3	2.4
#5	44UNF	TB274222	11	56	18	3.5	2.7	6	3	2.7
#10	32UNF	TB274342	15	70	25	6	4.9	8	3	4.1
1/4	28UNF	TB274422	17	80	30	7	5.5	8	3	5.5
5/16	24UNF	TB274462	17	90	35	8	6.2	9	3	6.9
3/8	24UNF	TB274502	18	100	39	9	7	10	3	8.5
7/16	20UNF	TB274542	22	100	40	8	6.2	9	3	9.9
1/2	20UNF	TB274582	22	100	40	9	7	10	3	11.5
5/8	18UNF	TB274662	22	100	40	12	9	12	3	14.5
3/4	16UNF	TB274722	25	110	44	14	11	14	4	17.5

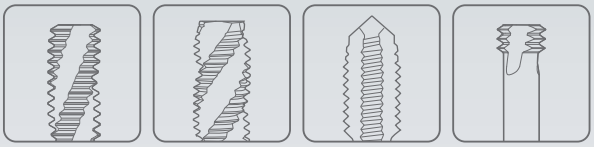
▶ DIN 371(#4~3/8) and DIN 374(7/16~1-1/8)

◎ : Excellent ○ : Good

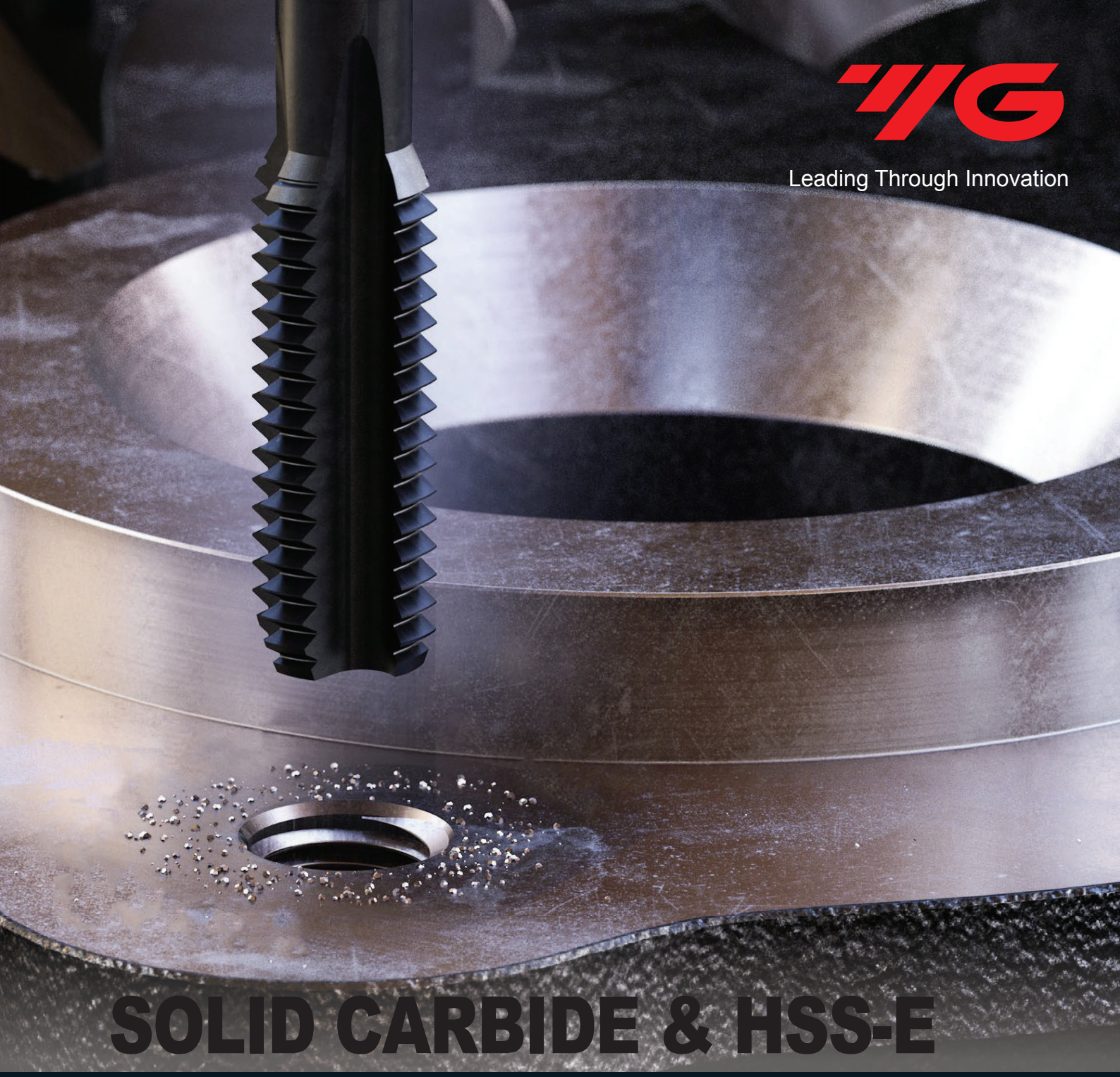
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○		○						◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○					○					

Global Cutting Tool Leader **YG-1**



THREADING



Leading Through Innovation

SOLID CARBIDE & HSS-E

YG TAP CAST IRON

HSS YG Gewindebohrer Guss

- For Cast Iron or Similar Work Materials
- Für Gusseisen oder ähnliche Werkstoffe

SELECTION GUIDE

YG THREADING TOOLS

SOLID CARBIDE & HSS-E
YG TAP
CAST IRON

For Cast Iron or Similar Work Materials

HOLE TYPE			Max. 2.0xD Blind / Through Hole				
TOOL MATERIAL			CARBIDE	HSS-E			
CHAMFER LEAD ACC. TO DIN2197			C	C	C	C	C
FLUTE TYPE			Straight Flute	Straight Flute	Straight Flute	Straight Flute	Straight Flute
SPIRAL FLUTE ANGLE			-	-	-	-	-
SERIES	M	DIN371/376	T0993 (p.B197)	TE821 (p.B198)	TD821 (p.B199)	TI821 (p.B200)	TY821 (p.B201)
		DIN352					
		DIN357/LONG					
	MF	DIN374		TE403 (p.B202)			
		DIN2181					
	UNC	DIN371/376		TE434 (p.B203)			
		DIN351					
	UNF	DIN371/374		TE454 (p.B204)			
		DIN2181					
	BSW	DIN2182/2183					
		DIN351					
	G(BSP)	DIN5156/5157					
	EG-M	DIN371/376					
	EG-UNC	DIN371/376					
	EG-UNF	DIN371/374					
SURFACE TREATMENT			Bright	Nitride	TiN	TiCN	TiAlN
MODEL							

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B205

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc					
P	1	Non-alloy steel	About 0.15% C	Annealed	125						
	2		About 0.45% C	Annealed	190	13					
	3		About 0.45% C	Quenched & Tempered	250	25					
	4		About 0.75% C	Annealed	270	28					
	5		About 0.75% C	Quenched & Tempered	300	32					
	6	Low alloy steel		Annealed	180	10					
	7			Quenched & Tempered	275	29					
	8			Quenched & Tempered	300	32					
	9			Quenched & Tempered	350	38					
	10	High alloyed steel, and tool steel		Annealed	200	15					
	11			Quenched & Tempered	325	35					
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15					
	13		Martensitic	Quenched & Tempered	240	23					
	14		Austenitic		180	10					
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		○	○	○	○	○
	20		Pearlitic		230	21	○	○	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60						
	22		Curable	Hardened	100						
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎				
	24		≤ 12% Si, Curable	Hardened	90						
	25		> 12% Si, Not Curable		130		◎				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						
	27		CuZn, CuSnZn (Brass)		90			○	◎	◎	◎
	28		CuSn, lead-free copper and electrolytic copper		100						
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm						
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55					
	39			Hardened	630	60					
	40	Chilled Cast Iron		Cast	400	42	◎				
	41	Hardened Cast Iron		Hardened	550	55					

YG TAP CAST IRON

TE821 SERIES

M ISO metric coarse threads DIN 13

- Metrisches ISO-Gewinde DIN 13
- ISO MÉTRIQUE DIN13
- ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

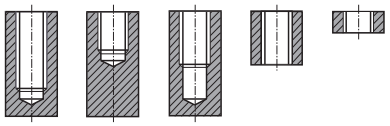
▶ Suitable for tapping cast iron or similar work materials.

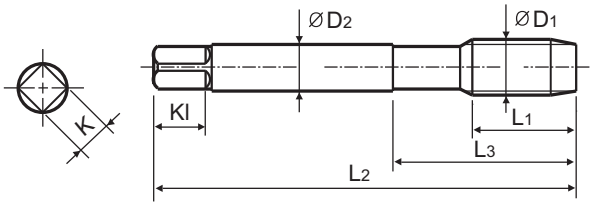
▶ Geeignet zum Gewindeschneiden von Guss oder ähnlichen Werkstoffen

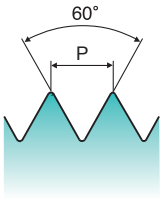
DIN 371

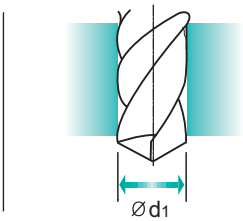
DIN 376

Hole type
2.0×D









Material groups **GG** | HSS-E | DIN 371/376 | 6HX | 60° | C | Nitride

p.B205

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Ni	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TE821136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TE821156	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	TE821196	8	45	13	2.8	2.1	5	3	1.9
M2.5	× 0.45	TE821176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TE821496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TE821206	11	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TE821226	12	56	20	4	3	6	3	2.9
M4	× 0.7	TE821246	13	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TE821266	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	TE821286	15	70	25	6	4.9	8	4	4.2
M6	× 1.0	TE821316	17	80	30	6	4.9	8	4	5
M7	× 1.0	TE821346	17	80	30	7	5.5	8	4	6
M11	× 1.5	TE821466	22	100	40	8	6.2	9	4	9.5
M12	× 1.75	TE821506	24	110	44	9	7	10	4	10.2
M14	× 2.0	TE821546	26	110	44	11	9	12	4	12
M16	× 2.0	TE821606	27	110	44	12	9	12	4	14
M18	× 2.5	TE821656	30	125	50	14	11	14	4	15.5
M20	× 2.5	TE821706	32	140	54	16	12	15	4	17.5
M22	× 2.5	TE821746	32	140	54	18	14.5	17	4	19.5
M24	× 3.0	TE821786	34	160	60	18	14.5	17	4	21
M27	× 3.0	TE821866	36	160	60	20	16	19	4	24
M30	× 3.5	TE821946	40	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended															◎	◎	◎	◎	○	○

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended							○														

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG TAP CAST IRON

TI821 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

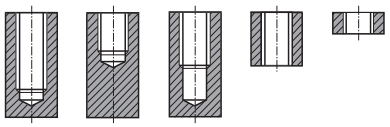
▶ Suitable for tapping cast iron or similar work materials.

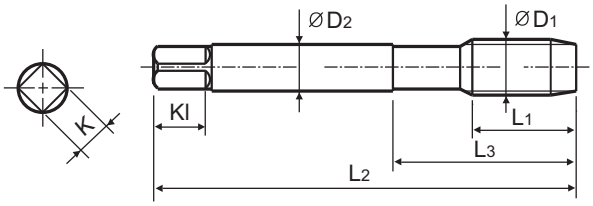
▶ Geeignet zum Gewindeschneiden von Guss oder ähnlichen Werkstoffen

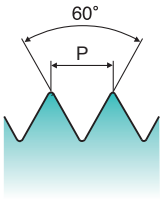
DIN 371

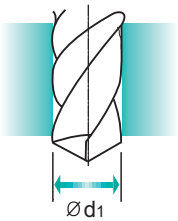
DIN 376

Hole type
2.0×D









Material groups **GG** | HSS-E | DIN 371/376 | 6HX | 60° | C | TiCN

p.B205

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiCN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TI821136	8	45	13	2.8	2.1	5	3	1.6
M2.5	× 0.45	TI821176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TI821206	11	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TI821226	12	56	20	4	3	6	3	2.9
M4	× 0.7	TI821246	13	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TI821286	15	70	25	6	4.9	8	4	4.2
M6	× 1.0	TI821316	17	80	30	6	4.9	8	4	5
M7	× 1.0	TI821346	17	80	30	7	5.5	8	4	6
M8	× 1.25	TI821366	20	90	35	8	6.2	9	4	6.8
M9	× 1.25	TI821396	20	90	35	9	7	10	4	7.8
M10	× 1.5	TI821426	22	100	39	10	8	11	4	8.5
M11	× 1.5	TI821466	22	100	40	8	6.2	9	4	9.5
M12	× 1.75	TI821506	24	110	44	9	7	10	4	10.2
M14	× 2.0	TI821546	26	110	44	11	9	12	4	12
M16	× 2.0	TI821606	27	110	44	12	9	12	4	14
M18	× 2.5	TI821656	30	125	50	14	11	14	4	15.5
M20	× 2.5	TI821706	32	140	54	16	12	15	4	17.5
M22	× 2.5	TI821746	32	140	54	18	14.5	17	4	19.5
M24	× 3.0	TI821786	34	160	60	18	14.5	17	4	21
M27	× 3.0	TI821866	36	160	60	20	16	19	4	24
M30	× 3.5	TI821946	40	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended															◎	◎	◎	◎	○	○

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended							◎														

YG TAP CAST IRON

TE403 SERIES

MF ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

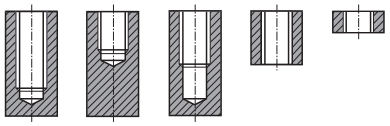
Machine taps
Maschinengewindebohrer

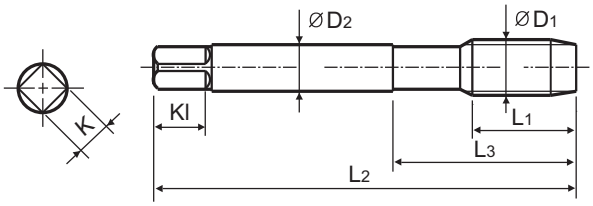
▶ Suitable for tapping cast iron or similar work materials due to nitriding.

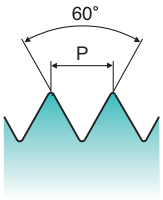
▶ Geeignet zum Gewindeschneiden von Guss oder ähnlichen Werkstoffen dank der Nitrierung

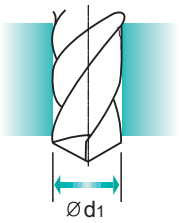
DIN 374

Hole type
2.0×D









Material groups GG | HSS-E | DIN 374 | 6HX | 60° | C | Nitride

p.B205

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Ni	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M4	× 0.5	TE403256	10	63	21	2.8	2.1	5	3	3.5
M5	× 0.5	TE403296	11	70	25	3.5	2.7	6	4	4.5
M6	× 0.75	TE403326	13	80	30	4.5	3.4	6	4	5.2
M6	× 0.5	TE403336	13	80	30	4.5	3.4	6	4	5.5
M7	× 0.75	TE403356	14	80	30	5.5	4.3	7	4	6.2
M8	× 1.0	TE403376	17	90	36	6	4.9	8	4	7
M8	× 0.75	TE403386	14	80	30	6	4.9	8	4	7.2
M10	× 1.0	TE403446	18	90	36	7	5.5	8	4	9
M10	× 0.75	TE403456	18	90	36	7	5.5	8	4	9.2
M12	× 1.25	TE403526	22	100	40	9	7	10	4	10.8
M12	× 1.0	TE403536	18	100	40	9	7	10	4	11
M14	× 1.5	TE403556	22	100	40	11	9	12	4	12.5
M18	× 1.5	TE403676	25	110	44	14	11	14	4	16.5
M20	× 1.5	TE403726	25	125	50	16	12	15	4	18.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended															◎	◎	◎	◎	○	○

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended							○														

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YG-1 CO., LTD.

YG TAP CAST IRON

TE454 SERIES

UNF — Unified fine threads

Unified Feingewinde
UNF
Unificato passo fine

Machine taps
Maschinengewindebohrer

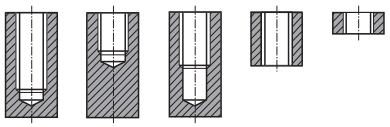
▶ Suitable for tapping cast iron or similar work materials due to nitriding.

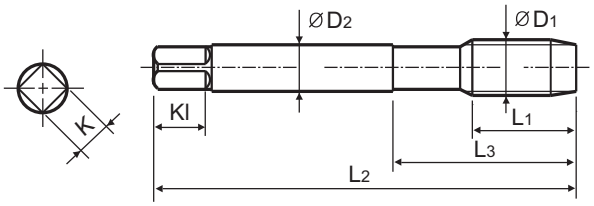
▶ Geeignet zum Gewindeschneiden von Guss oder ähnlichen Werkstoffen dank der Nitrierung

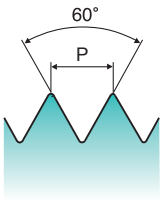
DIN 371

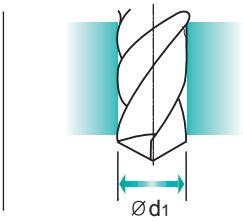
DIN 374

Hole type
2.0×D









Material groups **GG** | HSS-E | DIN 371/374 | 2BX | 60° | C | Nitride

p.B205

Unit : mm

SIZE ØD1	TPI	EDP No. Ni	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#10	- 32UNF	TE454342	15	70	25	6	4.9	8	3	4.1
#12	- 28UNF	TE454382	16	80	30	6	4.9	8	4	4.7
5/16	- 24UNF	TE454462	17	90	35	8	6.2	9	4	6.9
7/16	- 20UNF	TE454542	22	100	40	8	6.2	9	4	9.9

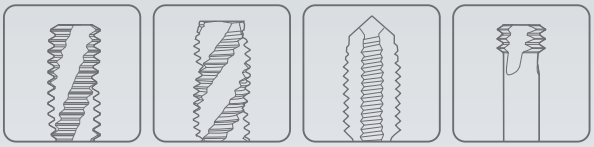
▶ DIN 371(#4~3/8) and DIN 374(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended															◎	◎	◎	◎	○	○

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended							○														

Global Cutting Tool Leader **YG-1**



THREADING

Leading Through Innovation

SOLID CARBIDE & HSS-E

YG TAP HARDENED

YG GEWINDEBOHRER FÜR GEHÄRTET

- **For Hardened Steels Applications to Control the Continuous and Red-glowing Chips**
- **Für gehärtete Stähle zur Kontrolle der kontinuierlichen und rotglühenden Späne**

SELECTION GUIDE

YG THREADING TOOLS

SOLID CARBIDE & HSS-E
YG TAP
HARDENED

For Hardened Steels Applications
to Control the Continuous and Red-glowing Chips

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B217

HOLE TYPE			Max. 2.0xD Blind / Through Hole	
TOOL MATERIAL			CARBIDE	
CHAMFER LEAD ACC. TO DIN2197			C	D
FLUTE TYPE			Straight Flute	Straight Flute
SPIRAL FLUTE ANGLE			-	-
	M	DIN371/376	T0997-TIC (p.B210)	T0999-TIC (p.B211)
		DIN352		
		DIN357/LONG		
	MF	DIN—374		
		DIN2181		
	UNC	DIN371/376		
		DIN351		
	UNF	DIN371/374		
		DIN2181		
	BSW	DIN2182/2183		
		DIN351		
	G(BSP)	DIN5156/5157		
	EG-M	DIN371/376		
	EG-UNC	DIN371/376		
	EG-UNF	DIN371/374		
SURFACE TREATMENT			TiCN	TiCN
MODEL				

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125			
	2		About 0.45% C	Annealed	190	13		
	3		About 0.45% C	Quenched & Tempered	250	25		
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10		
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55	◎	◎
	39			Hardened	630	60	◎	◎
	40	Chilled Cast Iron		Cast	400	42	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	◎	◎

YG TAP HARDENED

T0997-TIC SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

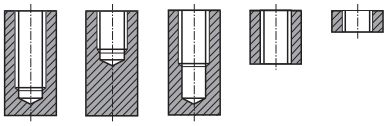
▶ Carbide tap can increase tool life longer than HSS taps due to higher hardness. Suitable for hardened steels (HRc50~60)

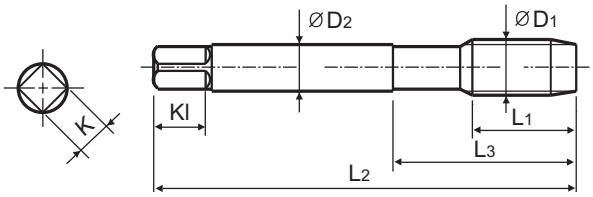
▶ VHM-Gewindebohrer ermöglichen aufgrund ihrer höheren Härte bessere Standzeiten als HSS-Gewindebohrer. Geeignet für gehärtete Stähle (HRc50~60)

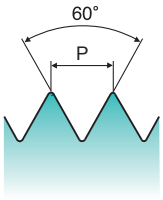
DIN 371

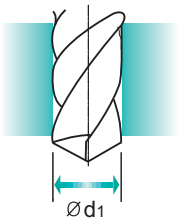
DIN 376

Hole type
2.0×D









Material groups **HR** | CARBIDE | DIN 371/376 | 6HX | 60° | C | TiCN

p.B217

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiCN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	**T0997206TIC**	11	56	18	3.5	2.7	6	4	2.55
M4	× 0.7	**T0997246TIC**	13	63	21	4.5	3.4	6	4	3.4
M5	× 0.8	**T0997286TIC**	15	70	25	6	4.9	8	4	4.3
M6	× 1.0	**T0997316TIC**	17	80	30	6	4.9	8	5	5.1
M8	× 1.25	**T0997366TIC**	20	90	35	8	6.2	9	5	6.9
M10	× 1.5	**T0997426TIC**	22	100	39	10	8	11	5	8.6
M12	× 1.75	**T0997506TIC**	24	110	–	9	7	12	5	10.4
M14	× 2.0	**T0997546TIC**	26	110	–	11	9	12	6	12.2
M16	× 2.0	**T0997606TIC**	27	110	–	12	9	12	6	14.2
M18	× 2.5	**T0997656TIC**	30	125	–	14	11	14	6	15.7
M20	× 2.5	**T0997706TIC**	32	140	–	16	12	15	6	17.7

▶ DIN 371(M3~M10) and DIN 376(M12~M20)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended									○											

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended																		◎	◎	◎	◎

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YG TAP HARDENED

TC313 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

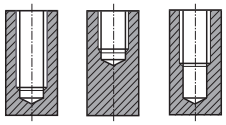
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

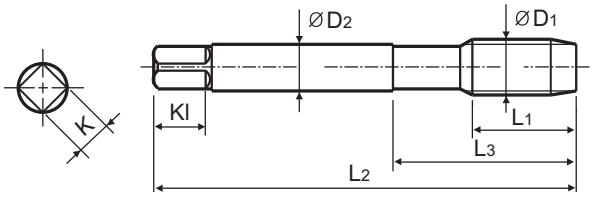
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

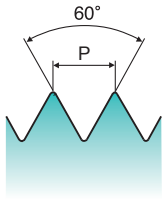
DIN 371

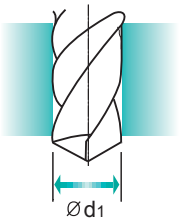
DIN 376

Hole type
2.5×D









Material groups **HR** | HSS-E | DIN 371/376 | 6H | 60° | C | R40 | Bright

p.B217

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2.5	× 0.45	TC313176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TC313206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TC313226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TC313246	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TC313286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TC313316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TC313346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TC313366	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TC313426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TC313506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TC313546	20	110	44	11	9	12	3	12
M16	× 2.0	TC313606	20	110	44	12	9	12	3	14
M18	× 2.5	TC313656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TC313706	25	140	54	16	12	15	4	17.5
M22	× 2.5	TC313746	25	140	54	18	14.5	17	4	19.5
M24	× 3.0	TC313786	30	160	60	18	14.5	17	4	21
M27	× 3.0	TC313866	30	160	60	20	16	19	4	24
M30	× 3.5	TC313946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended							○	○	◎					○						

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended						○															

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YG TAP HARDENED

TY313 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

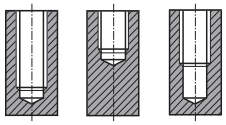
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

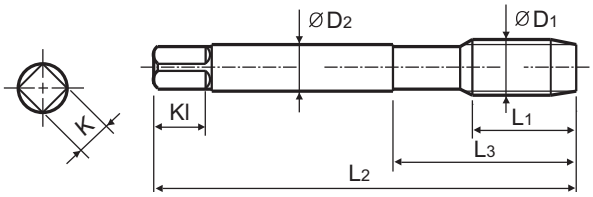
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

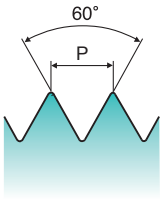
DIN 371

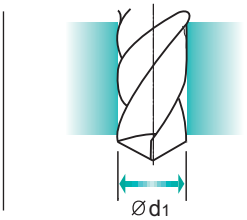
DIN 376

Hole type
2.5×D









Material groups **HR** | HSS-E | DIN 371/376 | 6H | 60° | C | R40 | TiAlN

p.B217

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiAlN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TY313136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TY313156	8	45	13	2.8	2.1	5	3	1.75
M2.5	× 0.45	TY313176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TY313496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TY313206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TY313226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TY313246	7	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TY313266	8	70	25	6	4.9	8	3	3.7
M5	× 0.8	TY313286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TY313316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TY313346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TY313366	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TY313426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TY313506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TY313546	20	110	44	11	9	12	3	12
M16	× 2.0	TY313606	20	110	44	12	9	12	3	14
M18	× 2.5	TY313656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TY313706	25	140	54	16	12	15	4	17.5
M24	× 3.0	TY313786	30	160	60	18	14.5	17	4	21
M30	× 3.5	TY313946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended							○	○	◎					○						

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended						○															

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YG TAP HARDENED

TY283 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

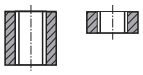
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

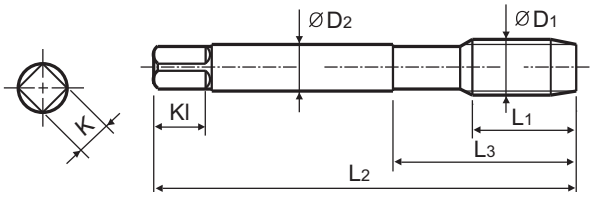
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

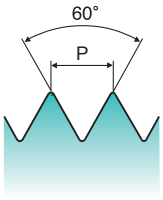
DIN 371

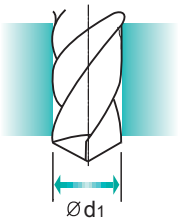
DIN 376

Hole type
3.0×D









Material groups **HR** | HSS-E | DIN 371/376 | 6H | 60° | B | TiAlN | p.B217

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiAlN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	**TY283136**	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	**TY283156**	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	**TY283196**	8	45	13	2.8	2.1	5	3	1.9
M2.5	× 0.45	**TY283176**	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	**TY283496**	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	**TY283206**	11	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	**TY283226**	12	56	20	4	3	6	3	2.9
M4	× 0.7	**TY283246**	13	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	**TY283266**	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	**TY283286**	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	**TY283316**	17	80	30	6	4.9	8	3	5
M7	× 1.0	**TY283346**	17	80	30	7	5.5	8	3	6
M8	× 1.25	**TY283366**	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	**TY283426**	22	100	39	10	8	11	3	8.5
M11	× 1.5	**TY283466**	22	100	40	8	6.2	9	3	9.5
M12	× 1.75	**TY283506**	24	110	44	9	7	10	3	10.2
M14	× 2.0	**TY283546**	26	110	44	11	9	12	3	12
M16	× 2.0	**TY283606**	27	110	44	12	9	12	3	14
M18	× 2.5	**TY283656**	30	125	50	14	11	14	4	15.5
M20	× 2.5	**TY283706**	32	140	54	16	12	15	4	17.5
M22	× 2.5	**TY283746**	32	140	54	18	14.5	17	4	19.5
M24	× 3.0	**TY283786**	34	160	60	18	14.5	17	4	21

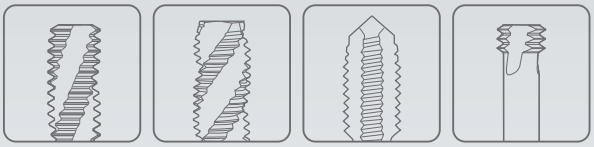
▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended							○	○	◎					○						

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended						○															

Global Cutting Tool Leader **YG-1**



THREADING

Leading Through Innovation

HSS-PM

YG TAP Ti Ni

YG Gewindebohrer Titan / Superlegierungen

- For Heat Resistent Super Alloys and Titanium Alloys Applied with Cutting Edge Rake Angles and Thread Relief
- Für hitzebeständige Superlegierungen und Titanlegierungen, mit Schneidkanten-Spanwinkeln und Gewindehinterschliff

SELECTION GUIDE

YG THREADING TOOLS

HSS-PM
YG TAP
Ti Ni

For Heat Resistent Super Alloys and Titanium Alloys
Applied with Cutting Edge Rake Angles and Thread Relief

HOLE TYPE			Max. 2.5xD Blind Hole		Max. 3.0xD Through Hole	
TOOL MATERIAL			HSS-PM			
CHAMFER LEAD ACC. TO DIN2197			C	C	B	B
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Point	Spiral Point
SPIRAL FLUTE ANGLE			R25	R25	-	-
SERIES	M	DIN371/376	TM903 (p.B222)	TZ903 (p.B223)	TM293 (p.B224)	TZ293 (p.B225)
		DIN352				
		DIN357/LONG				
	MF	DIN374				
		DIN2181				
	UNC	DIN371/376				
		DIN351				
	UNF	DIN371/374				
		DIN2181				
	BSW	DIN2182/2183				
		DIN351				
	G(BSP)	DIN5156/5157				
	EG-M	DIN371/376				
	EG-UNC	DIN371/376				
	EG-UNF	DIN371/374				
SURFACE TREATMENT			Bright	TiAlN	Bright	TiAlN
MODEL						

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B234

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125					
	2		About 0.45% C	Annealed	190	13				
	3		About 0.45% C	Quenched & Tempered	250	25				
	4		About 0.75% C	Annealed	270	28				
	5		About 0.75% C	Quenched & Tempered	300	32				
	6	Low alloy steel		Annealed	180	10				
	7			Quenched & Tempered	275	29	○	○	○	○
	8			Quenched & Tempered	300	32	○	○	○	○
	9			Quenched & Tempered	350	38	○	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15				
	11			Quenched & Tempered	325	35				
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○
	32			Cured	280	30			○	○
	33		Ni or Co Based	Annealed	250	25			○	○
	34			Cured	350	38			○	○
	35			Cast	320	34			○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		◎	◎	◎	◎
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42			○	○
	41	Hardened Cast Iron		Hardened	550	55				

YG TAP Ti Ni

TM903 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

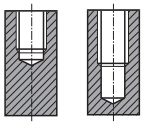
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

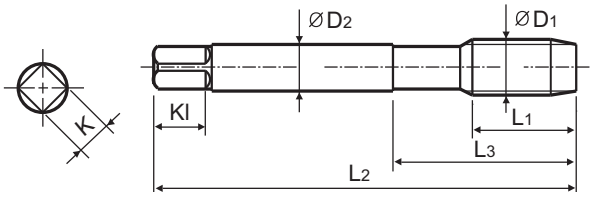
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

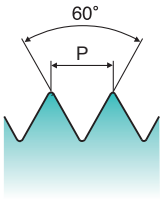
DIN 371

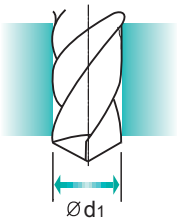
DIN 376

Hole type
2.5×D









Material groups **Ti** | HSS PM | DIN 371/376 | 6H | 60° | C | R25 | Bright

p.B234

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TM903136	8	45	13	2.8	2.1	5	3	1.6
M2.5	× 0.45	TM903176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TM903496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TM903206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TM903226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TM903246	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TM903286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TM903316	10	80	30	6	4.9	8	3	5
M8	× 1.25	TM903366	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TM903426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TM903506	18	110	44	9	7	10	3	10.2
M16	× 2.0	TM903606	20	110	44	12	9	12	3	14

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended							○	○	○											

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											○					○	◎				

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YG-1 CO., LTD.

YG TAP Ti Ni

TM293 SERIES

M-Az ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

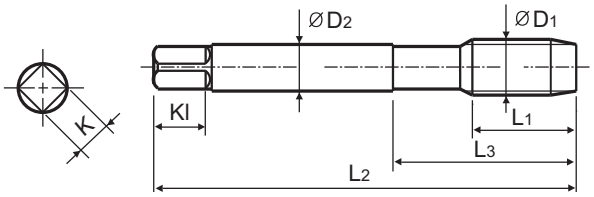
▶ Interrupted tap to reduce contact area and tapping torque, and to give more chip space.

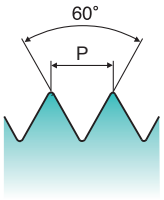
▶ Gewindebohrer mit ausgesetzten Zahnen um die Kontaktzone mit dem Werkstuck und das Drehmoment zu minimieren und dem Span mehr Raum zu geben.

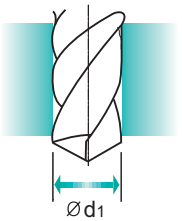
DIN 371

DIN 376

Hole type
3.0×D







Material groups **Ti** | HSS PM | DIN 371/376 | 6H | 60° | B | Bright

p.B234

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TM293136	8	45	13	2.8	2.1	5	3	1.6
*M2.6	× 0.45	TM293496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TM293206	11	56	18	3.5	2.7	6	3	2.5
M4.5	× 0.75	TM293266	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	TM293286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TM293316	17	80	30	6	4.9	8	3	5
M7	× 1.0	TM293346	17	80	30	7	5.5	8	3	6
M8	× 1.25	TM293366	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	TM293426	22	100	39	10	8	11	3	8.5
M12	× 1.75	TM293506	24	110	44	9	7	10	3	10.2
M14	× 2.0	TM293546	26	110	44	11	9	12	3	12
M16	× 2.0	TM293606	27	110	44	12	9	12	3	14
M18	× 2.5	TM293656	30	125	50	14	11	14	4	15.5
M20	× 2.5	TM293706	32	140	54	16	12	15	4	17.5
M24	× 3.0	TM293786	34	160	60	18	14.5	17	4	21
M27	× 3.0	TM293866	36	160	60	20	16	19	4	24

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended							○	○	○											

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											○	○	○	○	○	○	◎			○	

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YG TAP Ti Ni

TM933 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

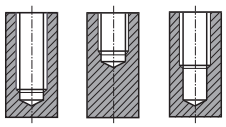
▶ For tapping Nickel alloys and heat resistant alloy steels which are used in aerospace and checmical industries.

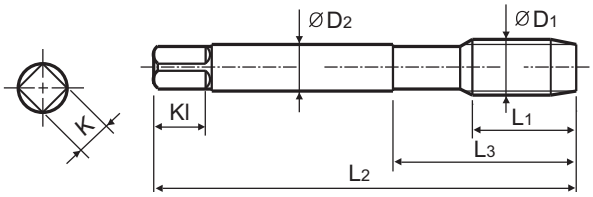
▶ Zum Gewindeschneiden von Nickellegierungen und hitzefesten Legierungsstähl, die in der Luftfahrtindustrie und chemischen Industrie verwendet werden.

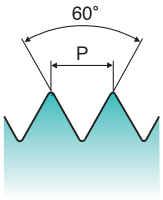
DIN 371

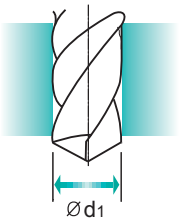
DIN 376

Hole type
2.5×D









Material groups **Ni** | HSS PM | DIN 371/376 | 6H | 60° | C | R40 | Bright

p.B234

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TM933136	8	45	13	2.8	2.1	5	3	1.6
M2.5	× 0.45	TM933176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TM933206	6	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	TM933246	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TM933286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TM933316	10	80	30	6	4.9	8	3	5
M8	× 1.25	TM933366	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TM933426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TM933506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TM933546	20	110	44	11	9	12	3	12
M16	× 2.0	TM933606	20	110	44	12	9	12	3	14
M20	× 2.5	TM933706	25	140	54	16	12	15	4	17.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎		○				

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YG-1 CO., LTD.

YG TAP Ti Ni

TM923 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

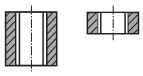
▶ For tapping Nickel alloys and heat resistant alloy steels which are used in aero space and checmical industries.

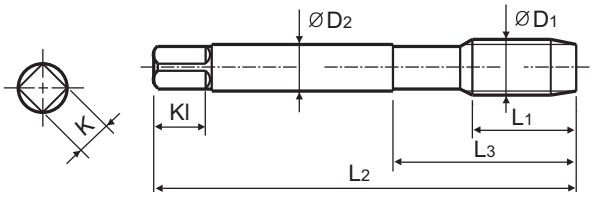
▶ Zum Gewindeschneiden von Nickellegierungen und hitzefesten Legierungsstählen, die in der Luftfahrtindustrie und chemischen Industrie verwendet werden.

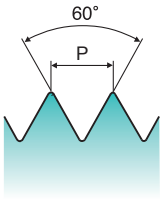
DIN 371

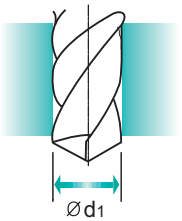
DIN 376

Hole type
3.0×D









Material groups **Ni** | HSS PM | DIN 371/376 | 6H | 60° | B | Bright

p.B234

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2.5	× 0.45	TM923176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TM923206	11	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	TM923246	13	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TM923286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TM923316	17	80	30	6	4.9	8	3	5
M8	× 1.25	TM923366	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	TM923426	22	100	39	10	8	11	3	8.5
M12	× 1.75	TM923506	24	110	44	9	7	10	3	10.2
M14	× 2.0	TM923546	26	110	44	11	9	12	3	12
M16	× 2.0	TM923606	27	110	44	12	9	12	3	14
M18	× 2.5	TM923656	30	125	50	14	11	14	4	15.5
M20	× 2.5	TM923706	32	140	54	16	12	15	4	17.5
M22	× 2.5	TM923746	32	140	54	18	14.5	17	4	19.5
M24	× 3.0	TM923786	34	160	60	18	14.5	17	4	21
M27	× 3.0	TM923866	36	160	60	20	16	19	4	24
M30	× 3.5	TM923946	40	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎		○			○	

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YG-1 CO., LTD.

YG TAP Ti Ni

TQ833 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

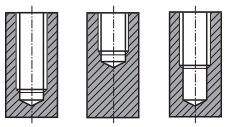
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

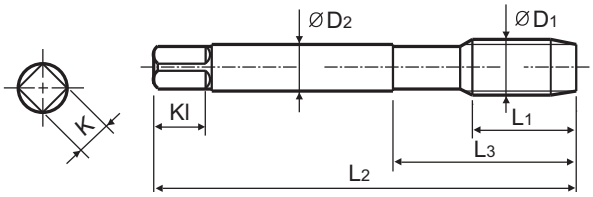
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

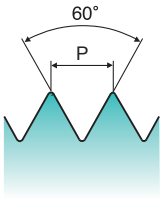
DIN 371

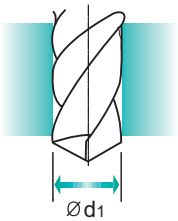
DIN 376

Hole type
2.5×D









Material groups: Ti Ni | HSS PM | DIN 371/376 | 6H | 60° | C | R40 | Vap

p.B234

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TQ833136	8	45	13	2.8	2.1	5	3	1.6
M2.5	× 0.45	TQ833176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TQ833206	6	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	TQ833246	7	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TQ833266	8	70	25	6	4.9	8	3	3.7
M5	× 0.8	TQ833286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TQ833316	10	80	30	6	4.9	8	3	5
M8	× 1.25	TQ833366	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TQ833426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TQ833506	18	110	44	9	7	10	3	10.2

▶ DIN 371(M2~M10) and DIN 376(M12)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎	○	◎				

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YG TAP Ti Ni

TQ873 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

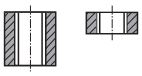
▶ Suitable for through hole in more cutting speed than other taps due to thick web and the best substrate.

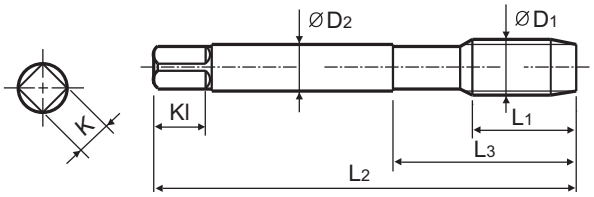
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke und bestem Werkstoff.

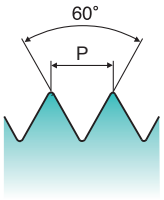
DIN 371

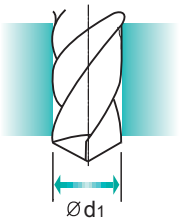
DIN 376

Hole type
3.0×D









Material groups **Ti Ni** | HSS PM | DIN 371/376 | 6H | 60° | B | Vap

p.B234

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TQ873136	8	45	13	2.8	2.1	5	3	1.6
M2.5	× 0.45	TQ873176	9	50	15	2.8	2.1	5	3	2.05
M4	× 0.7	TQ873246	13	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TQ873286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TQ873316	17	80	30	6	4.9	8	3	5
M8	× 1.25	TQ873366	20	90	35	8	6.2	9	3	6.8
M12	× 1.75	TQ873506	24	110	44	9	7	10	3	10.2

▶ DIN 371(M2~M10) and DIN 376(M12)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended						◎	◎	◎	◎											

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎	○	◎			○	

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YG TAP Ti Ni

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

					TM903	TZ903	TM293	TZ293	TM933	TZ933	TM923	TZ923	TQ833	TR833	TQ873	TR873
ISO	VDI 3323	Material Description	HB	HRc	Vc (m/min.)											
P	6	Low alloy steel	180	10					10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
	7		275	29	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
	8		300	32	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10
	9		350	38	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5
S	31	Heat Resistant Super Alloys	200	15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
	32		280	30			10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
	33		250	25			2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4
	34		350	38			2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4
	35		320	34			2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4
	36	Titanium Alloys	400 Rm		10-15	10-15	10-15	10-15					10-15	10-15	10-15	10-15
	37		1050 Rm		4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6
H	38	Hardened steel	550	55								3-5				
	40	Chilled Cast Iron	400	42			3-5	3-5			3-5	3-5			3-5	3-5

Leading Through Innovation

HSS-E

YG TAP ALU

YG TAP Aluminium

- For long-chipping Aluminum Wrought Alloys with Large Chip Gullets to Avoid Clogging in the Threading Operations
- Für langspanende Aluminium-Knetlegierungen mit großen Spanabständen zur Vermeidung von Verstopfungen beim Gewindeschneiden.

SELECTION GUIDE

YG THREADING TOOLS

HSS-E
YG TAP
ALU

For long-chipping Aluminum Wrought Alloys with Large Chip Gullets to Avoid Clogging in the Threading Operations

HOLE TYPE			Max. 2.5xD Blind Hole	
TOOL MATERIAL			HSS-E	
CHAMFER LEAD ACC. TO DIN2197			C	C
FLUTE TYPE			Spiral Flute	Spiral Flute
SPIRAL FLUTE ANGLE			R45	R40
SERIES	M	DIN371/376	TC163 (p.B238)	TE953 (p.B239)
		DIN352		
		DIN357/LONG		
	MF	DIN374	TC963 (p.B240)	
		DIN2181		
	UNC	DIN371/376	TC169 (p.B241)	
		DIN351		
	UNF	DIN371/374	TC170 (p.B242)	
		DIN2181		
	BSW	DIN2182/2183		
		DIN351		
	G(BSP)	DIN5156/5157		
	EG-M	DIN371/376		
	EG-UNC	DIN371/376		
	EG-UNF	DIN371/374		
SURFACE TREATMENT			Bright	Nitride
MODEL				

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B248

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	
	2		About 0.45% C	Annealed	190	13	○	
	3		About 0.45% C	Quenched & Tempered	250	25	○	○
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10		
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60		◎	○
	22		Curable	Hardened	100		◎	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	○
	24		≤ 12% Si, Curable	Hardened	90		◎	○
	25		> 12% Si, Not Curable		130			◎
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90		○	
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

YG TAP ALU

TC163 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

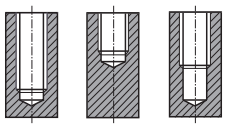
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

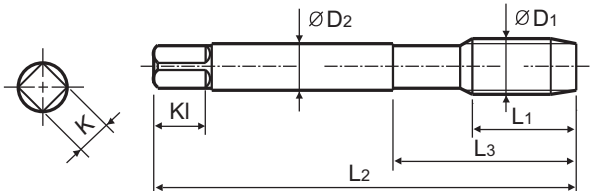
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

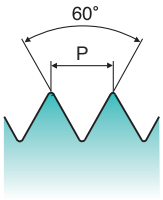
DIN 371

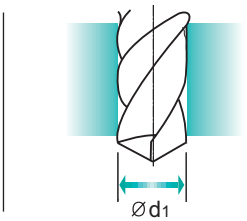
DIN 374

Hole type
2.5×D









Material groups **AI** | HSS-E | DIN 371/376 | 6H | 60° | C | R45 | Bright

p.B248

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TC163136	8	45	13	2.8	2.1	5	2	1.6
M2.2	× 0.45	TC163156	8	45	13	2.8	2.1	5	2	1.75
*M2.3	× 0.4	TC163196	8	45	13	2.8	2.1	5	2	1.9
M2.5	× 0.45	TC163176	9	50	15	2.8	2.1	5	2	2.05
M3	× 0.5	TC163206	6	56	18	3.5	2.7	6	2	2.5
M3.5	× 0.6	TC163226	7	56	20	4	3	6	2	2.9
M4	× 0.7	TC163246	7	63	21	4.5	3.4	6	2	3.3
M4.5	× 0.75	TC163266	8	70	25	6	4.9	8	2	3.7
M5	× 0.8	TC163286	8	70	25	6	4.9	8	2	4.2
M6	× 1.0	TC163316	10	80	30	6	4.9	8	2	5
M7	× 1.0	TC163346	10	80	30	7	5.5	8	2	6
M8	× 1.25	TC163366	13	90	35	8	6.2	9	2	6.8
M9	× 1.25	TC163396	13	90	35	9	7	10	2	7.8
M10	× 1.5	TC163426	15	100	39	10	8	11	2	8.5
M11	× 1.5	TC163466	17	100	40	8	6.2	9	2	9.5
M12	× 1.75	TC163506	18	110	44	9	7	10	2	10.2
M14	× 2.0	TC163546	20	110	44	11	9	12	3	12
M16	× 2.0	TC163606	20	110	44	12	9	12	3	14
M20	× 2.5	TC163706	25	140	54	16	12	15	3	17.5
M22	× 2.5	TC163746	25	140	54	18	14.5	17	3	19.5
M24	× 3.0	TC163786	30	160	60	18	14.5	17	3	21
M27	× 3.0	TC163866	30	160	60	20	16	19	3	24
M30	× 3.5	TC163946	35	180	70	22	18	21	3	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○																	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	◎	◎			○														

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YG-1 CO., LTD.

YG TAP ALU

TC963 SERIES

MF ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

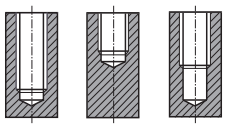
Machine taps
Maschinengewindebohrer

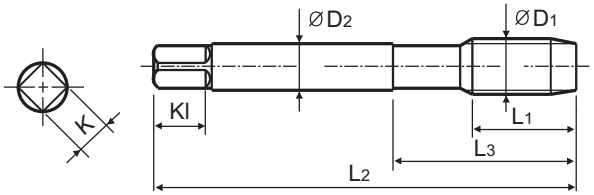
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

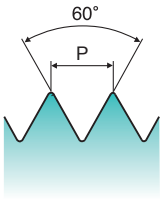
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

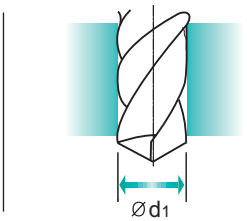
DIN 374

Hole type
2.5×D









Material groups **Al** | HSS-E | DIN 374 | 6H | 60° | C | R45 | Bright

p.B248

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M4	× 0.5	TC963256	5	63	21	2.8	2.1	5	2	3.5
M5	× 0.5	TC963296	5	70	25	3.5	2.7	6	2	4.5
M6	× 0.75	TC963326	8	80	30	4.5	3.4	6	2	5.2
M6	× 0.5	TC963336	5	80	30	4.5	3.4	6	2	5.5
M7	× 0.75	TC963356	10	80	30	5.5	4.3	7	2	6.2
M8	× 1.0	TC963376	10	90	36	6	4.9	8	2	7
M8	× 0.75	TC963386	8	80	30	6	4.9	8	2	7.2
M10	× 1.25	TC963436	16	100	40	7	5.5	8	2	8.8
M10	× 1.0	TC963446	10	90	36	7	5.5	8	2	9
M12	× 1.5	TC963516	15	100	40	9	7	10	2	10.5
M12	× 1.25	TC963526	15	100	40	9	7	10	2	10.8
M14	× 1.5	TC963556	15	100	40	11	9	12	3	12.5
M14	× 1.25	TC963566	15	100	40	11	9	12	3	12.8
M16	× 1.5	TC963616	15	100	40	12	9	12	3	14.5
M18	× 1.5	TC963676	17	110	44	14	11	14	3	16.5
M20	× 1.5	TC963726	17	125	50	16	12	15	3	18.5
M22	× 1.5	TC963766	17	125	50	18	14.5	17	3	20.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○																	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎			○														

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG TAP ALU

TC170 SERIES

UNF

Unified fine threads

- Unified Feingewinde
- UNF
- Unificato passo fine

Machine taps
Maschinengewindebohrer

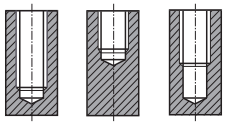
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

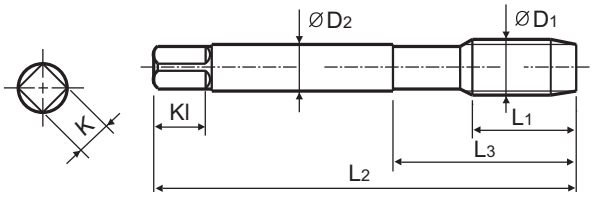
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

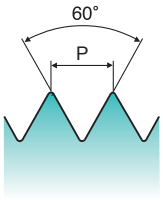
DIN 371

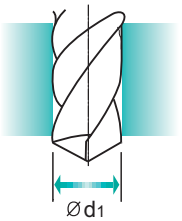
DIN 374

Hole type
2.5×D









Material groups **AI** | HSS-E | DIN 371/374 | 2B | 60° | C | R45 | Bright

p.B248

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#5	44UNF	TC170222	7	56	18	3.5	2.7	6	2	2.7
#8	36UNF	TC170302	8	63	21	4.5	3.4	6	2	3.5
#10	32UNF	TC170342	10	70	25	6	4.9	8	2	4.1
#12	28UNF	TC170382	10	80	30	6	4.9	8	2	4.7
1/4	28UNF	TC170422	10	80	30	7	5.5	8	2	5.5
5/16	24UNF	TC170462	10	90	35	8	6.2	9	2	6.9
7/16	20UNF	TC170542	13	100	40	8	6.2	9	2	9.9
9/16	18UNF	TC170622	15	100	40	11	9	12	3	12.9
5/8	18UNF	TC170662	15	100	40	12	9	12	3	14.5
3/4	16UNF	TC170722	17	110	44	14	11	14	3	17.5

▶ DIN 371(#4~3/8) and DIN 374(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○																	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	◎	◎			○														

YG TAP ALU

TE943 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

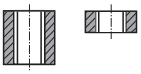
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

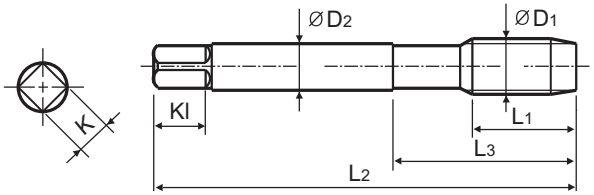
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

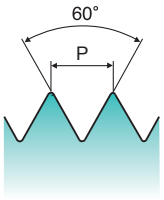
DIN 371

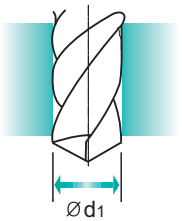
DIN 376

Hole type
3.0×D









Material groups **AI** | HSS-E | DIN 371/376 | 6H | 60° | B | Nitride

p.B248

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Ni	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	**TE943136**	8	45	13	2.8	2.1	5	3	1.6
M5	× 0.8	**TE943286**	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	**TE943316**	17	80	30	6	4.9	8	3	5
M8	× 1.25	**TE943366**	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	**TE943426**	22	100	39	10	8	11	3	8.5
M12	× 1.75	**TE943506**	24	110	44	9	7	10	3	10.2
M14	× 2.0	**TE943546**	26	110	44	11	9	12	3	12
M16	× 2.0	**TE943606**	27	110	44	12	9	12	3	14
M20	× 2.5	**TE943706**	32	140	54	16	12	15	4	17.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended			○																	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	◎																

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YG TAP ALU

TE443 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

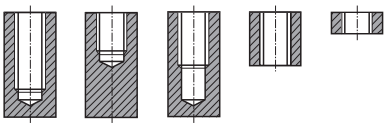
▶ Suitable for brass and short chip work materials.

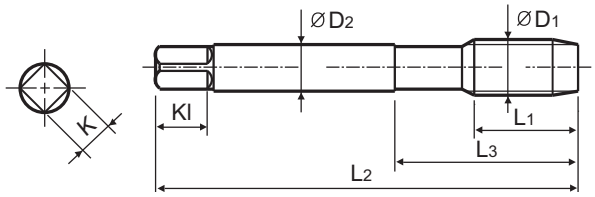
▶ Geeignet zum Gewindeschneiden von Messing und anderen kurzspanenden Werkstoffen

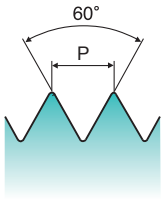
DIN 371

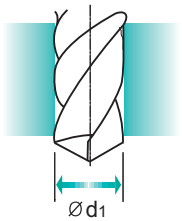
DIN 376

Hole type
2.0×D









Material groups **Ms** | HSS-E | DIN 371/376 | 6HX | 60° | C | Nitride

p.B248

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Ni	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TE443136	8	45	13	2.8	2.1	5	3	1.6
M2.5	× 0.45	TE443176	9	50	15	2.8	2.1	5	3	2.05
M4	× 0.7	TE443246	13	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TE443286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TE443316	17	80	30	6	4.9	8	3	5
M8	× 1.25	TE443366	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	TE443426	22	100	39	10	8	11	3	8.5
M12	× 1.75	TE443506	24	110	44	9	7	10	3	10.2
M14	× 2.0	TE443546	26	110	44	11	9	12	3	12
M16	× 2.0	TE443606	27	110	44	12	9	12	3	14

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						◎	○														

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YG-1 CO., LTD.

YG TAP ALU

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

ISO	VDI 3323	Material Description	HB	HRc	TC163 TC963 TC169 TC170	TE953	TC622	TE943	TC433	TE443	TY433
					Vc (m/min.)						
P	1	Non-alloy steel	125		15-20		15-20				
	2		190	13	15-20		15-20				
	3		250	25	12-18	12-18	12-18	12-18			
N	21	Aluminum-wrought alloy	60		10-15	10-15	10-15	10-15			
	22		100		10-15	10-15	10-15	10-15			
	23	Aluminum-cast, alloyed	75		15-20	15-20	15-20	15-20			
	24		90		15-20	15-20	15-20	15-20			
	25		130			10-15		10-15			
	26	Copper and Copper Alloys (Bronze / Brass)	110						25-35	25-35	35-40
	27		90		8-12		8-12		8-12	8-12	12-16
	28		100						15-20		20-25

Leading Through Innovation

HSS-E & HSS-PM

YG TAP FORMING
YG INNENGEWINDEFORMER

- **Tapping by Forming Soft Materials**
- **Gewindeherstellung duch Formen von weichen Materialien**

SELECTION GUIDE

YG THREADING TOOLS

HSS-E & HSS-PM
YG TAP FORMING

Tapping by Forming Soft Materials

HOLE TYPE			Max. 3.0xD Blind / Through Hole	
TOOL MATERIAL			HSS-E	
CHAMFER LEAD ACC. TO DIN2197			C	C
FLUTE TYPE			-	-
SPIRAL FLUTE ANGLE			-	-
SERIES	M	DIN371/376	TD703 (p.B252)	TE703 (p.B253)
		DIN352		
		DIN357/LONG		
	MF	DIN374	TD733 (p.B261)	TE733 (p.B262)
		DIN2181		
	UNC	DIN371/376	TD704 (p.B263)	TE704 (p.B264)
		DIN351		
	UNF	DIN371/374		
		DIN2181		
	BSW	DIN2182/2183		
		DIN351		
	G(BSP)	DIN5156/5157		
	EG-M	DIN371/376		
	EG-UNC	DIN371/376		
	EG-UNF	DIN371/374		
SURFACE TREATMENT /COATING			TiN	Nitride
MODEL				

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B265

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10	◎	◎
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○
	14		Austenitic		180	10	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎
	22		Curable	Hardened	100		◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100		○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

YG TAP FORMING

TD703 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Cold forming taps with oil grooves
Gewindeformer mit Schmiernuten

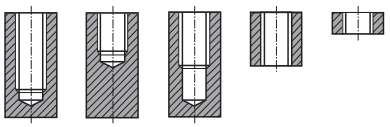
- Suitable for threading soft materials with at least 8-10% elongation.
- The pre-drilling holes are bigger than normal sized holes.

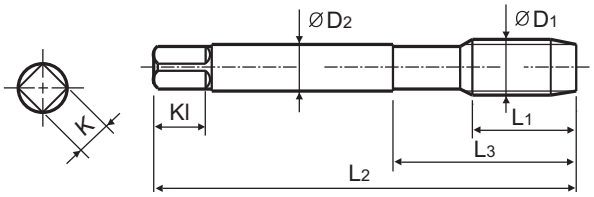
- Geeignet zum Gewindeformen weicher Werkstoffe mit mindestens 8-10% Dehnung.
- Die Kernlochbohrungen sind größer als normale Kernlöcher.

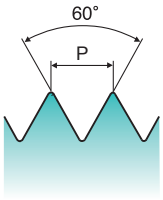
DIN 371

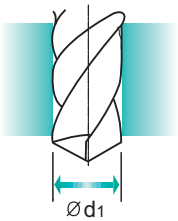
DIN 376

Hole type
3.0×D









Material groups **GV** | HSS-E | DIN 371/376 | 6HX | 60° | C | TiN

p.B265

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Ød1
M2	× 0.4	**TD703136**	8	45	13	2.8	2.1	5	1.83
M2.2	× 0.45	**TD703156**	8	45	13	2.8	2.1	5	2
*M2.3	× 0.4	**TD703196**	8	45	13	2.8	2.1	5	2.1
M2.5	× 0.45	**TD703176**	9	50	15	2.8	2.1	5	2.3
*M2.6	× 0.45	**TD703496**	9	50	15	2.8	2.1	5	2.4
M3	× 0.5	**TD703206**	11	56	18	3.5	2.7	6	2.8
M3.5	× 0.6	**TD703226**	12	56	20	4	3	6	3.25
M4	× 0.7	**TD703246**	13	63	21	4.5	3.4	6	3.7
M4.5	× 0.75	**TD703266**	14	70	25	6	4.9	8	4.15
M5	× 0.8	**TD703286**	15	70	25	6	4.9	8	4.65
M6	× 1.0	**TD703316**	17	80	30	6	4.9	8	5.55
M7	× 1.0	**TD703346**	17	80	30	7	5.5	8	6.55
M8	× 1.25	**TD703366**	20	90	35	8	6.2	9	7.4
M9	× 1.25	**TD703396**	20	90	35	9	7	10	8.4
M10	× 1.5	**TD703426**	22	100	39	10	8	11	9.3
M11	× 1.5	**TD703466**	22	100	40	8	6.2	9	10.3
M12	× 1.75	**TD703506**	24	110	44	9	7	10	11.2
M14	× 2.0	**TD703546**	26	110	44	11	9	12	13
M16	× 2.0	**TD703606**	27	110	44	12	9	12	15
M20	× 2.5	**TD703706**	32	140	54	16	12	15	18.8

- DIN 371(M2~M10) and DIN 376(M11~M20)
- * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎						○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	○	○		○		○													

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YG TAP FORMING

TY703 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Cold forming taps with oil grooves
Gewindeformer mit Schmiernuten

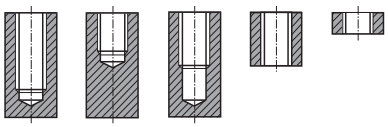
- Suitable for threading soft materials with at least 8-10% elongation.
- The pre-drilling holes are bigger than normal sized holes.

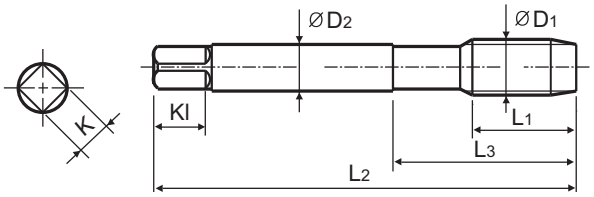
- Geeignet zum Gewindeformen weicher Werkstoffe mit mindestens 8-10% Dehnung.
- Die Kernlochbohrungen sind größer als normale Kernlöcher.

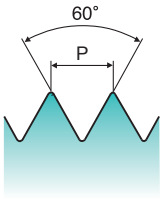
DIN 371

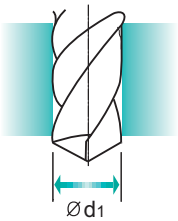
DIN 376

Hole type
3.0×D









Material groups **GV** | HSS-E | DIN 371/376 | 6HX | 60° | C | TiAlN | p.B265

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	P	TiAlN	L1	L2	L3	ØD2	K	Kl	Ød1
M2	× 0.4	**TY703136**	8	45	13	2.8	2.1	5	1.83
M2.2	× 0.45	**TY703156**	8	45	13	2.8	2.1	5	2
*M2.3	× 0.4	**TY703196**	8	45	13	2.8	2.1	5	2.1
M2.5	× 0.45	**TY703176**	9	50	15	2.8	2.1	5	2.3
*M2.6	× 0.45	**TY703496**	9	50	15	2.8	2.1	5	2.4
M3	× 0.5	**TY703206**	11	56	18	3.5	2.7	6	2.8
M3.5	× 0.6	**TY703226**	12	56	20	4	3	6	3.25
M4	× 0.7	**TY703246**	13	63	21	4.5	3.4	6	3.7
M4.5	× 0.75	**TY703266**	14	70	25	6	4.9	8	4.15
M5	× 0.8	**TY703286**	15	70	25	6	4.9	8	4.65
M6	× 1.0	**TY703316**	17	80	30	6	4.9	8	5.55
M7	× 1.0	**TY703346**	17	80	30	7	5.5	8	6.55
M8	× 1.25	**TY703366**	20	90	35	8	6.2	9	7.4
M9	× 1.25	**TY703396**	20	90	35	9	7	10	8.4
M10	× 1.5	**TY703426**	22	100	39	10	8	11	9.3
M11	× 1.5	**TY703466**	22	100	40	8	6.2	9	10.3
M12	× 1.75	**TY703506**	24	110	44	9	7	10	11.2
M14	× 2.0	**TY703546**	26	110	44	11	9	12	13
M16	× 2.0	**TY703606**	27	110	44	12	9	12	15
M18	× 2.5	**TY703656**	30	125	50	14	11	14	16.8
M20	× 2.5	**TY703706**	32	140	54	16	12	15	18.8

- DIN 371(M2~M10) and DIN 376(M11~M20)
- * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎						○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	○	○		○		◎													

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YG-1 CO., LTD.

YG TAP FORMING

TD713 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Cold forming taps with oil grooves
Gewindeformer mit Schmiernuten

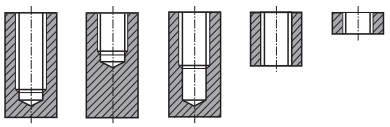
- Suitable for threading soft materials with at least 8-10% elongation.
- The pre-drilling holes are bigger than normal sized holes.

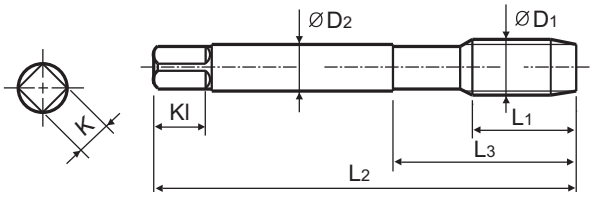
- Geeignet zum Gewindeformen weicher Werkstoffe mit mindestens 8-10% Dehnung.
- Die Kernlochbohrungen sind größer als normale Kernlöcher.

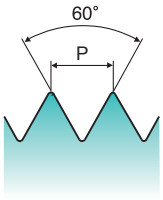
DIN 371

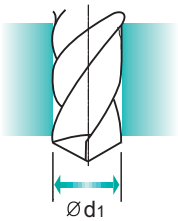
DIN 376

Hole type
3.0×D









Material groups **GV** | HSS-E | DIN 371/376 | 6GX | 60° | C | TiN

p.B265

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Ød1
M2	× 0.4	TD713136	8	45	13	2.8	2.1	5	1.83
M2.2	× 0.45	TD713156	8	45	13	2.8	2.1	5	2
*M2.3	× 0.4	TD713196	8	45	13	2.8	2.1	5	2.1
M2.5	× 0.45	TD713176	9	50	15	2.8	2.1	5	2.3
*M2.6	× 0.45	TD713496	9	50	15	2.8	2.1	5	2.4
M3	× 0.5	TD713206	11	56	18	3.5	2.7	6	2.8
M4	× 0.7	TD713246	13	63	21	4.5	3.4	6	3.7
M4.5	× 0.75	TD713266	14	70	25	6	4.9	8	4.15
M5	× 0.8	TD713286	15	70	25	6	4.9	8	4.65
M6	× 1.0	TD713316	17	80	30	6	4.9	8	5.55
M7	× 1.0	TD713346	17	80	30	7	5.5	8	6.55
M8	× 1.25	TD713366	20	90	35	8	6.2	9	7.4
M10	× 1.5	TD713426	22	100	39	10	8	11	9.3
M11	× 1.5	TD713466	22	100	40	8	6.2	9	10.3
M12	× 1.75	TD713506	24	110	44	9	7	10	11.2
M14	× 2.0	TD713546	26	110	44	11	9	12	13
M16	× 2.0	TD713606	27	110	44	12	9	12	15
M18	× 2.5	TD713656	30	125	50	14	11	14	16.8
M20	× 2.5	TD713706	32	140	54	16	12	15	18.8

- DIN 371(M2~M10) and DIN 376(M11~M20)
- * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎						○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	○	○		○		◎													

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YG-1 CO., LTD.

YG TAP FORMING

TQ723 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Cold forming taps
Gewindeformer

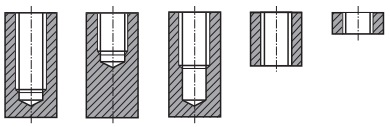
- Suitable for threading soft materials with at least 8-10% elongation in the best substrate.
- The pre-drilling holes are bigger than normal sized holes.

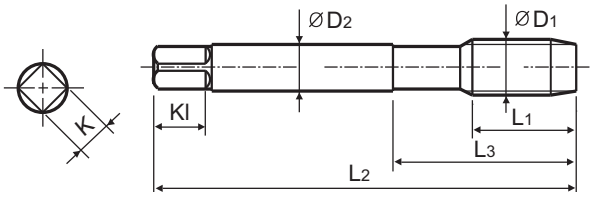
- Aus bestem Werkstoff geeignet zum Gewindeformen weicher Werkstoffe mit mindestens 8-10% Dehnung.
- Die Kernlochbohrungen sind größer als normale Kernlöcher.

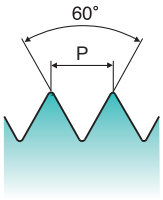
DIN 371

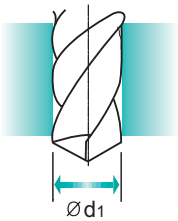
DIN 376

Hole type
3.0×D









Material groups **GV** | HSS PM | DIN 371/376 | 6HX | 60° | C | Vap

p.B265

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	P	Vap	L1	L2	L3	ØD2	K	Kl	Ød1
M2	× 0.4	TQ723136	8	45	13	2.8	2.1	5	1.83
M2.5	× 0.45	TQ723176	9	50	15	2.8	2.1	5	2.3
M3	× 0.5	TQ723206	11	56	18	3.5	2.7	6	2.8
M4	× 0.7	TQ723246	13	63	21	4.5	3.4	6	3.7
M5	× 0.8	TQ723286	15	70	25	6	4.9	8	4.65
M6	× 1.0	TQ723316	17	80	30	6	4.9	8	5.55
M8	× 1.25	TQ723366	20	90	35	8	6.2	9	7.4
M10	× 1.5	TQ723426	22	100	39	10	8	11	9.3
M11	× 1.5	TQ723466	22	100	40	8	6.2	9	10.3
M12	× 1.75	TQ723506	24	110	44	9	7	10	11.2
M16	× 2.0	TQ723606	27	110	44	12	9	12	15

- DIN 371(M2~M10) and DIN 376(M11~M20)
- * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎						○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	○	○		○		○													

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YG-1 CO., LTD.

YG TAP FORMING

TD723 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Cold forming taps
Gewindeformer

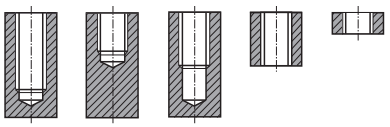
- Suitable for threading soft materials with at least 8-10% elongation.
- The pre-drilling holes are bigger than normal sized holes.

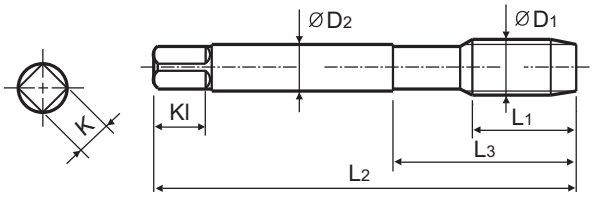
- Geeignet zum Gewindeformen weicher Werkstoffe mit mindestens 8-10% Dehnung.
- Die Kernlochbohrungen sind größer als normale Kernlöcher.

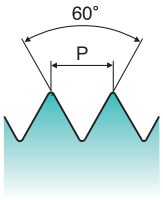
DIN 371

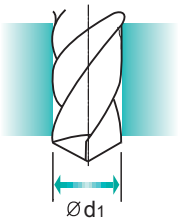
DIN 376

Hole type
3.0×D









Material groups **GV** | HSS-E | DIN 371/376 | 6HX | 60° | C | TiN

p.B265

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Ød1
M2	× 0.4	TD723136	8	45	13	2.8	2.1	5	1.83
M2.2	× 0.45	TD723156	8	45	13	2.8	2.1	5	2
*M2.3	× 0.4	TD723196	8	45	13	2.8	2.1	5	2.1
M2.5	× 0.45	TD723176	9	50	15	2.8	2.1	5	2.3
*M2.6	× 0.45	TD723496	9	50	15	2.8	2.1	5	2.4
M3	× 0.5	TD723206	11	56	18	3.5	2.7	6	2.8
M3.5	× 0.6	TD723226	12	56	20	4	3	6	3.25
M4	× 0.7	TD723246	13	63	21	4.5	3.4	6	3.7
M4.5	× 0.75	TD723266	14	70	25	6	4.9	8	4.15
M5	× 0.8	TD723286	15	70	25	6	4.9	8	4.65
M6	× 1.0	TD723316	17	80	30	6	4.9	8	5.55
M7	× 1.0	TD723346	17	80	30	7	5.5	8	6.55
M8	× 1.25	TD723366	20	90	35	8	6.2	9	7.4
M9	× 1.25	TD723396	20	90	35	9	7	10	8.4
M10	× 1.5	TD723426	22	100	39	10	8	11	9.3
M11	× 1.5	TD723466	22	100	40	8	6.2	9	10.3
M12	× 1.75	TD723506	24	110	44	9	7	10	11.2
M14	× 2.0	TD723546	26	110	44	11	9	12	13
M16	× 2.0	TD723606	27	110	44	12	9	12	15
M18	× 2.5	TD723656	30	125	50	14	11	14	16.8
M20	× 2.5	TD723706	32	140	54	16	12	15	18.8

- DIN 371(M2~M10) and DIN 376(M11~M20)
- * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎						○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	○	○		○		◎													

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YG TAP FORMING

TE733 SERIES

MF ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

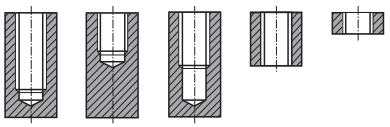
Cold forming taps with oil grooves
Gewindeformer mit Schmiernuten

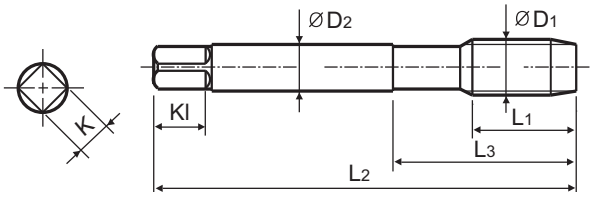
- Suitable for threading soft materials with at least 8-10% elongation.
- The pre-drilling holes are bigger than normal sized holes.

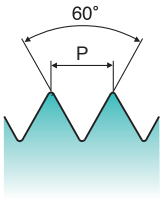
- Geeignet zum Gewindeformen weicher Werkstoffe mit mindestens 8-10% Dehnung.
- Die Kernlochbohrungen sind größer als normale Kernlöcher.

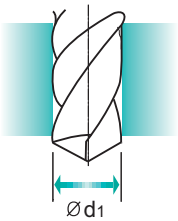
DIN 374

Hole type
3.0×D









Material groups **GV** | HSS-E | DIN 374 | 6HX | 60° | C | Nitride | p.B265

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	P	Ni	L1	L2	L3	ØD2	K	Kl	Ød1
M4	× 0.5	**TE733256**	10	63	21	2.8	2.1	5	3.75
M5	× 0.5	**TE733296**	11	70	25	3.5	2.7	6	4.75
M6	× 0.75	**TE733326**	13	80	30	4.5	3.4	6	5.65
M7	× 0.75	**TE733356**	14	80	30	5.5	4.3	7	6.65
M8	× 1.0	**TE733376**	17	90	36	6	4.9	8	7.5
M10	× 1.0	**TE733446**	18	90	36	7	5.5	8	9.5
M12	× 1.5	**TE733516**	22	100	40	9	7	10	11.25
M12	× 1.0	**TE733536**	18	100	40	9	7	10	11.5
M14	× 1.5	**TE733556**	22	100	40	11	9	12	13.25
M16	× 1.5	**TE733616**	22	100	40	12	9	12	15.25
M18	× 1.5	**TE733676**	25	110	44	14	11	14	17.25

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎						○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	○	○		○		○													

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YG TAP FORMING

TE704 SERIES

UNC

Unified coarse threads

Unified Grobgewinde
UNC
Unificato passo grosso

Cold forming taps with oil grooves
Gewindeformer mit Schmiernuten

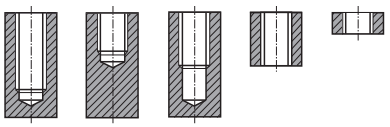
▶ Suitable for threading soft materials with at least 8-10% elongation.
▶ The pre-drilling holes are bigger than normal sized holes.

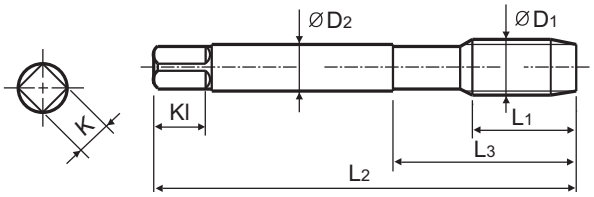
▶ Geeignet zum Gewindeformen weicher Werkstoffe mit mindestens 8-10% Dehnung.
▶ Die Kernlochbohrungen sind größer als normale Kernlöcher.

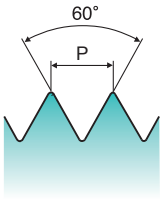
DIN 371

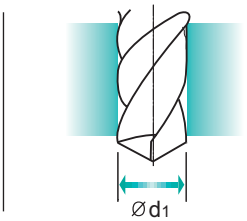
DIN 376

Hole type
3.0×D









Material groups **GV** | HSS-E | DIN 371/376 | 2BX | 60° | C | Nitride

p.B265

Unit : mm

SIZE ØD1	TPI	EDP No. Ni	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	Tapping Drill Diameter Ød1
#5	40 UNC	TE704202	11	56	18	3.5	2.7	6	2.87
#8	32 UNC	TE704282	13	63	21	4.5	3.4	6	3.8
#12	24 UNC	TE704362	16	80	30	6	4.9	8	4.95
1/4	20 UNC	TE704402	17	80	30	7	5.5	8	5.75
5/16	18 UNC	TE704442	20	90	35	8	6.2	9	7.25
3/8	16 UNC	TE704482	22	100	39	9	7	10	8.75
7/16	14 UNC	TE704522	22	100	40	8	6.2	9	10.2

▶ DIN 371(#4~3/8) and DIN 376(7/16~3/4)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎			◎						○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	○	○		○		○													

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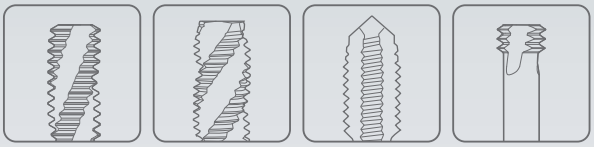
Global Cutting Tool Leader **YG-1**



THREADING

Leading Through Innovation

HSS & HSS-E

YG TAP GENERAL

YG Gewindebohrer Universal

- **Suitable for Tapping Blind / Through Holes due to Flute Geometry and Excellent Chip Evacuation**
- **Geeignet für das Gewindeschneiden von Grund- und Durchgangsbohrungen aufgrund der Nutengeometrie und der hervorragenden Spanabfuhr**

SELECTION GUIDE

YG THREADING TOOLS

HSS & HSS-E
YG TAP GENERAL

Suitable for Tapping Blind / Through Holes
due to Flute Geometry and Excellent Chip Evacuation

HOLE TYPE			Max. 2.5xD Blind Hole		
TOOL MATERIAL			HSS-E		
CHAMFER LEAD ACC. TO DIN2197			C	C	C
FLUTE TYPE			Spiral Flute	Spiral Flute	Spiral Flute
SPIRAL FLUTE ANGLE			R40	R40	R20
SERIES	M	DIN371/376	TC711 (p.B272)	TD711 (p.B273)	TC517 (p.B280)
		DIN352			TC612 (p.B281)
		DIN357/LONG			
	MF	DIN374	TC411 (p.B274)	TD411 (p.B276)	
		DIN2181			
	UNC	DIN371/376	TC144 (p.B277)		
		DIN351			
	UNF	DIN371/374	TC124 (p.B278)		
		DIN2181			
	BSW	DIN2182/2183	TC134 (p.B279)		
		DIN351			
	G(BSP)	DIN5156/5157			
	EG-M	DIN371/376			
	EG-UNC	DIN371/376			
	EG-UNF	DIN371/374			
SURFACE TREATMENT			Bright	TiN	Bright
MODEL					

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B307

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	○	○	○
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15			
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○	○
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10			
	16		Pearlitic (Martensitic)		260	26			
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎
	19	Malleable cast iron	Ferritic		130				
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○	○
	25		> 12% Si, Not Curable		130		◎	◎	◎
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100		◎	◎	◎
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

SELECTION GUIDE

YG THREADING TOOLS

HSS & HSS-E
YG TAP GENERAL

Suitable for Tapping Blind / Through Holes
due to Flute Geometry and Excellent Chip Evacuation

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B307

HOLE TYPE			Max. 2.0xD Blind/Through Hole	
TOOL MATERIAL			HSS	
CHAMFER LEAD ACC. TO DIN2197			I / II / III	I / III
FLUTE TYPE			Straight Flute	Straight Flute
SPIRAL FLUTE ANGLE			-	-
	M	DIN371/376		
		DIN352	T7109 (p.B297)	
		DIN357/LONG		
	MF	DIN374		
		DIN2181		T7309 (p.B299)
	UNC	DIN371/376		
		DIN351		
	UNF	DIN371/374		
		DIN2181		
	BSW	DIN2182/2183		
		DIN351		
	G(BSP)	DIN5156/5157		
	EG-M	DIN371/376		
	EG-UNC	DIN371/376		
	EG-UNF	DIN371/374		
SURFACE TREATMENT			Bright	Bright
MODEL				

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○
	2		About 0.45% C	Annealed	190	13	○	○
	3		About 0.45% C	Quenched & tempered	250	25	○	○
	4		About 0.75% C	Annealed	270	28	○	○
	5		About 0.75% C	Quenched & tempered	300	32		
	6	Low alloy steel		Annealed	180	10	○	○
	7			Quenched & tempered	275	29	○	○
	8			Quenched & tempered	300	32		
	9			Quenched & tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3	○	○
	18		Pearlitic		250	25	○	○
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130		○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○
	27		CuZn, CuSnZn (Brass)		90		○	○
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

YG TAP GENERAL

TC711 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

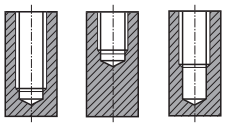
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

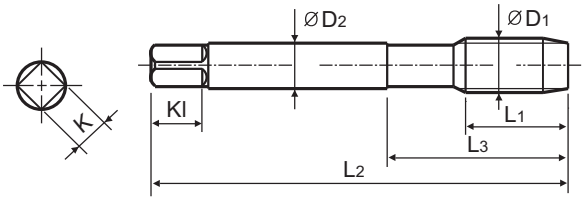
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

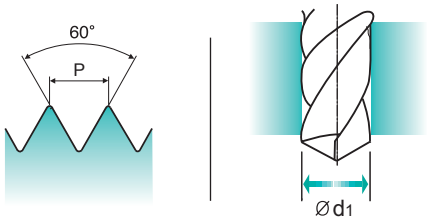
DIN 371

DIN 376

Hole type
2.5×D







Material groups GS | HSS-E | DIN 371/376 | 6H | 60° | C | R40 | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TC711136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TC711156	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	TC711196	8	45	13	2.8	2.1	5	3	1.9
M2.5	× 0.45	TC711176	9	50	15	2.8	2.1	5	3	2.05
M3	× 0.5	TC711206	6	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TC711226	7	56	20	4	3	6	3	2.9
M4	× 0.7	TC711246	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TC711286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TC711316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TC711346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TC711366	13	90	35	8	6.2	9	3	6.8
M9	× 1.25	TC711396	13	90	35	9	7	10	3	7.8
M10	× 1.5	TC711426	15	100	39	10	8	11	3	8.5
M11	× 1.5	TC711466	17	100	40	8	6.2	9	3	9.5
M12	× 1.75	TC711506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TC711546	20	110	44	11	9	12	3	12
M16	× 2.0	TC711606	20	110	44	12	9	12	3	14
M18	× 2.5	TC711656	25	125	50	14	11	14	4	15.5
M20	× 2.5	TC711706	25	140	54	16	12	15	4	17.5
M22	× 2.5	TC711746	25	140	54	18	14.5	17	4	19.5
M24	× 3.0	TC711786	30	160	60	18	14.5	17	4	21
M27	× 3.0	TC711866	30	160	60	20	16	19	4	24
M30	× 3.5	TC711946	35	180	70	22	18	21	4	26.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

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YG-1 CO., LTD.

YG TAP GENERAL

TC411 SERIES

MF ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

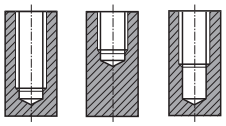
Machine taps
Maschinengewindebohrer

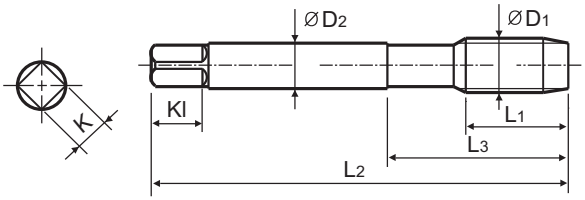
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

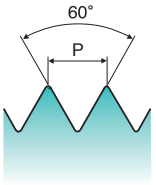
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

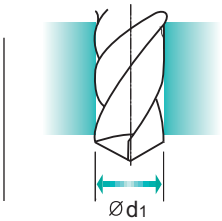
DIN 374

Hole type
2.5×D









Material groups GS | HSS-E | DIN 374 | 6H | 60° | C | R40 | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M4	× 0.5	TC411256	5	63	21	2.8	2.1	5	3	3.5
M5	× 0.5	TC411296	5	70	25	3.5	2.7	6	3	4.5
M6	× 0.75	TC411326	8	80	30	4.5	3.4	6	3	5.2
M6	× 0.5	TC411336	5	80	30	4.5	3.4	6	3	5.5
M7	× 0.75	TC411356	10	80	30	5.5	4.3	7	3	6.2
M8	× 1.0	TC411376	10	90	36	6	4.9	8	3	7
M8	× 0.75	TC411386	8	80	30	6	4.9	8	3	7.2
M8	× 0.5	TC411936	5	80	30	6	4.9	8	3	7.5
M10	× 1.25	TC411436	16	100	40	7	5.5	8	3	8.8
M10	× 1.0	TC411446	10	90	36	7	5.5	8	3	9
M10	× 0.75	TC411456	10	90	36	7	5.5	8	3	9.2
M12	× 1.5	TC411516	15	100	40	9	7	10	3	10.5
M12	× 1.0	TC411536	11	100	40	9	7	10	3	11
M14	× 1.5	TC411556	15	100	40	11	9	12	3	12.5
M14	× 1.25	TC411566	15	100	40	11	9	12	3	12.8
M14	× 1.0	TC411576	11	100	40	11	9	12	3	13
M16	× 1.5	TC411616	15	100	40	12	9	12	3	14.5
M16	× 1.0	TC411626	12	100	40	12	9	12	3	15
M18	× 1.5	TC411676	17	110	44	14	11	14	4	16.5
M18	× 1.0	TC411686	13	110	44	14	11	14	4	17

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

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YG-1 CO., LTD.

YG TAP GENERAL

TD411 SERIES

MF ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

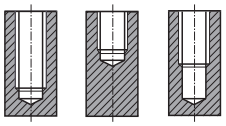
Machine taps
Maschinengewindebohrer

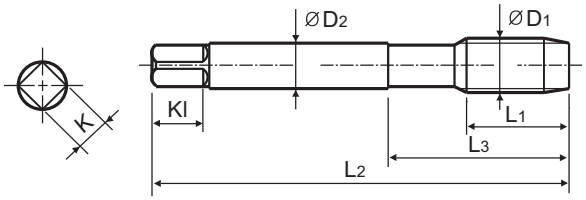
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

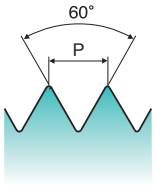
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

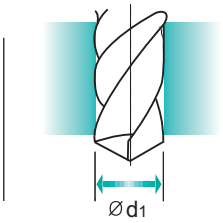
DIN 374

Hole type
2.5×D









Material groups GS | HSS-E | DIN 374 | 6H | 60° | C | R40 | TiN

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M4	× 0.5	TD411256	5	63	21	2.8	2.1	5	3	3.5
M6	× 0.75	TD411326	8	80	30	4.5	3.4	6	3	5.2
M6	× 0.5	TD411336	5	80	30	4.5	3.4	6	3	5.5
M7	× 0.75	TD411356	10	80	30	5.5	4.3	7	3	6.2
M8	× 1.0	TD411376	10	90	36	6	4.9	8	3	7
M8	× 0.5	TD411936	5	80	30	6	4.9	8	3	7.5
M10	× 1.25	TD411436	16	100	40	7	5.5	8	3	8.8
M10	× 1.0	TD411446	10	90	36	7	5.5	8	3	9
M12	× 1.5	TD411516	15	100	40	9	7	10	3	10.5
M12	× 1.0	TD411536	11	100	40	9	7	10	3	11
M14	× 1.5	TD411556	15	100	40	11	9	12	3	12.5
M16	× 1.5	TD411616	15	100	40	12	9	12	3	14.5
M16	× 1.0	TD411626	12	100	40	12	9	12	3	15
M18	× 1.5	TD411676	17	110	44	14	11	14	4	16.5
M18	× 1.0	TD411686	13	110	44	14	11	14	4	17
M30	× 2.0	TD411966	22	150	57	22	18	21	4	28

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

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YG-1 CO., LTD.

YG TAP GENERAL

TC124 SERIES

UNF

Unified fine threads

Unified Feingewinde
UNF
Unificato passo fine

Machine taps
Maschinengewindebohrer

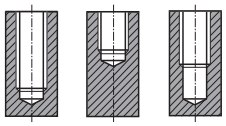
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

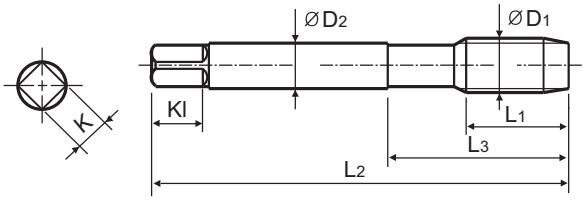
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

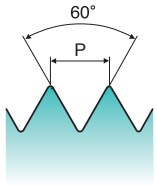
DIN 371

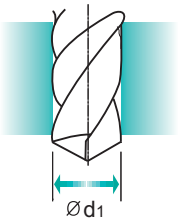
DIN 374

Hole type
2.5×D









Material groups GS | HSS-E | DIN 371/374 | 2B | 60° | C | R40 | Bright

p.B307

Unit : mm

SIZE	TPI	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1		Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
#5	-44UNF	TC124222	7	56	18	3.5	2.7	6	3	2.7
1/4	-28UNF	TC124422	10	80	30	7	5.5	8	3	5.5
5/16	-24UNF	TC124462	10	90	35	8	6.2	9	3	6.9
3/8	-24UNF	TC124502	10	100	39	9	7	10	3	8.5
7/16	-20UNF	TC124542	13	100	40	8	6.2	9	3	9.9
1/2	-20UNF	TC124582	13	100	40	9	7	10	3	11.5
9/16	-18UNF	TC124622	15	100	40	11	9	12	3	12.9
5/8	-18UNF	TC124662	15	100	40	12	9	12	3	14.5
3/4	-16UNF	TC124722	17	110	44	14	11	14	4	17.5
7/8	-14UNF	TC124762	17	125	50	18	14.5	17	4	20.5

▶ DIN 371(#4~3/8) and DIN 374(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

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YG-1 CO., LTD.

YG TAP GENERAL

TC517 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

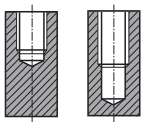
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

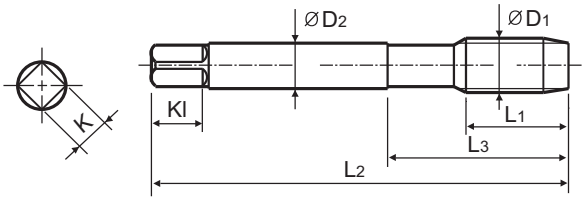
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

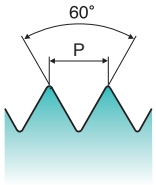
DIN 371

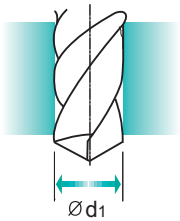
DIN 376

Hole type
2.5×D









Material groups GS | HSS-E | DIN 371/376 | 6H | 60° | C | R20 | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TC517136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TC517156	8	45	13	2.8	2.1	5	3	1.75
M2.5	× 0.45	TC517176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TC517496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TC517206	6	56	18	3.5	2.7	6	3	2.5
M4	× 0.7	TC517246	7	63	21	4.5	3.4	6	3	3.3
M5	× 0.8	TC517286	8	70	25	6	4.9	8	3	4.2
M6	× 1.0	TC517316	10	80	30	6	4.9	8	3	5
M7	× 1.0	TC517346	10	80	30	7	5.5	8	3	6
M8	× 1.25	TC517366	13	90	35	8	6.2	9	3	6.8
M10	× 1.5	TC517426	15	100	39	10	8	11	3	8.5
M12	× 1.75	TC517506	18	110	44	9	7	10	3	10.2
M14	× 2.0	TC517546	20	110	44	11	9	12	3	12
M16	× 2.0	TC517606	20	110	44	12	9	12	3	14
M18	× 2.5	TC517656	25	125	50	14	11	14	4	15.5
M22	× 2.5	TC517746	25	140	54	18	14.5	17	4	19.5
M24	× 3.0	TC517786	30	160	60	18	14.5	17	4	21

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG TAP GENERAL

TC127 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

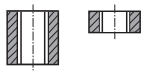
Machine taps
Maschinengewindebohrer

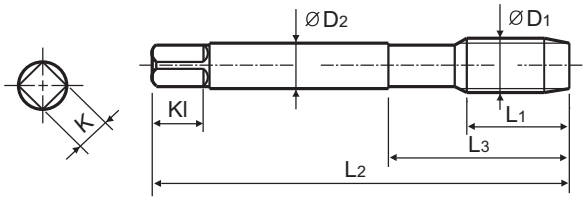
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

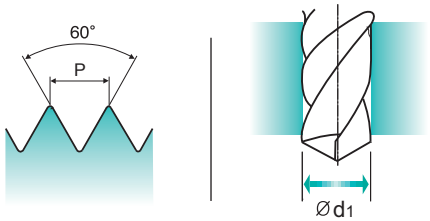
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

DIN 371

Hole type
3.0×D







Material groups GS | HSS-E | DIN 371 | 6H | 60° | B | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2	× 0.4	TC127136	8	45	13	2.8	2.1	5	3	1.6
M2.2	× 0.45	TC127156	8	45	13	2.8	2.1	5	3	1.75
*M2.3	× 0.4	TC127196	8	45	13	2.8	2.1	5	3	1.9
M2.5	× 0.45	TC127176	9	50	15	2.8	2.1	5	3	2.05
*M2.6	× 0.45	TC127496	9	50	15	2.8	2.1	5	3	2.1
M3	× 0.5	TC127206	11	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TC127226	12	56	20	4	3	6	3	2.9
M4	× 0.7	TC127246	13	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TC127266	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	TC127286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TC127316	17	80	30	6	4.9	8	3	5
M7	× 1.0	TC127346	17	80	30	7	5.5	8	3	6
M8	× 1.25	TC127366	20	90	35	8	6.2	9	3	6.8
M9	× 1.25	TC127396	20	90	35	9	7	10	3	7.8
M10	× 1.5	TC127426	22	100	39	10	8	11	3	8.5
M11	× 1.5	TC127466	22	100	39	11	9	12	3	9.5
M12	× 1.75	TC127506	24	110	44	12	9	12	3	10.2

▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG TAP GENERAL

TC122 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

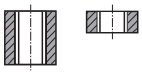
Machine taps
Maschinengewindebohrer

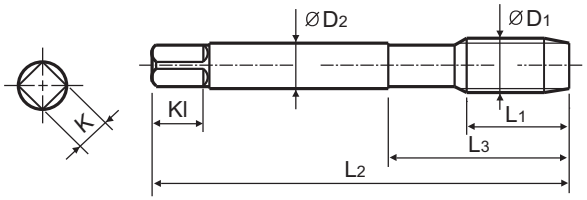
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

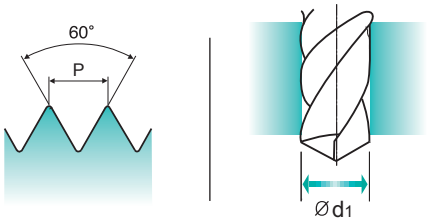
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

DIN 352

Hole type
3.0×D







Material groups GS | HSS-E | DIN 352 | 6H | 60° | B | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	TC122206	11	40	18	3.5	2.7	6	3	2.5
M4	× 0.7	TC122246	13	45	21	4.5	3.4	6	3	3.3
M5	× 0.8	TC122286	16	52	26	6	4.9	8	3	4.2
M6	× 1.0	TC122316	18	56	27	6	4.9	8	3	5
M8	× 1.25	TC122366	20	63	34	6	4.9	8	3	6.8
M10	× 1.5	TC122426	22	70	38	7	5.5	8	3	8.5
M12	× 1.75	TC122506	24	80	45	9	7	10	3	10.2
M14	× 2.0	TC122546	26	80	45	11	9	12	3	12
M16	× 2.0	TC122606	27	80	45	12	9	12	3	14

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

YG TAP GENERAL

TC222 SERIES

MF ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

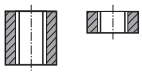
Machine taps
Maschinengewindebohrer

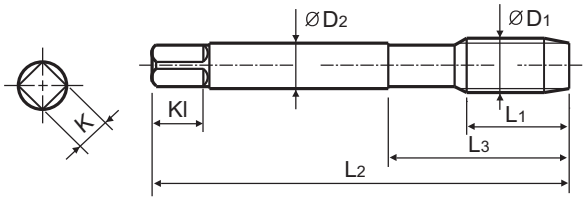
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

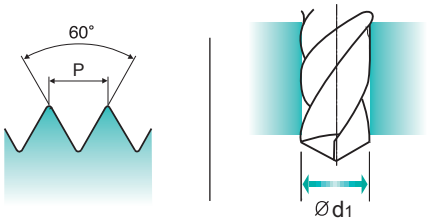
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

DIN 374

Hole type
3.0×D







Material groups GS | HSS-E | DIN 374 | 6H | 60° | B | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M22 × 1.0		TC222776	20	125	50	18	14.5	17	4	21
M24 × 2.0		TC222796	27	140	54	18	14.5	17	4	22
M24 × 1.5		TC222806	27	140	54	18	14.5	17	4	22.5
M26 × 1.5		TC222856	28	140	54	18	14.5	17	4	24.5
M27 × 2.0		TC222876	28	140	54	20	16	19	4	25
M27 × 1.5		TC222886	28	140	54	20	16	19	4	25.5
M28 × 1.5		TC222916	28	140	54	20	16	19	4	26.5
M30 × 2.0		TC222966	30	150	57	22	18	21	4	28
M30 × 1.5		TC222976	30	150	57	22	18	21	4	28.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

YG TAP GENERAL

TC214 SERIES

UNC Unified coarse threads

Unified Grobgewinde
UNC
Unificato passo grosso

Machine taps
Maschinengewindebohrer

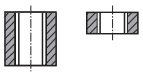
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

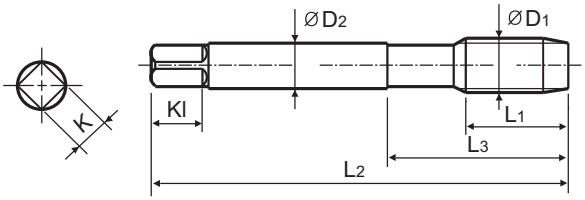
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

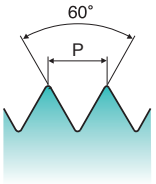
DIN 371

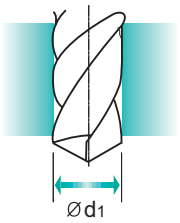
DIN 376

Hole type
3.0×D









Material groups GS | HSS-E | DIN 371/376 | 2B | 60° | B | Bright

p.B307

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	40UNC	TC214162	11	56	18	3.5	2.7	6	3	2.3
#5	40UNC	TC214202	11	56	18	3.5	2.7	6	3	2.6
#6	32UNC	TC214242	12	56	20	4	3	6	3	2.85
#8	32UNC	TC214282	13	63	21	4.5	3.4	6	3	3.5
#10	24UNC	TC214322	15	70	25	6	4.9	8	3	3.9
#12	24UNC	TC214362	16	80	30	6	4.9	8	3	4.5
1/4	20UNC	TC214402	17	80	30	7	5.5	8	3	5.2
5/16	18UNC	TC214442	20	90	35	8	6.2	9	3	6.6
3/8	16UNC	TC214482	22	100	39	9	7	10	3	8
7/16	14UNC	TC214522	22	100	40	8	6.2	9	3	9.4
1/2	13UNC	TC214562	25	110	44	9	7	10	3	10.75
9/16	12UNC	TC214602	26	110	44	11	9	12	3	12.25
5/8	11UNC	TC214642	27	110	44	12	9	12	3	13.5
3/4	10UNC	TC214702	30	125	50	14	11	14	4	16.5
7/8	9UNC	TC214742	32	140	54	18	14.5	17	4	19.5
1	8UNC	TC214782	36	160	60	20	16	19	4	22.25
1-1/8	7UNC	TC214822	40	180	70	22	18	21	4	25

▶ DIN 371(#4~3/8) and DIN 376(7/16~1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

YG TAP GENERAL

TC224 SERIES

BSW Whitworth threads

Whitworth Gewinde
BSW
Filettatura Whitworth

Machine taps
Maschinengewindebohrer

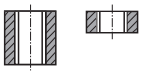
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

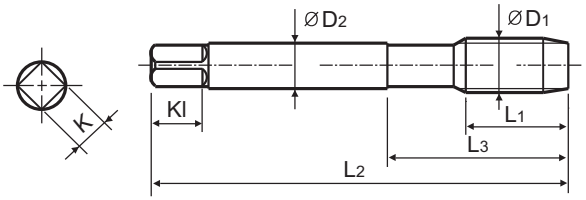
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

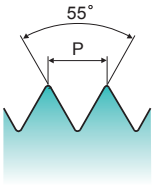
DIN 2182

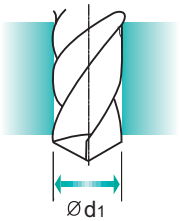
DIN 2183

Hole type
3.0×D









Material groups GS | HSS-E | DIN 2182/2183 | 6H | 55° | B | Bright

p.B307

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
W1/8	- 40	TC224200	11	56	18	3.5	2.7	6	3	2.5
W5/32	- 32	TC224280	13	63	21	4.5	3.4	6	3	3.1
W3/16	- 24	TC224320	15	70	25	6	4.9	8	3	3.6
W7/32	- 24	TC224360	16	80	30	6	4.9	8	3	4.4
W1/4	- 20	TC224400	17	80	30	7	5.5	8	3	5.1
W5/16	- 18	TC224440	20	90	35	8	6.2	9	3	6.5
W3/8	- 16	TC224480	22	100	39	9	7	10	3	7.9
W7/16	- 14	TC224520	22	100	40	8	6.2	9	3	9.3
W1/2	- 12	TC224560	25	110	44	9	7	10	3	10.5
W5/8	- 11	TC224640	27	110	44	12	9	12	3	13.5
W3/4	- 10	TC224700	30	125	50	14	11	14	4	16.5
W7/8	- 9	TC224740	32	140	54	18	14.5	17	4	19.25
W1	- 8	TC224780	36	160	60	20	16	19	4	22
W1-1/8	- 7	TC224820	40	180	65	22	18	21	4	24.75

▶ DIN 2182(W1/8~W3/8) and DIN 2183(W7/16~W1-1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

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YG TAP GENERAL

TD227 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

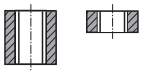
Machine taps
Maschinengewindebohrer

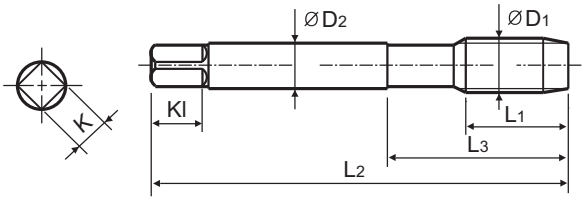
▶ Suitable for through hole in more cutting speed than other taps due to thick web.

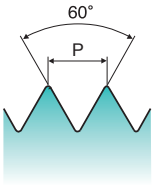
▶ Geeignet für Durchgangslöcher in höherer Schnittgeschwindigkeit als bei anderen Gewindebohrern dank größerer Kerndicke.

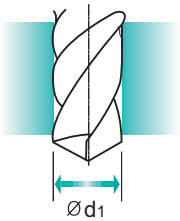
DIN 376

Hole type
3.0×D









Material groups GS | HSS-E | DIN 376 | 6H | 60° | B | TiN

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	TiN	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	TD227206	11	56	18	2.2	1.8	5	3	2.5
M3.5	× 0.6	TD227226	12	56	20	2.5	2.1	5	3	2.9
M4	× 0.7	TD227246	13	63	21	2.8	2.1	5	3	3.3
M4.5	× 0.75	TD227266	14	70	25	3.5	2.7	6	3	3.7
M5	× 0.8	TD227286	15	70	25	3.5	2.7	6	3	4.2
M6	× 1.0	TD227316	17	80	30	4.5	3.4	6	3	5
M7	× 1.0	TD227346	17	80	30	5.5	4.3	7	3	6
M8	× 1.25	TD227366	20	90	36	6	4.9	8	3	6.8
M9	× 1.25	TD227396	20	90	36	7	5.5	8	3	7.8
M10	× 1.5	TD227426	22	100	40	7	5.5	8	3	8.5
M11	× 1.5	TD227466	22	100	40	8	6.2	9	3	9.5
M12	× 1.75	TD227506	24	110	44	9	7	10	3	10.2
M14	× 2.0	TD227546	26	110	44	11	9	12	3	12
M16	× 2.0	TD227606	27	110	44	12	9	12	3	14
M18	× 2.5	TD227656	30	125	50	14	11	14	4	15.5
M20	× 2.5	TD227706	32	140	54	16	12	15	4	17.5
M22	× 2.5	TD227746	32	140	54	18	14.5	17	4	19.5
M24	× 3.0	TD227786	34	160	60	18	14.5	17	4	21
M30	× 3.5	TD227946	40	180	70	22	18	21	4	26.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	○	◎	◎	○				○	○				◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○		○	○	◎	○		◎													

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YG TAP GENERAL

TC463 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

Machine taps
Maschinengewindebohrer

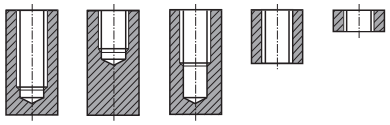
▶ Suitable for tapping shallow holes and the blind holes having enough chip space at the bottom of holes.

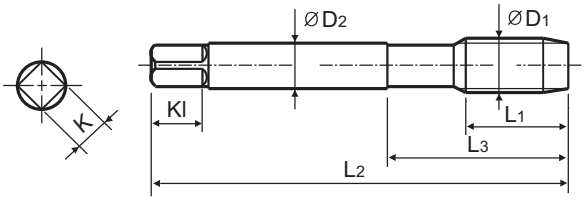
▶ Geeignet zum Schneiden von kurzem Durchgangsgewinde und in Sacklöchern mit ausreichendem Raum für Späne am Bohrungsgrund.

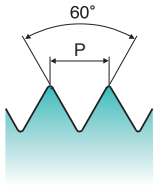
DIN 371

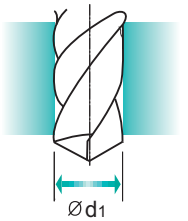
DIN 376

Hole type
2.0×D









Material groups GS | HSS-E | DIN 371/376 | 6H | 60° | C | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	TC463206	11	56	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TC463226	12	56	20	4	3	6	3	2.9
M4	× 0.7	TC463246	13	63	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TC463266	14	70	25	6	4.9	8	3	3.7
M5	× 0.8	TC463286	15	70	25	6	4.9	8	3	4.2
M6	× 1.0	TC463316	17	80	30	6	4.9	8	3	5
M8	× 1.25	TC463366	20	90	35	8	6.2	9	3	6.8
M10	× 1.5	TC463426	22	100	39	10	8	11	3	8.5
M12	× 1.75	TC463506	24	110	44	9	7	10	3	10.2
M14	× 2.0	TC463546	26	110	44	11	9	12	3	12
M16	× 2.0	TC463606	27	110	44	12	9	12	3	14
M18	× 2.5	TC463656	30	125	50	14	11	14	4	15.5

▶ DIN 371(M2~M10) and DIN 376(M11~M30)
▶ * DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○				○	○		○	○	○	○		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended					○	○	○														

YG TAP GENERAL

TC424 SERIES

UNC

Unified coarse threads

Unified Grobgewinde
UNC
Unificato passo grosso

Machine taps
Maschinengewindebohrer

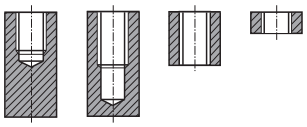
▶ Suitable for tapping shallow holes.

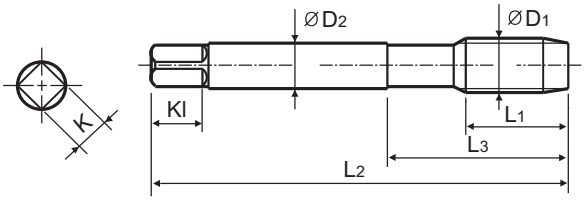
▶ Geeignet zum Gewindeschneiden flacher Sacklöcher.

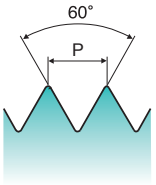
DIN 371

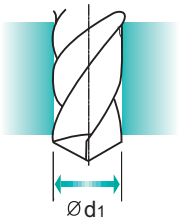
DIN 376

Hole type
2.0×D









Material groups GS | HSS-E | DIN 371/376 | 2B | 60° | C | Bright

p.B307

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	40UNC	TC424162	11	56	18	3.5	2.7	6	3	2.3
1/4	20UNC	TC424402	17	80	30	7	5.5	8	3	5.2
3/8	16UNC	TC424482	22	100	39	9	7	10	3	8
7/16	14UNC	TC424522	22	100	40	8	6.2	9	3	9.4
1/2	13UNC	TC424562	25	110	44	9	7	10	3	10.75
9/16	12UNC	TC424602	26	110	44	11	9	12	3	12.25
5/8	11UNC	TC424642	27	110	44	12	9	12	3	13.5
1	8UNC	TC424782	36	160	60	20	16	19	4	22.25

▶ DIN 371(#4~3/8) and DIN 376(7/16~1- 1/8)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○				○	○		○	○	○	○		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended					○	○	○														

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YG TAP GENERAL

T7109 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

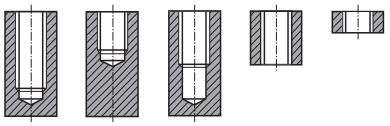
Sets of taps
Gewindebohrer-Satz

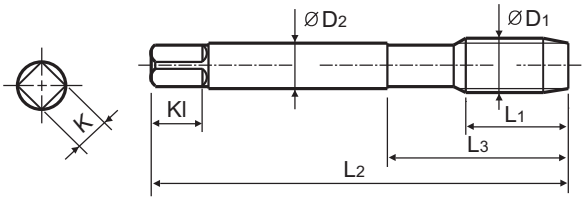
▶ This tap is a serial hand tap in set, First, Second and Bottoming.
▶ Bottoming tap of set has final internal thread dimensions only.

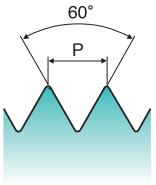
▶ Dies ist ein Handgewindebohrer im Satz mit Vor-, Mittel- und Fertigschneider.
▶ Nur der Fertigschneider kann das gewünschte Gewinde schneiden.

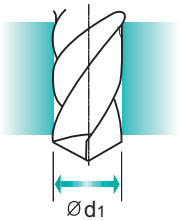
First
Second
Bottoming

Hole type
2.0×D









Material groups GS | HSS | DIN 352 | 6H | 60° | I/II/III | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M22	× 2.5	T7109749	32	100	62	18	14.5	17	4	19.5
M24	× 3.0	T7109789	34	110	69	18	14.5	17	4	21
M27	× 3.0	T7109869	36	110	69	20	16	19	4	24
M30	× 3.5	T7109949	40	125	77	22	18	21	4	26.5
M33	× 3.5	T7109A49	40	125	77	25	20	23	4	29.5
M36	× 4.0	T7109B39	50	150	88	28	22	25	4	32
M39	× 4.0	T7109C09	50	150	88	32	24	27	4	35
M42	× 4.5	T7109C89	56	150	88	32	24	27	4	37.5
M45	× 4.5	T7109D59	58	160	93	36	29	32	4	40.5
M52	× 5.0	T7109F39	65	180	102	40	32	35	4	47

▶ *DIN profile not ISO

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○										○	○		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended					○	○	○														

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YG TAP GENERAL

T7309 SERIES

MF ISO metric fine threads DIN 13

Metrisches ISO-Feingewinde DIN 13
ISO MÉTRIQUE PAS FINS DIN13
ISO Metrico passo fine DIN 13

Sets of taps
Gewindebohrer-Satz

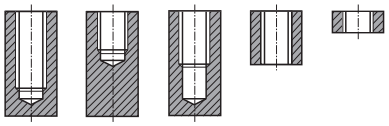
▶ This tap is a serial hand tap in set, First and Bottoming.
▶ Bottoming tap of set has final internal thread dimensions only.

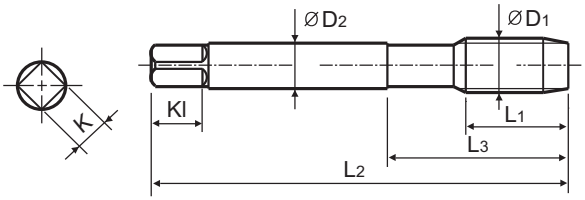
▶ Handgewindebohrersatz mit Vor- und Fertigschneider.
▶ Nur der Fertigschneider kann das gewünschte Gewinde schneiden.

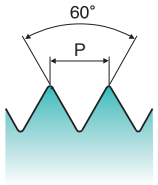
First

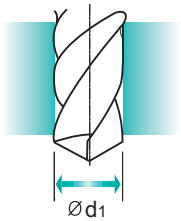
Bottoming

Hole type
2.0×D









Material groups GS | HSS | DIN 2181 | 6H | 60° | I/III | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M16 × 1.0		T7309629	18	70	32	12	9	12	4	15
M18 × 2.0		T7309669	22	80	35	14	11	14	4	16
M18 × 1.5		T7309679	22	80	35	14	11	14	4	16.5
M18 × 1.0		T7309689	18	80	35	14	11	14	4	17
M20 × 2.0		T7309719	22	80	35	16	12	15	4	18
M20 × 1.5		T7309729	22	80	35	16	12	15	4	18.5
M22 × 2.0		T7309759	22	80	35	18	14.5	17	4	20
M22 × 1.5		T7309769	22	80	35	18	14.5	17	4	20.5
M22 × 1.0		T7309779	18	80	35	18	14.5	17	4	21
M24 × 2.0		T7309799	22	90	40	18	14.5	17	4	22
M24 × 1.5		T7309809	22	90	40	18	14.5	17	4	22.5
M24 × 1.0		T7309819	18	90	40	18	14.5	17	4	23
M25 × 1.5		T7309839	22	90	40	18	14.5	17	4	23.5
M25 × 1.0		T7309849	18	90	40	18	14.5	17	4	24
M26 × 1.5		T7309859	22	90	40	18	14.5	17	4	24.5
M27 × 2.0		T7309879	22	90	40	20	16	19	4	25
M27 × 1.5		T7309889	22	90	40	20	16	19	4	25.5
M27 × 1.0		T7309899	18	90	40	20	16	19	4	26
M28 × 2.0		T7309909	22	90	40	20	16	19	4	26
M28 × 1.5		T7309919	22	90	40	20	16	19	4	26.5
M30 × 2.0		T7309969	22	90	40	22	18	21	4	28
M30 × 1.5		T7309979	22	90	40	22	18	21	4	28.5
M30 × 1.0		T7309989	18	90	40	22	18	21	4	29

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○										○	○		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended					○	○	○														

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

YG TAP GENERAL

T7509 SERIES

UNF

Unified fine threads

Unified Feingewinde
UNF
Unificato passo fine

Sets of taps
Gewindebohrer-Satz

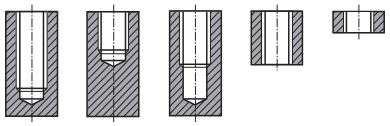
▶ This tap is a serial hand tap in set, First and Bottoming.
▶ Bottoming tap of set has final internal thread dimensions only.

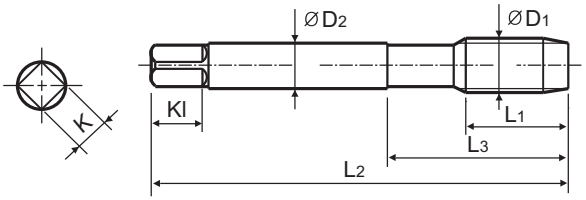
▶ Handgewindebohrersatz mit Vor- und Fertigschneider.
▶ Nur der Fertigschneider kann das gewünschte Gewinde schneiden.

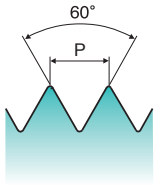
First

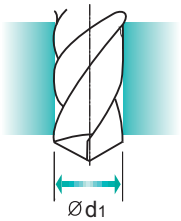
Bottoming

Hole type
2.0×D









Material groups GS | HSS | DIN 2181 | 2B | 60° | I/III | Bright

p.B307

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	48 UNF	T7509189	10	42	18	3.5	2.7	6	3	2.4
#5	44 UNF	T7509229	10	42	18	3.5	2.7	6	3	2.7
#6	40 UNF	T7509269	11	45	18	4	3	6	3	3
#8	36 UNF	T7509309	12	48	23	4.5	3.4	6	3	3.5
#10	32 UNF	T7509349	14	52	22	6	4.9	8	3	4.1
#12	28 UNF	T7509389	16	56	24	6	4.9	8	3	4.7
1/4	28 UNF	T7509429	16	56	24	6	4.9	8	3	5.5
5/16	24 UNF	T7509469	17	63	27	6	4.9	8	3	6.9
3/8	24 UNF	T7509509	18	63	27	7	5.5	8	4	8.5
7/16	20 UNF	T7509549	20	70	32	8	6.2	9	4	9.9
1/2	20 UNF	T7509589	20	70	32	9	7	10	4	11.5
9/16	18 UNF	T7509629	20	70	32	11	9	12	4	12.9
5/8	18 UNF	T7509669	20	70	32	12	9	12	4	14.5
3/4	16 UNF	T7509729	22	80	38	14	11	14	4	17.5
7/8	14 UNF	T7509769	22	80	38	18	14.5	17	4	20.5
1	12 UNF	T7509809	22	90	40	18	14.5	17	4	23.25
1-1/8	12 UNF	T7509849	22	90	40	22	18	21	4	26.5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○										○	○		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended					○	○	○														

YG TAP GENERAL

T7343 SERIES

M-LH ISO metric coarse threads DIN 13

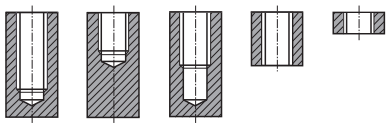
Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

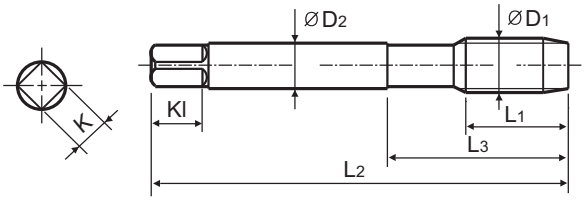
Sets of taps
Gewindebohrer-Satz

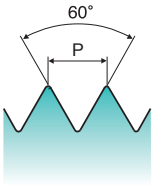
▶ This tap is a serial hand tap in set, First, Second and Bottoming.
▶ Bottoming tap of set has final internal thread dimensions only.

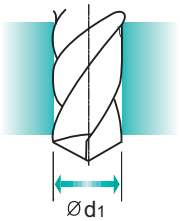
▶ Dies ist ein Handgewindebohrer im Satz mit Vor-, Mittel- und Fertigschneider.
▶ Nur der Fertigschneider kann das gewünschte Gewinde schneiden.

Hole type
2.0×D









Material groups GS | HSS | DIN 352 | 6H | 60° | I/II/III | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	**T7343209**	11	40	18	3.5	2.7	6	3	2.5
M4	× 0.7	**T7343249**	13	45	21	4.5	3.4	6	3	3.3
M5	× 0.8	**T7343289**	16	52	26	6	4.9	8	3	4.2
M6	× 1.0	**T7343319**	18	56	27	6	4.9	8	3	5
M8	× 1.25	**T7343369**	20	63	34	6	4.9	8	3	6.8
M10	× 1.5	**T7343429**	22	70	38	7	5.5	8	4	8.5
M12	× 1.75	**T7343509**	24	80	45	9	7	10	4	10.2
M14	× 2.0	**T7343549**	26	80	45	11	9	12	4	12
M16	× 2.0	**T7343609**	27	80	45	12	9	12	4	14
M18	× 2.5	**T7343659**	30	95	58	14	11	14	4	15.5
M20	× 2.5	**T7343709**	32	95	58	16	12	15	4	17.5
M22	× 2.5	**T7343749**	32	100	62	18	14.5	17	4	19.5
M24	× 3.0	**T7343789**	34	110	69	18	14.5	17	4	21

▶ LH=Left hand thread

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○										○	○		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended					○	○	○														

YG TAP GENERAL

TC353 SERIES

M ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13
ISO MÉTRIQUE DIN13
ISO Metrico passo grosso DIN 13

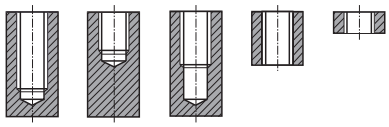
Sets of taps
Gewindebohrer-Satz

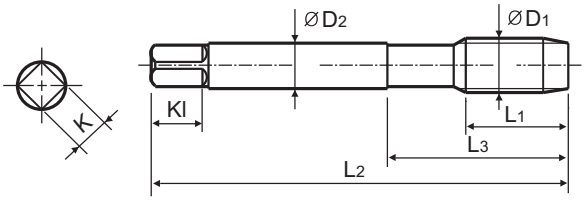
▶ This tap is a serial hand tap in set, First, Second and Bottoming.
▶ Bottoming tap of set has final internal thread dimensions only..

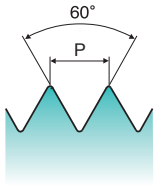
▶ Dies ist ein Handgewindebohrer im Satz mit Vor-, Mittel- und Fertigschneider.
▶ Nur der Fertigschneider kann das gewünschte Gewinde schneiden.

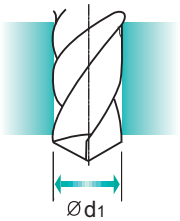
First
Second
Bottoming

Hole type
2.0×D









Material groups VG | HSS-E | DIN 352 | 6H | 60° | I/II/III | Bright

p.B307

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M3	× 0.5	TC353209	11	40	18	3.5	2.7	6	3	2.5
M3.5	× 0.6	TC353229	13	45	21	4	3	6	3	2.9
M4	× 0.7	TC353249	13	45	21	4.5	3.4	6	3	3.3
M4.5	× 0.75	TC353269	16	50	25	6	4.9	8	3	3.7
M5	× 0.8	TC353289	16	52	26	6	4.9	8	3	4.2
M6	× 1.0	TC353319	18	56	27	6	4.9	8	3	5
M8	× 1.25	TC353369	20	63	34	6	4.9	8	3	6.8
M10	× 1.5	TC353429	22	70	38	7	5.5	8	4	8.5
M12	× 1.75	TC353509	24	80	45	9	7	10	4	10.2
M14	× 2.0	TC353549	26	80	45	11	9	12	4	12
M16	× 2.0	TC353609	27	80	45	12	9	12	4	14
M18	× 2.5	TC353659	30	95	58	14	11	14	4	15.5
M20	× 2.5	TC353709	32	95	58	16	12	15	4	17.5

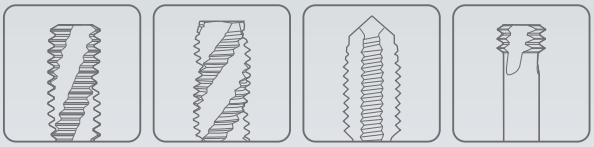
▶ First with pilot guide

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○													

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended																					

Global Cutting Tool Leader **YG-1**



THREADING

Leading Through Innovation

HSS & HSS-E

PIPE TAP
GASGEWINDEBOHRER

- **Tapping Whitworth Pipe threads**
- **Zum Gewindeschneiden von Whitworth-Rohrgewinden**

SELECTION GUIDE

YG THREADING TOOLS

HSS & HSS-E PIPE TAP

Tapping Whitworth Pipe threads

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B316

HOLE TYPE			Max. 2.0xD Blind/Through Hole	Max. 2.5xD Blind Hole			Max. 3.0xD Through Hole
TOOL MATERIAL			HSS	HSS-E			
CHAMFER LEAD ACC. TO DIN2197			I/III	C			B
FLUTE TYPE			Straight Flute	Spiral Flute			Spiral Point
SPIRAL FLUTE ANGLE			-	R40	R40	R40	-
SERIES	M	DIN371/376					
		DIN352					
		DIN357/LONG					
	MF	DIN374					
		DIN2181					
	UNC	DIN371/376					
		DIN351					
	UNF	DIN371/374					
		DIN2181					
	BSW	DIN2182/2183					
		DIN351					
	G(BSP)	DIN5156/5157	T7709 (p.B311)	TC728 (p.B312)	TC729 (p.B313)	TB514 (p.B314)	TC727 (p.B315)
	EG-M	DIN371/376					
	EG-UNC	DIN371/376					
	EG-UNF	DIN371/374					
SURFACE TREATMENT			Bright	Bright	Bright	VAP	Bright
MODEL							

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc					
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○			◎	
	2		About 0.45% C	Annealed	190	13	○	◎		◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	○	◎			◎
	4		About 0.75% C	Annealed	270	28		◎			◎
	5		About 0.75% C	Quenched & Tempered	300	32					
	6	Low alloy steel		Annealed	180	10	○	◎	○		◎
	7			Quenched & Tempered	275	29		◎	○		◎
	8			Quenched & Tempered	300	32			◎		
	9			Quenched & Tempered	350	38			◎		
	10	High alloyed steel, and tool steel		Annealed	200	15					
	11			Quenched & Tempered	325	35					
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				◎	
	13		Martensitic	Quenched & Tempered	240	23				◎	
	14		Austenitic		180	10			○	◎	
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○				
	16		Pearlitic (Martensitic)		260	26	○				
	17	Nodular cast iron	Ferritic		160	3		◎			◎
	18		Pearlitic		250	25		◎			◎
	19	Malleable cast iron	Ferritic		130						
	20		Pearlitic		230	21					
N	21	Aluminum-wrought alloy	Not Curable		60		○	○			○
	22		Curable	Hardened	100		○	○			○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○			○
	24		≤ 12% Si, Curable	Hardened	90			○			○
	25		> 12% Si, Not Curable		130			◎			◎
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			◎			◎
	27		CuZn, CuSnZn (Brass)		90			○			○
	28		CuSn, lead-free copper and electrolytic copper		100						
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm						
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55					
	39			Hardened	630	60					
	40	Chilled Cast Iron		Cast	400	42					
	41	Hardened Cast Iron		Hardened	550	55					

PIPE TAP

TC728 SERIES

G(BSP) Whitworth pipe threads DIN ISO 228/1

Whitworth Rohrgewinde DIN ISO 228/1
G(BSP) PROFIL 55° DIN ISO 228/1
Filettatura Whitworth per tubi DIN ISO 228/1

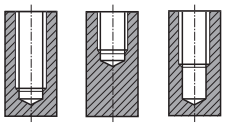
Machine taps
Maschinengewindebohrer

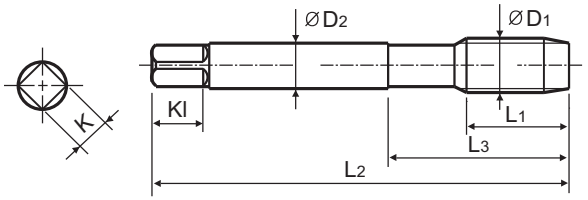
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

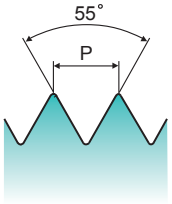
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

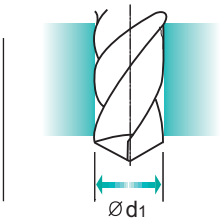
DIN 5156

Hole type
2.5×D









Material groups **GS** | HSS-E | DIN 5156 | 55° | C | R40 | Bright

p.B316

Unit : mm

SIZE	TPI	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1		Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
G1/8	- 28	TC728200	20	90	36	7	5.5	8	3	8.8
G1/4	- 19	TC728400	22	100	40	11	9	12	3	11.8
G3/8	- 19	TC728480	22	100	40	12	9	12	3	15.25
G1/2	- 14	TC728560	25	125	50	16	12	15	4	19
G3/4	- 14	TC728700	28	140	54	20	16	19	4	24.5
G1	- 11	TC728780	30	160	60	25	20	23	4	30.75

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended		◎	◎	◎		◎	◎										◎	◎		

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	◎	◎	○														

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

PIPE TAP

TB514 SERIES

G(BSP) Whitworth pipe threads DIN ISO 228/1

Whitworth Rohrgewinde DIN ISO 228/1
G(BSP) PROFIL 55° DIN ISO 228/1
Filettatura Whitworth per tubi DIN ISO 228/1

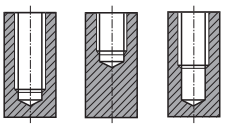
Machine taps
Maschinengewindebohrer

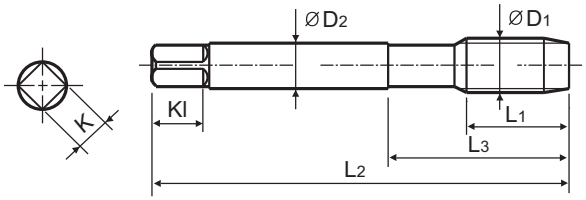
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

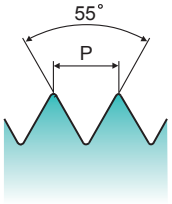
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

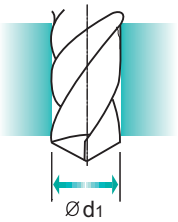
DIN 5156

Hole type
2.5×D









Material groups VA NW | HSS-E | DIN 5156 | 55° | C | R40 | Vap

p.B316

Unit : mm

SIZE ØD1	TPI	EDP No. Vap	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
G1/8	- 28	TB514200	20	90	36	7	5.5	8	3	8.8
G1/4	- 19	TB514400	22	100	40	11	9	12	3	11.8
G3/8	- 19	TB514480	22	100	40	12	9	12	3	15.25
G1/2	- 14	TB514560	25	125	50	16	12	15	4	19
G3/4	- 14	TB514700	28	140	54	20	16	19	4	24.5
G1	- 11	TB514780	30	160	60	25	20	23	4	30.75

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎										◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

PIPE TAP

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

					TC728	TC729	TB514	TC727
ISO	VDI 3323	Material Description	HB	HRc	Vc (m/min.)			
P	1	Non-alloy steel	125				15-20	
	2		190	13	15-20		15-20	15-20
	3		250	25	12-18			12-18
	4		270	28	10-15			10-15
	5		300	32				
	6	Low alloy steel	180	10	10-15	10-15		10-15
	7		275	29	10-15	10-15		10-15
	8		300	32		6-10		
	9		350	38		3-5		
M	12	Stainless steel	200	15			7-10	
	13		240	23			5-8	
	14		180	10		4-6	4-6	
K	17	Nodular cast iron	160	3	10-15			10-15
	18		250	25	5-8			5-8
N	21	Aluminum-wrought alloy	60		10-15			10-15
	22		100		10-15			10-15
	23	Aluminum-cast, alloyed	75		15-20			15-20
	24		90		15-20			15-20
	25		130		10-15			10-15
	26	Copper and Copper Alloys (Bronze / Brass)	110		25-35			25-35
	27		90		8-12			8-12

Leading Through Innovation

HSS-E

SCREW THREAD INSERT TAP

EINSATZGEWINDE INSERT TAPS

- Tapping STI Threads of Soft Materials
- Gewindeschneiden von STI-Gewinden in weichen Materialien

SELECTION GUIDE

YG THREADING TOOLS

HSS-E SCREW THREAD INSERT TAP

Tapping STI Threads of Soft Materials

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B324

			Max. 2.5xD Blind Hole	Max. 3.0xD Through Hole
HOLE TYPE				
TOOL MATERIAL			HSS-E	
CHAMFER LEAD ACC. TO DIN2197			C	B
FLUTE TYPE			Spiral Flute	Spiral Point
SPIRAL FLUTE ANGLE			R40	-
SERIES	M	DIN371/376		
		DIN352		
		DIN357/LONG		
	MF	DIN374		
		DIN2181		
	UNC	DIN371/376		
		DIN351		
	UNF	DIN371/374		
		DIN2181		
	BSW	DIN2182/2183		
		DIN351		
	G(BSP)	DIN5156/5157		
	EG-M	DIN371/376	TC909(p.B319)	TC973(p.B320)
	EG-UNC	DIN371/376	TC944(p.B321)	TC934(p.B322)
	EG-UNF	DIN371/374		TC954(p.B323)
SURFACE TREATMENT			Bright	Bright
MODEL				

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○
	2		About 0.45% C	Annealed	190	13	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	○	○
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10		
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎
	22		Curable	Hardened	100		◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90		◎	◎
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

SCREW THREAD INSERT TAP

TC973 SERIES

EG-M ISO metric coarse threads for Screw Thread insert

Metrisches ISO Regelgew.f.Gew. Drahteins
ISO MÉTRIQUE DIN13 POUR FILETS RAPPORTÉS
ISO Metrico passo grosso per Helicoil

Machine taps
Maschinengewindebohrer

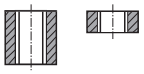
▶ Wire insert threads are used for increasing fastening strength in soft materials.

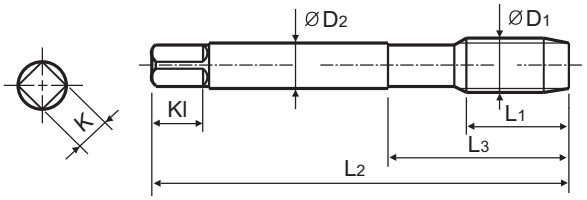
▶ Gewinde mit Drahteinsätzen werden verwendet um größere Drehmomente in weichen Werkstoffen zu erreichen.

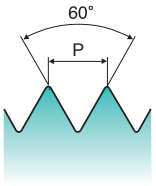
DIN 371

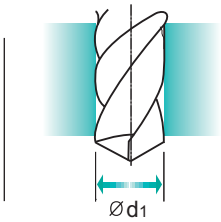
DIN 376

Hole type
3.0×D









Material groups **Al** | HSS-E | DIN 371/376 | 6H Mod. | 60° | B | Bright

p.B324

Unit : mm

SIZE	Pitch	EDP No.	Thread Length	Overall Length	Neck Length	Shank Diameter	Square Size	Square Length	No. of Flute	Tapping Drill Diameter
ØD1	P	Bright	L1	L2	L3	ØD2	K	Kl	Z	Ød1
M2.5	× 0.45	TC973176	11	56	18	3.5	2.7	6	3	2.65
M3	× 0.5	TC973206	10	63	21	4.5	3.4	6	3	3.15
M3.5	× 0.6	TC973226	14	70	25	6	4.9	8	3	3.7
M4	× 0.7	TC973246	13	70	25	6	4.9	8	3	4.2
M5	× 0.8	TC973286	13	80	30	6	4.9	8	3	5.25
M6	× 1.0	TC973316	17	90	35	8	6.2	9	3	6.3
M8	× 1.25	TC973366	18	100	39	10	8	11	3	8.4
M10	× 1.5	TC973426	22	110	44	9	7	10	3	10.4
M12	× 1.75	TC973506	26	110	44	11	9	12	3	12.5
M18	× 2.5	TC973656	32	140	54	18	14.5	17	4	18.75
M20	× 2.5	TC973706	34	160	60	18	14.5	17	4	20.75

▶ DIN 371(M2.5~M8) and DIN 376(M10~M20)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○																	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
Recommended	◎	◎	◎	◎			◎														

SCREW THREAD INSERT TAP

TC934 SERIES

EG-UNC

Unified coarse threads for Screw Thread insert

Unified Regelgew.f.Gew.Drahteins
UNC POUR FILETS RAPPORTÉS
ISO Metrico passo grosso per Helicoil

Machine taps
Maschinengewindebohrer

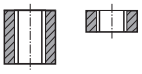
▶ Wire insert threads are used for increasing fastening strength in soft materials.

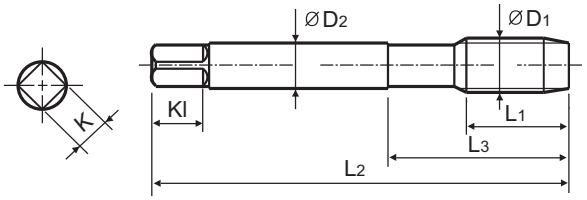
▶ Gewinde mit Drahteinsätzen werden verwendet um größere Drehmomente in weichen Werkstoffen zu erreichen.

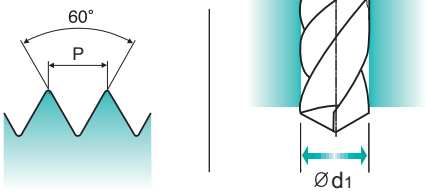
DIN 371

DIN 376

Hole type
3.0×D







Material groups **Al** | HSS-E | DIN 371/376 | 2B | 60° | B | Bright

p.B324

Unit : mm

SIZE ØD1	TPI	EDP No. Bright	Thread Length L1	Overall Length L2	Neck Length L3	Shank Diameter ØD2	Square Size K	Square Length Kl	No. of Flute Z	Tapping Drill Diameter Ød1
#4	- 40 UNC	**TC934162**	13	63	21	4.5	3.4	6	3	3.1
#5	- 40 UNC	**TC934202**	13	63	21	4.5	3.4	6	3	3.4
#8	- 32 UNC	**TC934282**	13	80	25	6	4.9	8	3	4.4
#10	- 24 UNC	**TC934322**	17	80	30	7	5.5	8	3	5.2
#12	- 24 UNC	**TC934362**	17	80	30	7	5.5	8	3	5.8
1/4	- 20 UNC	**TC934402**	20	90	35	8	6.2	9	3	6.7
5/16	- 18 UNC	**TC934442**	22	100	39	10	8	11	3	8.4
3/8	- 16 UNC	**TC934482**	21	110	39	12	9	12	3	10
7/16	- 14 UNC	**TC934522**	26	110	44	11	9	12	3	11.6
1/2	- 13 UNC	**TC934562**	27	110	44	12	9	12	3	13.3
9/16	- 12 UNC	**TC934602**	30	125	50	14	11	14	3	15

▶ DIN 371(#4~3/8) and DIN 376(7/16~3/4)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○																	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎			◎														

SCREW THREAD INSERT TAP

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

					TC909 TC944	TC973 TC934 TC954
ISO	VDI 3323	Material Description	HB	HRc	Vc (m/min.)	
P	1	Non-alloy steel	125		15-20	15-20
	2		190	13	15-20	15-20
	3		250	25	12-18	12-18
N	21	Aluminum-wrought alloy	60		10-15	10-15
	22		100		10-15	10-15
	23	Aluminum-cast, alloyed	75		15-20	15-20
	24		90		15-20	15-20
	27	Copper and Copper Alloys (Bronze / Brass)	90		8-12	8-12

SELECTION GUIDE

THREADING TOOLS

HSS-E NUT TAP

Nut Tapping Machines

HOLE TYPE			Max. 2.0xD Through Hole
TOOL MATERIAL			HSS-E
CHAMFER LEAD ACC. TO DIN2197			Long
FLUTE TYPE			Straight Flute
SPIRAL FLUTE ANGLE			-
SERIES	M	DIN371/376	
		DIN352	
		DIN357/LONG	TC803 (p.B327)
	MF	DIN374	
		DIN2181	
	UNC	DIN371/376	
		DIN351	
	UNF	DIN371/374	
		DIN2181	
	BSW	DIN2182/2183	
		DIN351	
	G(BSP)	DIN5156/5157	
	EG-M	DIN371/376	
	EG-UNC	DIN371/376	
	EG-UNF	DIN371/374	
SURFACE TREATMENT			Bright
MODEL			

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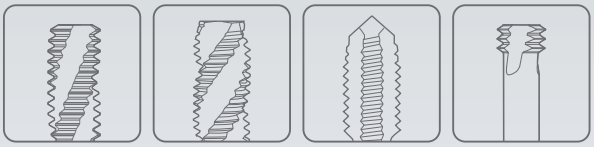
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		Vc (m/min.)
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	15-20
	2		About 0.45% C	Annealed	190	13	○	15-20
	3		About 0.45% C	Quenched & Tempered	250	25	○	12-18
	4		About 0.75% C	Annealed	270	28	○	10-15
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10	○	10-15
	7			Quenched & Tempered	275	29	○	10-15
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3	○	10-15
	18		Pearlitic		250	25	○	5-8
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130		○	10-15
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	25-35
	27		CuZn, CuSnZn (Brass)		90		○	8-12
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

Global Cutting Tool Leader **YG-1**



THREADING

YG CUTTING TOOLS

MILLING TOOLS

CBN END MILLS
i-Xmill END MILLS
i-SMART END MILLS
X1-EH SOLID CARBIDE END MILLS
X5070 NANO SOLID CARBIDE END MILLS
4G Mill SOLID CARBIDE END MILLS
X-POWER PRO SOLID CARBIDE END MILLS
TitaNox-POWER SOLID CARBIDE END MILLS
JET-POWER SOLID CARBIDE & HSS-PM END MILLS
V7 PLUS SOLID CARBIDE END MILLS
ALU-POWER HPC SOLID CARBIDE END MILLS
ALU-POWER SOLID CARBIDE & HSS-PM END MILLS
D-POWER GRAPHITE SOLID CARBIDE END MILLS (DIAMOND COATED)
CRX S SOLID CARBIDE END MILLS
K-2 SOLID CARBIDE END MILLS
ONLY ONE COATED PM60 END MILLS
TANK-POWER HSS-PM END MILLS
GENERAL HSS (8% Cobalt) END MILLS
HSS MILLING CUTTERS

YG-1 CO., LTD.

CONTENTS

CBN END MILLS

EXCHANGEABLE CARBIDE END MILLS

SOLID CARBIDE END MILLS

HSS END MILLS

YG-1 CO., LTD.

SELECTION GUIDE

YG MILLING TOOLS

		CBN		i-Xmill Insert			
	SERIES	ESB94	ESD02	XMB110A	XMB120C	XMB260T	XMB130A
	FLUTE	2	2	2	2	2	2
	HELIX ANGLE	30°	0°	-	-	-	-
	CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
	SIZE MIN	R0.2	D0.5	R4.0	R4.0	R4.0	R4.0
	SIZE MAX	R1.5	D2.0	R16.5	R16.0	R16.5	R16.5
	PAGE	C35	C36	C42	C42	C42	C43
	LENGTH	-	-	-	-	-	-
	SURFACE TREATMENT	Uncoated	Uncoated	AlTiN	XC-Coating	Z-Coating	AlTiN
				GENERAL PURPOSE	PRE-HARDENED STEELS	HIGH HARDENED STEELS	STAINLESS STEELS

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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125				◎			
	2		190	13			◎			
	3		250	25			◎			
	4		270	28			◎			
	5		300	32			◎			
	6	Low alloy steel	180	10			◎			
	7		275	29			◎			
	8		300	32			◎			
	9		350	38				◎		
	10	High alloyed steel, and tool steel	200	15				○		
	11		325	35				◎		
M	12	Stainless steel	200	15						◎
	13		240	23						◎
	14		180	10						◎
K	15	Grey cast iron	180	10				◎		
	16		260	26				◎		
	17	Nodular cast iron	160	3				◎		
	18		250	25				◎		
	19	Malleable cast iron	130					◎		
	20		230	21				◎		
N	21	Aluminum-wrought alloy	60							
	22		100							
	23	Aluminum-cast, alloyed	75							
	24		90							
	25		130							
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55	◎	◎		○	◎	
	39		630	60	◎	◎			◎	
	40	Chilled Cast Iron	400	42					○	
	41	Hardened Cast Iron	550	55	◎	◎			◎	

SELECTION GUIDE

YG MILLING TOOLS

i-Smart Modular Head

SERIES	XSEMD98	XSEME59	XSEME60	XSEME01	XSEME68	XSEME36	XSEME75
FLUTE	2	3	4	4	6	4	6
HELIX ANGLE	30°	30°	30°	27°/30° (MULTIPLE HELIX)	45°	27°/30° (MULTIPLE HELIX)	45°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE
SIZE MIN	R5.0	R5.0	R5.0	D10.0	D10.0	D10.0	D10.0
SIZE MAX	R16.0	R16.0	R16.0	D32.0	D32.0	D32.0	D32.0
PAGE	C64	C65	C66	C67	C69	C70	C71
LENGTH	-	CENTER MATCH	CENTER MATCH	-	-	-	-
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

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◎ : Excellent
○ : Good

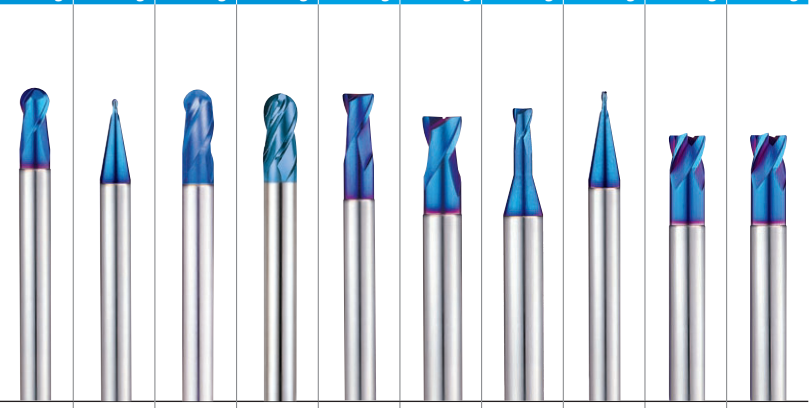
ISO	VDI 3323	Material Description	HB	HRc	XSEMD98	XSEME59	XSEME60	XSEME01	XSEME68	XSEME36	XSEME75
P	1	Non-alloy steel	125		○	○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○	○
	3		250	25	○	○	○	◎	○	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○	○
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15							
	13		240	23							
	14		180	10						○	
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60								
	22		100								
	23	Aluminum-cast, alloyed	75								
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.									
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55	○	○	○	○	○	○	○
	39		630	60	○	○	○	○	○	○	○
	40	Chilled Cast Iron	400	42	◎	◎	◎	◎	◎	◎	◎
	41	Hardened Cast Iron	550	55	○	○	○	○	○	○	○

SELECTION GUIDE

YG MILLING TOOLS

X5070

SERIES	G8A38	G8A53	G8A59	G8D62	G8A60	G8A36	G8A52	G8A50	G8A47	G8A37
FLUTE	2	2	3	4	2	2	2	2	4	4
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R0.5	R0.2	R1.5	R1.5	D0.5	D0.3	D0.5	D0.3	D3.0	D1.0
SIZE MAX	R12.5	R1.0	R10.0	R10.0	D12.0	D20.0	D2.0	D2.0	D12.0	D20.0
PAGE	C156	C157	C158	C159	C160	C165	C167	C168	C169	C170
LENGTH	EXTENDED NECK	MINIATURE	CENTER MATCH	CENTER MATCH	RIB PROCESSING	EXTENDED NECK	RIB PROCESSING	MINIATURE	EXTENDED NECK	EXTENDED NECK
SURFACE TREATMENT	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating



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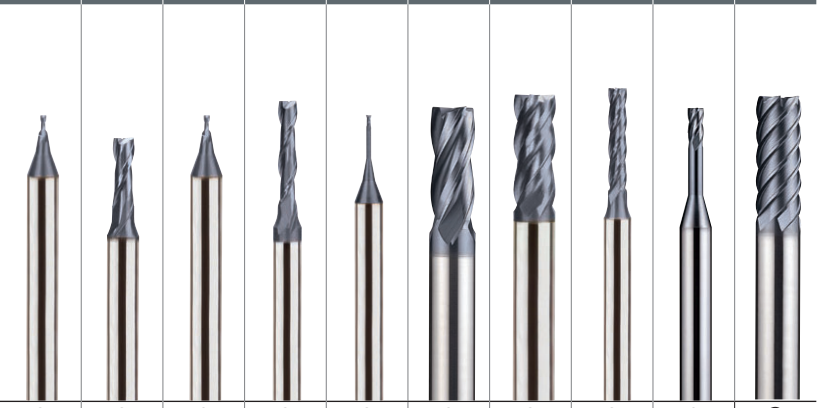
ISO	VDI 3323	Material Description	HB	HRc								
P	1	Non-alloy steel	125									
	2		190	13								
	3		250	25								
	4		270	28								
	5		300	32	○	○	○	○	○	○	○	○	○	○
	6	Low alloy steel	180	10								
	7		275	29								
	8		300	32	○	○	○	○	○	○	○	○	○	○
	9		350	38	○	○	○	○	○	○	○	○	○	○
	10	High alloyed steel, and tool steel	200	15								
	11		325	35	○	○	○	○	○	○	○	○	○	○
M	12	Stainless steel	200	15								
	13		240	23								
	14		180	10								
K	15	Grey cast iron	180	10								
	16		260	26								
	17	Nodular cast iron	160	3								
	18		250	25								
	19	Malleable cast iron	130									
	20		230	21								
N	21	Aluminum-wrought alloy	60									
	22		100									
	23	Aluminum-cast, alloyed	75									
	24		90									
	25		130									
	26	Copper and Copper Alloys (Bronze / Brass)	110									
	27		90									
	28		100									
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.										
	30											
S	31	Heat Resistant Super Alloys	200	15								
	32		280	30								
	33		250	25								
	34		350	38								
	35		320	34								
	36	Titanium Alloys	400 Rm									
	37		1050 Rm									
H	38	Hardened steel	550	55	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	39		630	60	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	40	Chilled Cast Iron	400	42	○	○	○	○	○	○	○	○	○	○
	41	Hardened Cast Iron	550	55	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

SELECTION GUIDE

YG MILLING TOOLS

4G Mill

SERIES	SEME35	SEME35	SEME35	SEME70	SEM845	SEME36	SEME71	SEME72	SEME73	SEME75
FLUTE	2	2	2	2	2	4	4	4	4	6
HELIX ANGLE	30°	30°	30°	30°	30°	27°/30° (MULTIPLE HELIX)	35°/38° (MULTIPLE HELIX)	30°	30°	45°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D0.1	D1.0	D0.1	D1.0	D0.1	D0.8	D1.0	D1.0	D1.0	D6.0
SIZE MAX	D25.0	D4.0	D3.0	D25.0	D12.0	D25.0	D20.0	D25.0	D12.0	D20.0
PAGE	C263	C266	C267	C268	C273	C281	C283	C286	C291	C296
LENGTH	-	4mm SHANK	3mm SHANK	LONG LENGTH	EXTENDED NECK	-	SHARP CORNER REMOVAL	LONG LENGTH	EXTENDED NECK	-
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



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○ : Good

ISO	VDI 3323	Material Description	HB	HRc								
P	1	Non-alloy steel	125		○	○	○	○	○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○	○	○	○	○
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○	○	○	○	○
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15					○				○	
	13		240	23					○				○	
	14		180	10	○	○	○		○	○	○		○	
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60											
	22		100											
	23	Aluminum-cast, alloyed	75											
	24		90											
	25		130											
	26	Copper and Copper Alloys (Bronze / Brass)	110											
	27		90											
	28		100											
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.												
	30													
S	31	Heat Resistant Super Alloys	200	15										
	32		280	30										
	33		250	25										
	34		350	38										
	35		320	34										
	36	Titanium Alloys	400 Rm											
	37		1050 Rm											
H	38	Hardened steel	550	55	○	○	○	○	○	○	○	○	○	○
	39		630	60										
	40	Chilled Cast Iron	400	42	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	41	Hardened Cast Iron	550	55	○	○	○	○	○	○	○	○	○	○

SELECTION GUIDE

YG MILLING TOOLS

	X-Power Pro					
SERIES	GM819	GM810	GM883	GM895	GM811	GM817
FLUTE	4	2	2	3	4	4
HELIX ANGLE	30°	30°	30°	38°	30°	30°
CUTTING EDGE SHAPE	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D3.0	D0.5	D0.4	D1.0	D2.0	D2.0
SIZE MAX	D20.0	D20.0	D6.0	D16.0	D25.0	D20.0
PAGE	C382	C383	C385	C388	C389	C390
LENGTH	LONG LENGTH	SHORT LENGTH	RIB PROCESSING	SHORT LENGTH	SHORT LENGTH	LONG LENGTH
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

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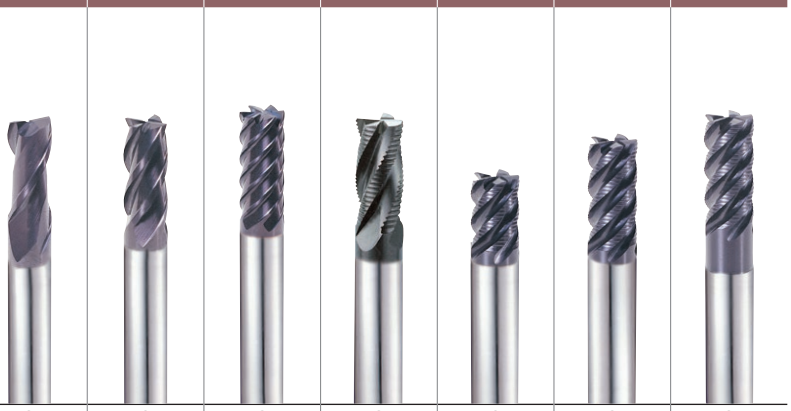
◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○
	3		250	25	○	○	○	○	○	○
	4		270	28	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○
	7		275	29	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	○	○		○	○	
	13		240	23	○	○		○	○	
	14		180	10	○	○		○	○	
K	15	Grey cast iron	180	10	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60							
	22		100							
	23	Aluminum-cast, alloyed	75							
	24		90							
	25		130							
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55	○	○	○	○	○	○
	39		630	60						
	40	Chilled Cast Iron	400	42	◎	◎	◎	◎	◎	◎
	41	Hardened Cast Iron	550	55	○	○	○	○	○	○

SELECTION GUIDE

YG MILLING TOOLS

	Jet-Power						
SERIES	EH911 EH912	EH913 EH914	EH915 EH916	EH831 EH841	EH917 EH918	EH919 EH920	EH921 EH942
FLUTE	2	4	6&8	Multi Flute	Multi Flute	Multi Flute	Multi Flute
HELIX ANGLE	35°	35°	45°	30°	45°	45°	45°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	ROUGHING	ROUGHING	ROUGHING	ROUGHING
SIZE MIN	D1.0	D2.0	D6.0	D6.0	D6.0	D4.0	D6.0
SIZE MAX	D25.0	D25.0	D25.0	D20.0	D16.0	D25.0	D20.0
PAGE	C442	C444	C446	C447	C448	C449	C450
LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH
SURFACE TREATMENT	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN



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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		○	○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○	○
	3		250	25	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○	○
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	○	○	○	○	○	○	○
	13		240	23	○	○	○	○	○	○	○
	14		180	10	◎	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10							
	16		260	26							
	17	Nodular cast iron	160	3							
	18		250	25							
	19	Malleable cast iron	130								
	20		230	21							
N	21	Aluminum-wrought alloy	60								
	22		100								
	23	Aluminum-cast, alloyed	75								
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.									
	30										
S	31	Heat Resistant Super Alloys	200	15			○	○	○	○	○
	32		280	30			○	○	○	○	○
	33		250	25			○	○	○	○	○
	34		350	38			○	○	○	○	○
	35		320	34			○	○	○	○	○
	36	Titanium Alloys	400 Rm		◎	◎	◎	◎	◎	◎	◎
	37		1050 Rm		◎	◎	◎	◎	◎	◎	◎
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42	○	○	○	○	○	○	○
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

YG MILLING TOOLS

	V7 Plus			Alu-Power HPC				
SERIES	GMG14 GMG15	GMH56 GMH57	EMB72 EMB73	E5H24 JAH24	E5H25 JAH25	E5H22 JAH22	E5H23 JAH23	E5I86 E5I87
FLUTE	6	6	5	3	3	3	3	3
HELIX ANGLE	45°	45°	41°~45°	37°	37°	37°	37°	37°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	CORNER RADIUS
SIZE MIN	D6.0	D6.0	D6.0	D6.0	D6.0	D3.0	D6.0	D6.0
SIZE MAX	D25.0	D25.0	D25.0	D20.0	D20.0	D25.0	D20.0	D20.0
PAGE	C479	C480	C481	C490	C493	C496	C497	C498
LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH	LONG LENGTH	-	EXTENDED NECK	-	EXTENDED NECK	-
SURFACE TREATMENT	Y-Coating	Y-Coating	AlTiN	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
		CHIP SPLITTER	V7 INOX	DLC	DLC	DLC	DLC	CHIP BREAKER

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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc								
P	1	Non-alloy steel	125		◎	◎	◎					
	2		190	13	◎	◎	◎					
	3		250	25	◎	◎	○					
	4		270	28	◎	◎	○					
	5		300	32	◎	◎	○					
	6	Low alloy steel	180	10	◎	◎	◎					
	7		275	29	◎	◎	○					
	8		300	32	◎	◎	○					
	9		350	38	◎	◎	○					
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎					
	11		325	35	◎	◎	○					
M	12	Stainless steel	200	15	◎	◎	◎					
	13		240	23	◎	◎	◎					
	14		180	10	◎	◎	◎					
K	15	Grey cast iron	180	10	◎	◎	○					
	16		260	26	◎	◎	○					
	17	Nodular cast iron	160	3	◎	◎	○					
	18		250	25	◎	◎	○					
	19	Malleable cast iron	130		◎	◎	○					
	20		230	21	◎	◎	○					
N	21	Aluminum-wrought alloy	60					◎	◎	◎	◎	◎
	22		100					◎	◎	◎	◎	◎
	23	Aluminum-cast, alloyed	75					◎	◎	◎	◎	◎
	24		90					◎	◎	◎	◎	◎
	25		130					○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110					○	○	○	○	○
	27		90					○	○	○	○	○
	28		100					○	○	○	○	○
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.						○	○	○	○	○
	30											
S	31	Heat Resistant Super Alloys	200	15	○	○	○					
	32		280	30	○	○	○					
	33		250	25	○	○	○					
	34		350	38	○	○	○					
	35		320	34	○	○	○					
	36	Titanium Alloys	400 Rm		○	○	◎					
	37		1050 Rm		○	○	◎					
H	38	Hardened steel	550	55								
	39		630	60								
	40	Chilled Cast Iron	400	42								
	41	Hardened Cast Iron	550	55								

SELECTION GUIDE

YG MILLING TOOLS

D-Power Graphite

SERIES	EI997	EIB93	EI880	EI451	EI450	EIB87	EI881
FLUTE	2	2	2	2	2	2	3
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R0.1	R0.2	R1.0	R1.0	R1.0	R0.5	R1.0
SIZE MAX	R3.0	R2.0	R6.0	R6.0	R6.0	R1.0	R5.0
PAGE	C526	C528	C529	C530	C531	C532	C533
LENGTH	MINIATURE NECK	MINIATURE NECK	SHORT LENGTH NECK	LONG LENGTH NECK	LONG REACH NECK	TAPER NECK	SHORT LENGTH NECK
SURFACE TREATMENT	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond

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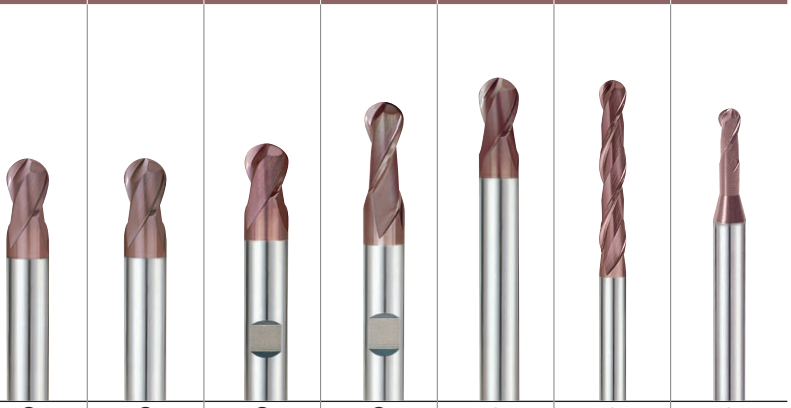
◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc	EI997	EIB93	EI880	EI451	EI450	EIB87	EI881
P	1	Non-alloy steel	125								
	2		190	13							
	3		250	25							
	4		270	28							
	5		300	32							
	6	Low alloy steel	180	10							
	7		275	29							
	8		300	32							
	9		350	38							
	10	High alloyed steel, and tool steel	200	15							
	11		325	35							
M	12	Stainless steel	200	15							
	13		240	23							
	14		180	10							
K	15	Grey cast iron	180	10							
	16		260	26							
	17	Nodular cast iron	160	3							
	18		250	25							
	19	Malleable cast iron	130								
	20		230	21							
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○
	22		100		○	○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○
	24		90		○	○	○	○	○	○	○
	25		130		○	○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.			◎	◎	◎	◎	◎	◎	◎
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42							
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

YG MILLING TOOLS

	K-2						
SERIES	G9624	G9A70	G9437	G9438	G9454	G9455	G9B81
FLUTE	2	2	2	2	2	2	2
HELIX ANGLE	30°	30°	≒30°	≒30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R1.0	R0.5	R1.0	R1.0	R1.5	R1.5	R0.2
SIZE MAX	R10.0	R10.0	R10.0	R10.0	R10.0	R10.0	R2.0
PAGE	C562	C563	C564	C565	C566	C567	C568
LENGTH	SHORT LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG REACH	EXTRA LONG LENGTH	RIB PROCESSING
SURFACE TREATMENT	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN



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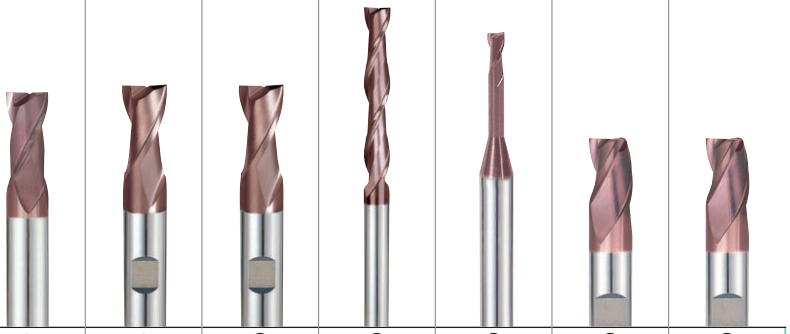
◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎
	11		325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	○	○	○	○	○	○	○
	13		240	23	○	○	○	○	○	○	○
	14		180	10	○	○	○	○	○	○	○
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○
	22		100		○	○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○
	24		90		○	○	○	○	○	○	○
	25		130		○	○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○
	27		90		○	○	○	○	○	○	○
	28		100		○	○	○	○	○	○	○
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.									
	30										
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○	○	○	
	32		280	30	○	○	○	○	○	○	
	33		250	25	○	○	○	○	○	○	
	34		350	38	○	○	○	○	○	○	
	35		320	34	○	○	○	○	○	○	
	36	Titanium Alloys	400 Rm		○	○	○	○	○	○	
	37		1050 Rm		○	○	○	○	○	○	
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42	○	○	○	○	○	○	
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

MILLING TOOLS

	K-2						
SERIES	G9527	G9445	G9G45	G9452	G9B80	G9410 G9553	G9G46
FLUTE	2	2	2	2	2	3	3
HELIX ANGLE	≈30°	≈30°	≈30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D3.5	D2.0	D3.0	D3.0	D0.4	D0.5	D3.0
SIZE MAX	D20.0	D20.0	D20.0	D20.0	D4.0	D20.0	D20.0
PAGE	C581	C582	C584	C585	C586	C589	C591
LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH WITH CHAMFER	EXTRA LONG LENGTH	RIB PROCESSING	THROW AWAY	THROW AWAY WITH CHAMFER
SURFACE TREATMENT	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
							

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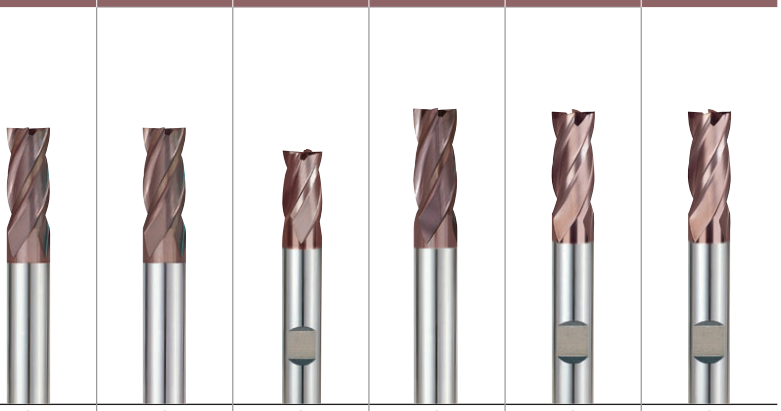
◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎
	11		325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	○	○	○	○	○	○	○
	13		240	23	○	○	○	○	○	○	○
	14		180	10	○	○	○	○	○	○	○
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○
	22		100		○	○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○
	24		90		○	○	○	○	○	○	○
	25		130		○	○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○
	27		90		○	○	○	○	○	○	○
	28		100		○	○	○	○	○	○	○
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.			○	○	○	○		○	○
	30										
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○		○	○
	32		280	30	○	○	○	○		○	○
	33		250	25	○	○	○	○		○	○
	34		350	38	○	○	○	○		○	○
	35		320	34	○	○	○	○		○	○
	36	Titanium Alloys	400 Rm		○	○	○	○		○	○
	37		1050 Rm		○	○	○	○		○	○
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42	○	○	○	○		○	○
	41	Hardened Cast Iron	550	55							

SELECTION GUIDE

YG MILLING TOOLS

	K-2					
SERIES	G9G50	G9A69	G9448	G9540	G9449	G9G51
FLUTE	4	4	4	4	4	4
HELIX ANGLE	30°	30°	≈ 30°	≈ 30°	≈ 30°	≈ 30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D3.0	D1.0	D2.0	D3.5	D2.0	D3.0
SIZE MAX	D20.0	D20.0	D20.0	D20.0	D20.0	D20.0
PAGE	C601	C602	C603	C604	C605	C606
LENGTH	SHORT LENGTH WITH CHAMFER	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH WITH CHAMFER
SURFACE TREATMENT	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
						

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎
	11		325	35	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	○	○	○	○	○	○
	13		240	23	○	○	○	○	○	○
	14		180	10	○	○	○	○	○	○
K	15	Grey cast iron	180	10	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○
	22		100		○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○
	24		90		○	○	○	○	○	○
	25		130		○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○
	27		90		○	○	○	○	○	○
	28		100		○	○	○	○	○	○
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.			○	○	○	○	○	○
	30									
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○	○	○
	32		280	30	○	○	○	○	○	○
	33		250	25	○	○	○	○	○	○
	34		350	38	○	○	○	○	○	○
	35		320	34	○	○	○	○	○	○
	36	Titanium Alloys	400 Rm		○	○	○	○	○	○
	37		1050 Rm		○	○	○	○	○	○
H	38	Hardened steel	550	55						
	39		630	60						
	40	Chilled Cast Iron	400	42	○	○	○	○	○	○
	41	Hardened Cast Iron	550	55						

SELECTION GUIDE

YG MILLING TOOLS

	Only One						Tank-Power	
SERIES	GYG52	GYG76 GYG02	GYF95	GYF94	GYF98	GYG03	E9940 GA940	E9A32 GAA32
FLUTE	4	4	Multi Flute	Multi Flute	Multi Flute	Multi Flute	2	2
HELIX ANGLE	35°/37°	30°	4F : 44°/45° 5F : 44°/44.5°/45°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	ROUGHING CORNER RADIUS	ROUGHING	ROUGHING	ROUGHING	BALL NOSE	BALL NOSE
SIZE MIN	D3.0	D2.0	D6.0	D6.0	D6.0	D6.0	R0.5	R1.0
SIZE MAX	D25.0	D25.0	D25.0	D25.0	D25.0	D25.0	R12.5	R12.5
PAGE	C638	C639	C640	C641	C642	C643	C656	C657
LENGTH	SHORT LENGTH CENTER CUT	LONG LENGTH CENTER CUT	SHORT LENGTH CENTER CUT	SHORT LENGTH CENTER CUT	LONG LENGTH CENTER CUT	SHORT LENGTH CENTER CUT	SHORT LENGTH	LONG LENGTH
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	TiAlN	TiAlN
	PM60	PM60	PM60	PM60	PM60	PM60	HSS-PM	HSS-PM

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎	◎
	9		350	38	○	○	○	○	○	○	○	○
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎
	11		325	35	○	○	○	○	○	○	○	○
M	12	Stainless steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎
	13		240	23	◎	◎	◎	◎	◎	◎	◎	◎
	14		180	10	◎	◎	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎	◎	◎
	16		260	26	◎	◎	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130		◎	◎	◎	◎	◎	◎	◎	◎
	20		230	21	◎	◎	◎	◎	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	60									
	22		100									
	23	Aluminum-cast, alloyed	75									
	24		90									
	25		130									
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○	○
	27		90		○	○	○	○	○	○	○	○
	28		100		○	○	○	○	○	○	○	○
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.										
	30											
S	31	Heat Resistant Super Alloys	200	15								
	32		280	30								
	33		250	25								
	34		350	38								
	35		320	34								
	36	Titanium Alloys	400 Rm									
	37		1050 Rm									
H	38	Hardened steel	550	55								
	39		630	60								
	40	Chilled Cast Iron	400	42	○	○	○	○	○	○		
	41	Hardened Cast Iron	550	55								

SELECTION GUIDE

YG MILLING TOOLS

General HSS End mills

SERIES	E2535 EQ535	E2492 EQ492	EL612	E2570 EQ570	E2571 EQ571	E2510 EQ510	E2464	E2509
FLUTE	2	2	1	2	2	2	2	2
HELIX ANGLE	≒ 30°	≒ 30°	≒ 30°	≒ 30°	≒ 30°	30°	42°	42°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	R1.0	R1.0	D3.0	D1.0	D1.5	D3.0	D1.5	D2.0
SIZE MAX	R16.0	R15.0	D10.0	D40.0	D32.0	D40.0	D30.0	D20.0
PAGE	C689	C690	C691	C692	C695	C697	C698	C700
LENGTH	SHORT LENGTH	LONG LENGTH	-	SHORT LENGTH	LONG LENGTH	EXTRA LONG LENGTH	SHORT LENGTH	LONG LENGTH
SURFACE TREATMENT	Uncoated / TiAlN	Uncoated / TiAlN	Uncoated	Uncoated / TiAlN	Uncoated / TiAlN	Uncoated / TiAlN	Uncoated	Uncoated
	HSS Co8	HSS Co8	HSS-E	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc	E2535 EQ535	E2492 EQ492	EL612	E2570 EQ570	E2571 EQ571	E2510 EQ510	E2464	E2509
P	1	Non-alloy steel	125		◎	◎	○	◎	◎	◎	○	○
	2		190	13	◎	◎	○	◎	◎	◎	○	○
	3		250	25	◎	◎		◎	◎	◎		
	4		270	28	◎	◎		◎	◎	◎		
	5		300	32	○	○		○	○	○		
	6	Low alloy steel	180	10	◎	◎	○	◎	◎	◎	○	○
	7		275	29	◎	◎		◎	◎	◎		
	8		300	32	○	○		○	○	○		
	9		350	38	○	○		○	○	○		
	10	High alloyed steel, and tool steel	200	15	◎	◎	○	◎	◎	◎	○	○
	11		325	35	○	○		○	○	○		
M	12	Stainless steel	200	15								
	13		240	23								
	14		180	10								
K	15	Grey cast iron	180	10								
	16		260	26								
	17	Nodular cast iron	160	3								
	18		250	25								
	19	Malleable cast iron	130									
	20		230	21								
N	21	Aluminum-wrought alloy	60		○	○	◎	○	○	○	◎	◎
	22		100		○	○	◎	○	○	○	◎	◎
	23	Aluminum-cast, alloyed	75		○	○	◎	○	○	○	◎	◎
	24		90		○	○	◎	○	○	○	◎	◎
	25		130		○	○	○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110									
	27		90									
	28		100									
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.										
	30											
S	31	Heat Resistant Super Alloys	200	15								
	32		280	30								
	33		250	25								
	34		350	38								
	35		320	34								
	36	Titanium Alloys	400 Rm									
	37		1050 Rm									
H	38	Hardened steel	550	55								
	39		630	60								
	40	Chilled Cast Iron	400	42								
	41	Hardened Cast Iron	550	55								

SELECTION GUIDE

YG MILLING TOOLS

Milling Cutters

SERIES	ML012, ML022 ML112, ML122	ML032, ML042 ML132, ML142	ML062, ML162	ML072, ML172	ML092	ML102
FLUTE	Multi Flute	Multi Flute	Multi Flute	Multi Flute	Multi Flute	Multi Flute
HELIX ANGLE	0°	0°	10°~12°	10°~20°	-	-
CUTTING EDGE SHAPE	DOVETAIL CUTTERS	DOVETAIL CUTTERS	WOODRUFF KEYSEAT CUTTERS	T-SLOT CUTTERS	SIDE AND FACE MILLING CUTTERS	SIDE AND FACE MILLING CUTTERS
SIZE MIN	D16.0	D16.0	D10.5	D12.5	D50.0	D50.0
SIZE MAX	D50.0	D38.0	D45.5	D40.0	D125.0	D200.0
PAGE	C752	C753	C754	C756	C757	C758
LENGTH	Type A, C, E	Type B, D, F	Type B, D, F	Type AA, AB, AD	with STRAIGHT TEETH	with STAGGERED TEETH
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎
	9		350	38	○	○	○		○	○
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎
	11		325	35	○	○	○		○	○
M	12	Stainless steel	200	15						
	13		240	23						
	14		180	10						
K	15	Grey cast iron	180	10						
	16		260	26						
	17	Nodular cast iron	160	3						
	18		250	25						
	19	Malleable cast iron	130							
	20		230	21						
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○
	22		100		○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○
	24		90		○	○	○	○	○	○
	25		130		○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials Duroplastic, Fiber Reinforced Plastic, Graphite, CFRP, GFRP, etc.								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55						
	39		630	60						
	40	Chilled Cast Iron	400	42						
	41	Hardened Cast Iron	550	55						

Global Cutting Tool Leader **YG-1**

MILLING

Leading Through Innovation

CBN (Cubic Boron Nitride)

CBN FRÄSER

- CBN(Cubic Boron Nitride) Machining High Hardened Steels up to HRc70 Mirror Finish
- CBN (Kubisches Bornitrid) zur Bearbeitung von hochgehärteten Stählen bis HRc70 Hochglanzoberfläche

SELECTION GUIDE

YG MILLING TOOLS

SERIES	ESB94	ESD02
FLUTE	2	2
HELIX ANGLE	30°	0°
CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS
SIZE MIN	R0.2	D0.5
SIZE MAX	R1.5	D2.0
PAGE	C35	C36
	-	-
	Uncoated	Uncoated

CBN END MILLS

Cubic Boron Nitride,
Machining High Hardened Steels
up to HRc70, Mirror Finish

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C37

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125			
	2		About 0.45% C	Annealed	190	13		
	3		About 0.45% C	Quenched & Tempered	250	25		
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10		
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55	◎	◎
	39			Hardened	630	60	◎	◎
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55	◎	◎

CBN END MILLS

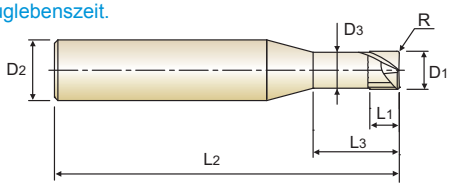
PLAIN SHANK **ESD02** SERIES

CBN, 2 FLUTE CORNER RADIUS

CBN, 2 SCHNEIDEN ECKENRADIUS
CBN, fraise 2 dents, torique
CBN, 2 TAGLIENTI, TORICA

- ▶Achieves stable machining and higher accuracy for duration.
- ▶Saves setting time and cost from the reduction of frequent tool change.
- ▶Improves repeatability in performance.
- ▶Special designed geometry improving tool rigidity at High Speed Cutting.
- ▶Tighter Radius Tolerance of ±0.005mm and higher accuracy with longer tool life.

- ▶ Sichert dauerhaft stabile Bearbeitung und höhere Genauigkeit.
- ▶ Spart Rüstzeit und -kosten durch weniger Werkzeugwechsel.
- ▶ Verbessert die Wiederholgenauigkeit.
- ▶ Eine besondere Werkzeuggeometrie verbessert die Steifigkeit bei HSC-Bearbeitung.
- ▶ Engere Radiustoleranz ±0.005, höhere Genauigkeit und längere Werkzeuglebenszeit.



p. C37

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.005)	D1	D2	L1	L3	L2	D3
ESD02005052	R0.05	**0.5**	4	0.3	2	50	0.46
ESD02005053	R0.05	**0.5**	4	0.3	3	50	0.46
ESD02010053	R0.05	**1.0**	4	0.7	3	50	0.95
ESD02010055	R0.05	**1.0**	4	0.7	5	50	0.95
ESD02010103	R0.1	**1.0**	4	0.7	3	50	0.95
ESD02015105	R0.1	**1.5**	4	1.0	5	50	1.45
ESD02015108	R0.1	**1.5**	4	1.0	8	50	1.45
ESD02015208	R0.2	**1.5**	4	1.0	8	50	1.45
ESD02020106	R0.1	**2.0**	4	1.2	6	50	1.95
ESD02020100	R0.1	**2.0**	4	1.2	10	50	1.95
ESD02020200	R0.2	**2.0**	4	1.2	10	50	1.95

Corner Radius(mm)	Shank Dia. Tolerance
± 0.005	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎		◎

Global Cutting Tool Leader **YG-1**

MILLING

YG

Leading Through Innovation

CARBIDE INSERT & HOLDER

i-Xmill END MILLS

i-Xmills, HM-Wendeplatten Fräser

- **Various Applications Type of Inserts Available for General Purpose Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steels and Graphite**
- **Für die verschiedensten Anwendungen sind Wendeplatten verfügbar, für allgemeine Stähle, vorgehärtete Stähle, hochgehärtete Stähle, rostfreie Stähle und Graphit**

SELECTION GUIDE

YG MILLING TOOLS

CARBIDE INSERT & HOLDER i-Xmill END MILLS

Available for General Purpose Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steel and Graphite

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C56

SERIES	XMB110A	XMB120C	XMB260T	XMB130A
FLUTE	2	2	2	2
HELIX ANGLE	-	-	-	-
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R4.0	R4.0	R4.0	R4.0
SIZE MAX	R16.5	R16.5	R16.5	R16.5
PAGE	C42	C42	C42	C43
	-	-	-	-
	AlTiN	XC-Coating	Z-Coating	AlTiN
	GENERAL PURPOSE	PRE-HARDENED STEELS	HIGH HARDENED STEELS	STAINLESS STEELS

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎			
	2		About 0.45% C	Annealed	190	13	◎			
	3		About 0.45% C	Quenched & Tempered	250	25	◎			
	4		About 0.75% C	Annealed	270	28	◎			
	5		About 0.75% C	Quenched & Tempered	300	32	◎			
	6	Low alloy steel		Annealed	180	10	◎			
	7			Quenched & Tempered	275	29	◎			
	8			Quenched & Tempered	300	32	◎			
	9			Quenched & Tempered	350	38		◎		
	10	High alloyed steel, and tool steel		Annealed	200	15		○		
	11			Quenched & Tempered	325	35		◎		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				◎
	13		Martensitic	Quenched & Tempered	240	23				◎
	14		Austenitic		180	10				◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10		◎		
	16		Pearlitic (Martensitic)		260	26		◎		
	17	Nodular cast iron	Ferritic		160	3		◎		
	18		Pearlitic		250	25		◎		
	19	Malleable cast iron	Ferritic		130			◎		
	20		Pearlitic		230	21		◎		
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55		○	◎	
	39			Hardened	630	60			◎	
	40	Chilled Cast Iron		Cast	400	42			○	
	41	Hardened Cast Iron		Hardened	550	55			◎	

i-Xmill END MILLS

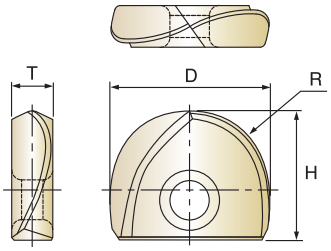
XMB110A SERIES
XMB120C SERIES
XMB260T SERIES

i-Xmill BALL INSERTS

i-Xmill WECHSELPLATTE mit RUNDER STIRN
i-Xmill - Plaquette hémisphérique
i-Xmill Placca emisferica

- ▶Exchangeable Ball End Mill for economic use
- ▶Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite
- ▶Special Geometry and Coating for Excellent Performance

- ▶ Kopierfräser mit Wechselplatte für wirtschaftlichen Einsatz.
- ▶ Drei Typen von Schneideinsätzen lieferbar
  - Für allgemeinen Einsatz (HRc50)
  - Für gehärtete Materialien (HRc40~HRc65)
  - Für graphit
- ▶ Spezielle Geometrie und Beschichtung für höchste Leistu



cutting conditions : p.C56

Unit : mm

EDP No.			Radius of Ball Nose	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
General Purpose	Pre-Hardened Steels	High Hardened Steels	R	D	H	T
XMB110A080	**XMB120C080**	**XMB260T080**	R4.0	**8.0**	8.0	2.4
XMB110A100	**XMB120C100**	**XMB260T100**	R5.0	**10.0**	9.5	2.7
XMB110A110	**XMB120C110**	-	R5.5	**11.0**	10.0	2.7
XMB110A120	**XMB120C120**	**XMB260T120**	R6.0	**12.0**	11.0	3.2
XMB110A130	**XMB120C130**	**XMB260T130**	R6.5	**13.0**	11.5	3.2
XMB110A160	**XMB120C160**	**XMB260T160**	R8.0	**16.0**	13.0	4.2
XMB110A170	**XMB120C170**	-	R8.5	**17.0**	13.5	4.2
XMB110A200	**XMB120C200**	**XMB260T200**	R10.0	**20.0**	16.0	5.2
XMB110A210	-	**XMB260T210**	R10.5	**21.0**	16.5	5.2
XMB110A250	**XMB120C250**	**XMB260T250**	R12.5	**25.0**	19.5	6.2
XMB110A260	**XMB120C260**	**XMB260T260**	R13.0	**26.0**	20.0	6.2
XMB110A300	**XMB120C300**	**XMB260T300**	R15.0	**30.0**	23.5	7.2
XMB110A320	**XMB120C320**	**XMB260T320**	R16.0	**32.0**	24.5	7.2
XMB110A330	-	**XMB260T330**	R16.5	**33.0**	25.0	7.2

▶ The ball radius tolerance is ±0.01mm and the set-up accuracy is ±0.02mm.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XMB110A	◎	◎	◎	◎	◎	◎	◎	◎												
XMB120C									◎	○	◎				◎	◎	◎	◎	◎	◎
XMB260T																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
XMB110A																					
XMB120C																		○			
XMB260T																		◎	◎	○	◎

i-Xmill END MILLS

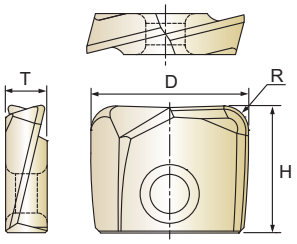
XMR110A SERIES
XMR120C SERIES
XMR260T SERIES

i-Xmill CORNER RADIUS INSERT

i-Xmill WECHSELPLATTE mit GERADER STIRN UND ECKRADIUS
i-Xmill - Plaquette pour usage général et inox
INSERTI IN MD, TORICI

- The optimized geometry of the tool achieves better reliability and less vibration and cutting load.
- Interchangeable with i-Xmill ball holder, but precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- The varied and wide cutting range makes it possible to machine from roughing through to finishing.
- Special coating makes high hardness with high thermal stability against oxidation.

- Die optimale Werkzeuggeometrie für große Betriebssicherheit und geringe Vibration und Schneidendruck.
- Einsetzbar wie i-Xmill Rundplattenhalter, aber eine größere Schnittgenauigkeit ist mit dem Vierkantplattenhalter möglich, wegen der größeren Steifigkeit und Stärke des Werkzeugs.
- Die große Einsatzbreite des Werkzeugs macht den Einsatz sowohl zum Schruppen als auch zum Schlichten möglich.
- Eine spezielle Beschichtung verleiht der Schneide große Härte und Hitzebeständigkeit.



cutting conditions : p.C58

Unit : mm

EDP No.			Corner Radius	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
General Purpose & Stainless Steels	Pre-Hardened Steels	High Hardened Steels	R	D	H	T
-	XMR120C080 03	XMR260T080 03	R0.3	8.0	8.0	2.4
-	XMR120C080 05	XMR260T080 05	R0.5	8.0	8.0	2.4
XMR110A080 10	XMR120C080 10	XMR260T080 10	R1.0	8.0	8.0	2.4
-	XMR120C080 20	XMR260T080 20	R2.0	8.0	8.0	2.4
XMR110A100 03	XMR120C100 03	XMR260T100 03	R0.3	10.0	9.5	2.7
XMR110A100 05	XMR120C100 05	XMR260T100 05	R0.5	10.0	9.5	2.7
XMR110A100 10	XMR120C100 10	XMR260T100 10	R1.0	10.0	9.5	2.7
XMR110A100 15	XMR120C100 15	XMR260T100 15	R1.5	10.0	9.5	2.7
XMR110A100 20	XMR120C100 20	XMR260T100 20	R2.0	10.0	9.5	2.7
XMR110A100 30	-	XMR260T100 30	R3.0	10.0	9.5	2.7
-	-	XMR260T110 03	R0.3	11.0	9.5	2.7
XMR110A110 05	XMR120C110 05	XMR260T110 05	R0.5	11.0	9.5	2.7
-	XMR120C110 10	XMR260T110 10	R1.0	11.0	9.5	2.7
XMR110A110 20	XMR120C110 20	XMR260T110 20	R2.0	11.0	9.5	2.7
XMR110A110 30	-	-	R3.0	11.0	9.5	2.7
XMR110A120 03	XMR120C120 03	XMR260T120 03	R0.3	12.0	11.0	3.2
XMR110A120 05	XMR120C120 05	XMR260T120 05	R0.5	12.0	11.0	3.2
XMR110A120 10	XMR120C120 10	XMR260T120 10	R1.0	12.0	11.0	3.2

▶ The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XMR110A	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎						
XMR120C									◎	○	◎				◎	◎	◎	◎	◎	◎
XMR260T																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
XMR110A																					
XMR120C																		○			
XMR260T																		◎	◎	○	◎

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i-Xmill END MILLS

XMR110A SERIES
XMR120C SERIES
XMR260T SERIES

i-Xmill CORNER RADIUS INSERT

i-Xmill WECHSELPLATTE mit GERADER STIRN UND ECKRADIUS
i-Xmill - Plaquette pour usage général et inox
INSERTI IN MD, TORICI

- The optimized geometry of the tool achieves better reliability and less vibration and cutting load.
- Interchangeable with i-Xmill ball holder, but precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
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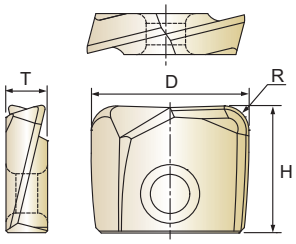
- Special coating makes high hardness with high thermal stability against oxidation.

- Die optimale Werkzeuggeometrie für große Betriebssicherheit und geringe Vibration und Schneidendruck.
- Einsetzbar wie i-Xmill Rundplattenhalter, aber eine größere Schnittgenauigkeit ist mit dem Vierkantplattenhalter möglich, wegen der größeren Steifigkeit und Stärke des Werkzeugs.
- Die große Einsatzbreite des Werkzeugs macht den Einsatz sowohl zum Schruppen als auch zum Schlichten möglich.
- Eine spezielle Beschichtung verleiht der Schneide große Härte und Hitzebeständigkeit.



cutting conditions : p.C58

Unit : mm

EDP No.			Corner Radius	Mill Diameter	Height	Thickness
AlTiN	XC-Coating	Z-Coating				
General Purpose & Stainless Steels	Pre-Hardened Steels	High Hardened Steels	R	D	H	T
-	XMR120C200 03	XMR260T200 03	R0.3	20.0	16.0	5.2
XMR110A200 05	XMR120C200 05	XMR260T200 05	R0.5	20.0	16.0	5.2
XMR110A200 10	XMR120C200 10	XMR260T200 10	R1.0	20.0	16.0	5.2
XMR110A200 15	XMR120C200 15	-	R1.5	20.0	16.0	5.2
XMR110A200 20	XMR120C200 20	XMR260T200 20	R2.0	20.0	16.0	5.2
XMR110A200 30	XMR120C200 30	-	R3.0	20.0	16.0	5.2
XMR110A210 03	XMR120C210 03	XMR260T210 03	R0.3	21.0	16.0	5.2
XMR110A210 05	XMR120C210 05	-	R0.5	21.0	16.0	5.2
XMR110A210 10	XMR120C210 10	XMR260T210 10	R1.0	21.0	16.0	5.2
XMR110A210 20	XMR120C210 20	XMR260T210 20	R2.0	21.0	16.0	5.2
-	XMR120C250 03	XMR260T250 03	R0.3	25.0	19.5	6.2
XMR110A250 05	XMR120C250 05	XMR260T250 05	R0.5	25.0	19.5	6.2
XMR110A250 10	XMR120C250 10	XMR260T250 10	R1.0	25.0	19.5	6.2
-	XMR120C250 15	XMR260T250 15	R1.5	25.0	19.5	6.2
XMR110A250 20	XMR120C250 20	XMR260T250 20	R2.0	25.0	19.5	6.2
-	XMR120C250 30	XMR260T250 30	R3.0	25.0	19.5	6.2
-	XMR120C260 03	-	R0.3	26.0	19.5	6.2
XMR110A260 05	-	XMR260T260 05	R0.5	26.0	19.5	6.2

▶ The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XMR110A	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎						
XMR120C									◎	○	◎				◎	◎	◎	◎	◎	◎
XMR260T																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
XMR110A																					
XMR120C																		○			
XMR260T																		◎	◎	○	◎

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YG i-Xmill END MILLS

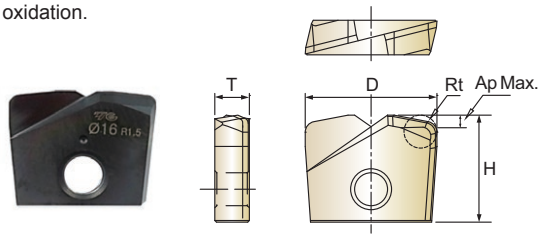
XMF110V SERIES
XMR110D SERIES

i-Xmill CORNER RADIUS INSERT

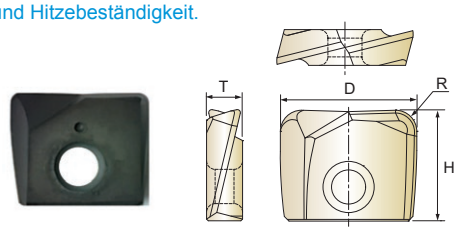
i-Xmill WECHSELPLATTE mit GERADER STIRN UND ECKRADIUS
i-Xmill Plaquette Torique AVEC RAYON de coupe frontale
INSERTI IN MD, TORICI & TORICI HIGH FEED

- The optimized geometry of the tool achieves better reliability and less vibration and cutting load.
- Interchangeable with i-Xmill ball holder, but precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- The varied and wide cutting range makes it possible to machine from roughing through to finishing.
- Special coating makes high hardness with high thermal stability against oxidation.

- Die optimale Werkzeuggeometrie für große Betriebssicherheit und geringe Vibration und Schneidendruck.
- Einsetzbar wie i-Xmill Rundplattenhalter, aber eine größere Schnittgenauigkeit ist mit dem Vierkantplattenhalter möglich, wegen der größeren Steifigkeit und Stärke des Werkzeugs.
- Die große Einsatzbreite des Werkzeugs macht den Einsatz sowohl zum Schruppen als auch zum Schlichten möglich.
- Eine spezielle Beschichtung verleiht der Schneide große Härte und Hitzebeständigkeit.



High Feed



cutting conditions : p.C59

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Height	Thickness	for High Feed
Y-Coating	Diamond					
General Purpose High Feed	Graphite	R(Rt)	D	H	T	Ap Max.
-	XMR110D080 05	R0.5	8.0	8.0	2.4	-
XMF110V080 08	-	R0.8	8.0	8.0	2.4	0.4
-	XMR110D080 10	R1.0	8.0	8.0	2.4	-
XMF110V100 10	XMR110D100 10	R1.0	10.0	9.5	2.7	0.5
XMF110V110 10	-	R1.0	11.0	9.5	2.7	0.5
-	XMR110D120 05	R0.5	12.0	11.0	2.7	-
XMF110V120 10	-	R1.0	12.0	11.0	2.7	0.6
-	XMR110D120 20	R2.0	12.0	11.0	2.7	-
-	XMR110D130 03	R0.3	13.0	11.2	2.7	-
XMF110V130 10	-	R1.0	13.0	11.2	2.7	0.6
-	XMR110D160 05	R0.5	16.0	13.0	4.2	-
-	XMR110D160 10	R1.0	16.0	13.0	4.2	-
XMF110V160 15	-	R1.5	16.0	13.0	4.2	0.8

- The corner radius tolerance is ±0.015mm(Rt tolerance is ±0.05mm) and the set-up accuracy is ±0.02mm.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XMF110V	◎	◎	◎	◎	◎	◎	◎			◎										
XMR110D																				

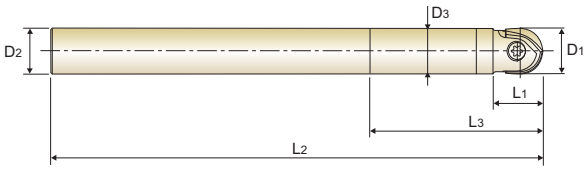
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
XMF110V																					
XMR110D	○	○	○	○					◎												

i-Xmill END MILLS

ZBC SERIES

i-Xmill CARBIDE BALL HOLDER - STRAIGHT NECK

i-Xmill HARTMETAL HALTER für WECHSEL PLATTE mit RUNDER STIRN - mit GERADER SCHAFT
Porte-plaquette i-Xmill en Carbure, entrée droite, pour plaquette à bout hémisphérique
CORPO FRESA IN MD PER INSERTI SEMISFERICI i-Xmill - CILINDRICO



Unit : mm

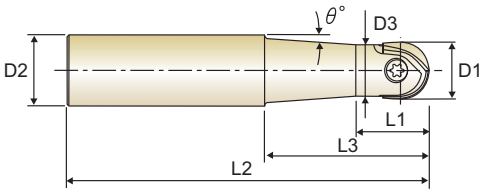
EDP No.	Mill Diameter D1	Shank Diameter D2	Neck Diameter D3	Length of Cut L1	Length Below Shank L3	Overall Length L2	Length Type	Wrench No.	Screw No.
★ ZBC0801080	8	8	7.6	12	25	130	Regular	TWFT07	TX2508T07
★ ZBC0802080	8	8	7.6	12	40	130	Regular		
★ ZBC0803080	8	8	7.6	12	65	130	Regular		
ZBC0804080	8	8	7.6	12	60	150	Regular		
ZBC0805080	8	8	7.6	12	60	200	Long		
ZBC0806080	8	8	7.6	12	25	80	Short		
★ ZBC1001100	10, 11	10	9.5	15	30	140	Regular	TWFT08	TX3010T08
★ ZBC1002100	10, 11	10	9.5	15	50	140	Regular		
★ ZBC1003100	10, 11	10	9.5	15	75	140	Regular		
ZBC1004100	10, 11	10	9.5	15	60	180	Regular		
ZBC1005100	10, 11	10	9.5	15	60	200	Long		
ZBC1006100	10, 11	10	9.5	15	30	80	Short		
ZBC120001P	12, 13	12	11.4	17	40	200	Long	TWFT10	TX3512T10
★ ZBC1201120	12, 13	12	11.4	17	35	150	Regular		
★ ZBC1202120	12, 13	12	11.4	17	60	150	Regular		
★ ZBC1203120	12, 13	12	11.4	17	85	150	Regular		
ZBC1204120	12, 13	12	11.4	17	60	250	Long		
ZBC1205120	12, 13	12	11.4	17	35	100	Short		
ZBC160001P	16, 17	16	15.0	20	50	150	Regular	TWFT15	TX4016T15
★ ZBC1601160	16, 17	16	15.0	20	50	200	Long		
★ ZBC1602160	16, 17	16	15.0	20	80	200	Long		
★ ZBC1603160	16, 17	16	15.0	20	120	200	Long		
★ ZBC1604160	16, 17	16	15.0	20	80	250	Long		
ZBC1605160	16, 17	16	15.0	20	50	120	Short		
ZBC200002P	20, 21	20	19.0	25	60	150	Regular	● TWBT20	TX5020T20
★ ZBC2001200	20, 21	20	19.0	25	60	200	Regular		
★ ZBC2002200	20, 21	20	19.0	25	80	200	Regular		
★ ZBC2003200	20, 21	20	19.0	25	100	250	Long		
★ ZBC2004200	20, 21	20	19.0	25	150	250	Long		
ZBC2005200	20, 21	20	19.0	25	100	300	Long		
ZBC250001P	25, 26	25	24.0	30	75	150	Regular	● TWBT25	TX6025T25
★ ZBC2501250	25, 26	25	24.0	30	75	200	Regular		
★ ZBC2502250	25, 26	25	24.0	30	120	250	Regular		
★ ZBC2503250	25, 26	25	24.0	30	190	300	Long		
ZBC2504250	25, 26	25	24.0	30	120	350	Long		
ZBC2505250	25, 26	25	24.0	30	60	300	Long		
★ ZBC3001320	30, 32, 33	32	29.0	40	90	250	Regular	● TWBT30	TX8030T30
ZBC3004320	30, 32, 33	32	29.0	40	120	350	Long		
ZBC3005320	30, 32, 33	32	29.0	40	150	400	Long		

● : Required to use T-HANDLE (TWH600)
★ : Stock Item

▶ Upon request, the broken holder is able to be regenerated.
▶ Your carbide holder can be regenerated as YG-1 type upon request.

i-Xmill STEEL BALL HOLDER - TAPER NECK

i-Xmill STAHL HALTER für WECHSEL PLATTE mit RUNDER STIRN - mit KONISCH ABGESETZTEM SCHAFTTEIL
Porte-plaquette i-Xmill en acier, entrée conique, pour plaquette à bout hémisphérique
CORPO FRESA IN ACCIAIO PER INSERTI SEMISFERICI i-Xmill - CONICO



Unit : mm

EDP No.	Mill Diameter D_1	Shank Diameter D_2	Neck Diameter D_3	Length of Cut L_1	Length Below Shank L_3	Overall Length L_2	Interference Angle θ°	Length Type	Wrench No.	Screw No.
★ ZBT0801120	8	12	7.2	12	35	90	4° 43′	Short	TWFT07	TX2508T07
★ ZBT0802120	8	12	7.2	25	55	110	3° 37′	Regular		
★ ZBT1001120	10, 11	12	9.0	15	35	90	2° 51′	Short	TWFT08	TX3010T08
★ ZBT1002120	10, 11	12	9.0	30	55	110	2° 17′	Regular		
★ ZBT1201160	12, 13	16	10.5	17	55	110	3° 23′	Short	TWFT10	TX3512T10
★ ZBT1601200	16, 17	20	14.5	20	65	125	2° 51′	Short	TWFT15	TX4016T15
ZBT1604200	16, 17	20	14.5	20	115	200	1° 22′	Regular		
★ ZBT2001250	20, 21	25	18.0	25	75	145	3° 26′	Short	●TWBT20	TX5020T20
ZBT2004250	20, 21	25	18.0	25	115	200	1° 55′	Regular		
ZBT2005250	20, 21	25	18.0	25	160	250	1° 17′	Long		
ZBT2504320	25, 26	32	22.5	30	160	250	1° 53′	Regular	●TWBT25	TX6025T25
ZBT2505320	25, 26	32	22.5	30	190	300	1° 32′	Long		
★ ZBT3001320	30,32,33	32	27.0	40	110	195	1° 38′	Short	●TWBT30	TX8030T30
ZBT3004320	30,32,33	32	27.0	40	160	250	0° 58′	Regular		

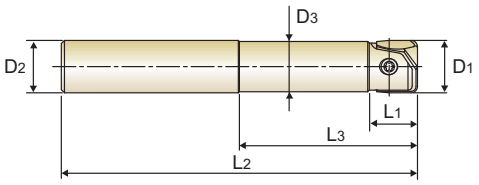
● : Required to use T-HANDLE (TWH600)
★ : Stock Item

i-Xmill END MILLS

ZRS SERIES

i-Xmill STEEL CORNER RADIUS HOLDER - STRAIGHT NECK

i-Xmill STAHL HALTER für WECHSEL PLATTE mit ECKRADIUS - mit GERADER SCHAFT
Porte-plaquette i-Xmill en acier, entrée droite, pour plaquette torique
CORPO FRESA IN ACCIAIO PER INSERTI TORICI i-Xmill - CILINDRICO



Unit : mm

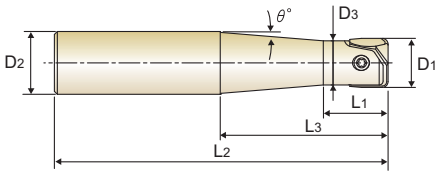
EDP No.	Mill Diameter	Shank Diameter	Neck Diameter	Length of Cut	Length Below Shank	Overall Length	Length Type	Wrench No.	Screw No.
	D1	D2	D3	L1	L3	L2			
★ ZRS1201120	12, 13	12	11.0	13	30	110	Regular	TWFT10	TX3512T10
★ ZRS1601160	16, 17	16	15.0	15	50	130	Regular	TWFT15	TX4016T15
ZRS1603160	16, 17	16	15.0	15	65	200	Long		
★ ZRS2001200	20, 21	20	19.0	18	60	140	Regular	●TWBT20	TX5020T20
★ ZRS2002200	20, 21	20	19.0	18	80	180	Intermediate		
ZRS2003200	20, 21	20	19.0	18	80	250	Long		
★ ZRS2501250	25, 26	25	24.0	23	70	150	Regular	●TWBT25	TX6025T25
ZRS2503250	25, 26	25	24.0	23	90	300	Long		
★ ZRS3001320	30, 32, 33	32	29.0	27	80	160	Regular	●TWBT30	TX8030T30
★ ZRS3002320	30, 32, 33	32	29.0	27	100	220	Intermediate		
ZRS3003320	30, 32, 33	32	29.0	27	100	350	Long		

● : Required to use T-HANDLE (TWH600)
★ : Stock Item

ZRT SERIES

i-Xmill STEEL CORNER RADIUS HOLDER - TAPER NECK

i-Xmill STAHL HALTER für WECHSEL PLATTE mit ECKRADIUS - mit KONISCH ABGESETZTEM SCHAFTTEIL
Porte-plaquette i-Xmill en acier, entrée conique, pour plaquette torique
CORPO FRESA IN ACCIAIO PER INSERTI TORICI i-Xmill - CONICO



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Neck Diameter	Length of Cut	Length Below Shank	Overall Length	Interference Angle	Length Type	Wrench No.	Screw No.
	D1	D2	D3	L1	L3	L2	θ°			
★ ZRT0801120	8	12	6.7	10	22	100	9°	Regular	TWFT07	TX2508T07
★ ZRT0802120	8	12	6.7	10	50	130	2° 43′	Long		
★ ZRT1001120	10, 11	12	8.6	13	25	100	4° 45′	Regular	TWFT08	TX3010T08
★ ZRT1002120	10, 11	12	8.6	13	50	150	1° 32′	Long		

★ : Stock Item

i-Xmill END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

XMB110A SERIES — BALL INSERTS for GENERAL PURPOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
P	1-4	Non-alloy steel	Vc	160~320	160~360	160~380	160~480	160~580	160~600	160~700
			fz	0.20~0.20	0.20~0.20	0.20~0.20	0.25~0.30	0.25~0.40	0.25~0.50	0.25~0.60
			RPM	6370~12730	5090~11460	4240~10080	3180~9550	2550~9230	2040~7640	1700~7430
			FEED	2550~5090	2040~4580	1700~4030	1590~5730	1270~7380	1020~7640	850~8910
	5		Vc	120~280	120~300	120~350	120~380	120~420	120~480	120~550
			fz	0.20~0.20	0.20~0.20	0.20~0.20	0.25~0.30	0.25~0.40	0.25~0.50	0.25~0.60
			RPM	4770~11140	3820~9550	3180~9280	2390~7560	1910~6680	1530~6110	1270~5840
			FEED	1910~4460	1530~3820	1270~3710	1190~4540	950~5350	760~6110	640~7000
	6-7	Low alloy steel	Vc	160~320	160~360	160~380	160~480	160~580	160~600	160~700
			fz	0.20~0.20	0.20~0.20	0.20~0.20	0.25~0.30	0.25~0.40	0.25~0.50	0.25~0.60
			RPM	6370~12730	5090~11460	4240~10080	3180~9550	2550~9230	2040~7640	1700~7430
			FEED	2550~5090	2040~4580	1700~4030	1590~5730	1270~7380	1020~7640	850~8910
	8		Vc	120~280	120~300	120~350	120~380	120~420	120~480	120~550
			fz	0.20~0.20	0.20~0.20	0.20~0.20	0.25~0.30	0.25~0.40	0.25~0.50	0.25~0.60
			RPM	4770~11140	3820~9550	3180~9280	2390~7560	1910~6680	1530~6110	1270~5840
			FEED	1910~4460	1530~3820	1270~3710	1190~4540	950~5350	760~6110	640~7000

XMB120C SERIES — BALL INSERTS for PRE-HARDENED STEELS

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
P	9-11	Low alloy steel High alloyed steel, and tool steel	Vc	100~220	100~260	100~280	100~350	100~400	100~450	100~500
			fz	0.15~0.20	0.15~0.20	0.15~0.20	0.20~0.30	0.20~0.40	0.20~0.50	0.20~0.60
			RPM	3980~8750	3180~8280	2650~7430	1990~6960	1590~6370	1270~5730	1060~5310
			FEED	1190~3500	950~3310	800~2970	800~4180	640~5090	510~5730	420~6370
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	160~320	160~360	160~400	160~500	160~550	160~620	160~720
			fz	0.30~0.30	0.30~0.30	0.30~0.30	0.35~0.40	0.35~0.40	0.35~0.50	0.35~0.60
			RPM	6370~12730	5090~11460	4240~10610	3180~9950	2550~8750	2040~7890	1700~7640
			FEED	3820~7640	3060~6880	2550~6370	2230~7960	1780~7000	1430~7890	1190~9170
H	38	Hardened steel	Vc	80~180	80~200	80~220	80~260	80~320	80~360	80~400
			fz	0.10~0.20	0.10~0.20	0.10~0.20	0.15~0.30	0.15~0.40	0.15~0.50	0.15~0.60
			RPM	3180~7160	2550~6370	2120~5840	1590~5170	1270~5090	1020~4580	850~4240
			FEED	640~2860	510~2550	420~2330	480~3100	380~4070	310~4580	250~5090

XMB260T SERIES — BALL INSERTS for HIGH HARDENED STEELS

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
H	38-41	Hardened steel	Vc	80~180	80~200	80~220	80~260	80~320	80~360	80~400
			fz	0.10~0.15	0.10~0.15	0.10~0.15	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.30
			RPM	3180~7160	2550~6370	2120~5840	1590~5170	1270~5090	1020~4580	850~4240
			FEED	640~2150	510~1910	420~1750	480~2590	380~2550	310~2290	250~2550

XMB130A SERIES — BALL INSERTS for STAINLESS STEELS

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
M	12-14	Stainless steel	Vc	90~130	90~130	90~130	90~130	90~130	90~130	90~130
			fz	0.10~0.12	0.13~0.15	0.15~0.20	0.15~0.20	0.15~0.20	0.20~0.25	0.20~0.25
			RPM	3580~5170	2860~4140	2390~3450	1790~2590	1430~2070	1150~1660	950~1380
			FEED	720~1290	720~1240	720~1380	540~1030	430~830	460~830	380~690

i-Xmill END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

XMR110A SERIES — CORNER RADIUS INSERTS for GENERAL PURPOSE & STAINLESS STEELS

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
P	1-4	Non-alloy steel	Vc	160~300	160~300	160~300	160~300	160~300	160~300	160~300
			fz	0.20~0.15	0.20~0.15	0.20~0.15	0.25~0.20	0.25~0.20	0.25~0.20	0.25~0.20
			RPM	6370~11940	5090~9550	4240~7960	3180~5970	2550~4770	2040~3820	1700~3180
			FEED	2550~3580	2040~2860	1700~2390	1590~2390	1270~1910	1020~1530	850~1270
	5		Vc	120~280	120~280	120~280	120~280	120~280	120~280	120~280
			fz	0.20~0.15	0.20~0.15	0.20~0.15	0.25~0.20	0.25~0.20	0.25~0.20	0.25~0.20
			RPM	4770~11140	3820~8910	3180~7430	2390~5570	1910~4460	1530~3570	1270~2970
			FEED	1910~3340	1530~2670	1270~2230	1190~2230	950~1780	760~1430	640~1190
	6-7	Low alloy steel	Vc	160~300	160~300	160~300	160~300	160~300	160~300	160~300
			fz	0.20~0.15	0.20~0.15	0.20~0.15	0.25~0.20	0.25~0.20	0.25~0.20	0.25~0.20
			RPM	6370~11940	5090~9550	4240~7960	3180~5970	2550~4770	2040~3820	1700~3180
			FEED	2550~3580	2040~2860	1700~2390	1590~2390	1270~1910	1020~1530	850~1270
	8		Vc	120~280	120~280	120~280	120~280	120~280	120~280	120~280
			fz	0.20~0.15	0.20~0.15	0.20~0.15	0.25~0.20	0.25~0.20	0.25~0.20	0.25~0.20
			RPM	4770~11140	3820~8910	3180~7430	2390~5570	1910~4460	1530~3570	1270~2970
			FEED	1910~3340	1530~2670	1270~2230	1190~2230	950~1780	760~1430	640~1190
M	12-14	Stainless steel	Vc	90~130	90~130	90~130	90~130	90~130	90~130	90~130
			fz	0.10~0.10	0.11~0.11	0.12~0.11	0.13~0.13	0.13~0.13	0.13~0.12	0.13~0.12
			RPM	3580~5170	2860~4140	2390~3450	1790~2590	1430~2070	1150~1660	950~1380
			FEED	720~1030	630~910	550~790	450~650	360~520	290~410	240~340

XMR120C SERIES — CORNER RADIUS INSERTS for PRE-HARDENED STEELS

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
P	9-11	Low alloy steel High alloyed steel, and tool steel	Vc	100~280	100~280	100~280	100~280	100~280	100~280	100~280
			fz	0.12~0.06	0.13~0.06	0.13~0.06	0.15~0.08	0.15~0.08	0.15~0.08	0.15~0.08
			RPM	3980~11140	3180~8910	2650~7430	1990~5570	1590~4460	1270~3570	1060~2970
			FEED	990~1340	800~1070	690~890	600~840	480~670	380~570	320~450
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	160~380	160~380	160~380	160~380	160~380	160~380	160~380
			fz	0.30~0.20	0.30~0.20	0.30~0.20	0.35~0.30	0.35~0.30	0.35~0.30	0.35~0.30
			RPM	6370~15120	5090~12100	4240~10080	3180~7560	2550~6050	2040~4840	1700~4030
			FEED	3820~6050	3060~4840	2550~4030	2230~4540	1780~3630	1430~2900	1190~2420
H	38	Hardened steel	Vc	80~220	80~220	80~220	80~220	80~220	80~220	80~220
			fz	0.10~0.05	0.10~0.05	0.10~0.05	0.15~0.06	0.15~0.06	0.15~0.06	0.15~0.06
			RPM	3180~8750	2550~7000	2120~5840	1590~4380	1270~3500	1020~2800	850~2330
			FEED	640~880	510~700	420~580	420~530	380~420	310~340	250~280

XMR260T SERIES — CORNER RADIUS INSERTS for HIGH HARDENED STEELS

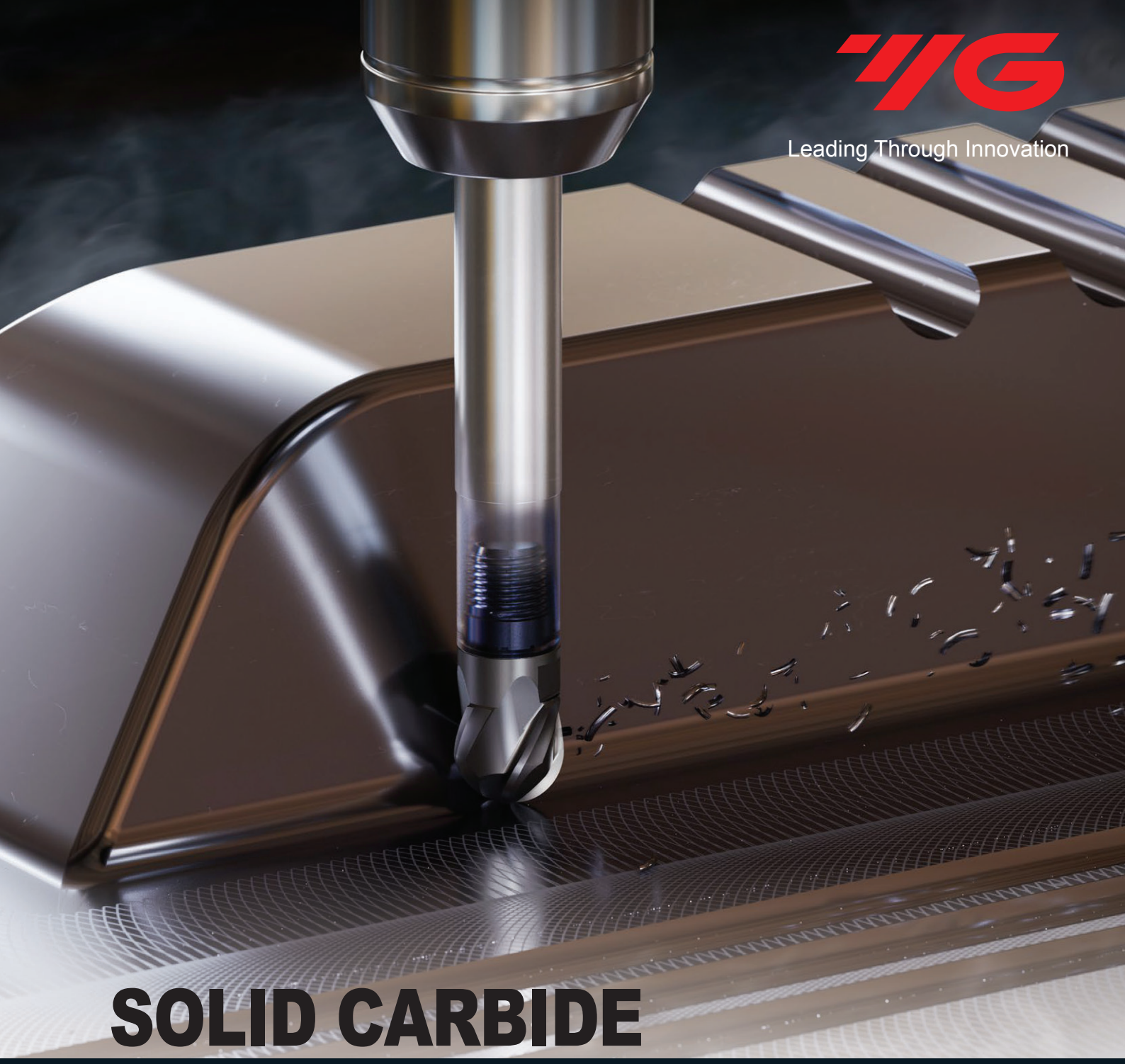
ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 8	10, 11	12, 13	16, 17	20, 21	25, 26	30, 32, 33
H	38-41	Hardened steel	Vc	80~220	80~220	80~220	80~220	80~220	80~220	80~220
			fz	0.10~0.05	0.10~0.05	0.10~0.05	0.15~0.06	0.15~0.06	0.15~0.06	0.15~0.06
			RPM	3180~8750	2550~7000	2120~5840	1590~4380	1270~3500	1020~2800	850~2330
			FEED	640~880	510~700	420~580	480~530	380~420	310~340	250~280

Global Cutting Tool Leader **YG-1**

MILLING

YG

Leading Through Innovation



SOLID CARBIDE

i-SMART MODULAR TYPE END MILL

i-Smart, Schaftfräser mit auswechselbaren VHM Schneidköpfen

- For General Steels, Hardened Steels and Cast Iron
- Für allgemeine Stähle, gehärtete Stähle und Gusseisen

SELECTION GUIDE

YG MILLING TOOLS

CARBIDE MODULAR HEAD & HOLDER i-SMART END MILLS

Ultra-micro Grain Carbide Heads with Carbide & Steel Holders

SERIES	XSEMD98	XSEME59	XSEME60
FLUTE	2	3	4
HELIX ANGLE	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R5.0	R5.0	R5.0
SIZE MAX	R16.0	R16.0	R16.0
PAGE	C64	C65	C66
	-	CENTER MATCH	CENTER MATCH
	Y-Coating	Y-Coating	Y-Coating

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C76

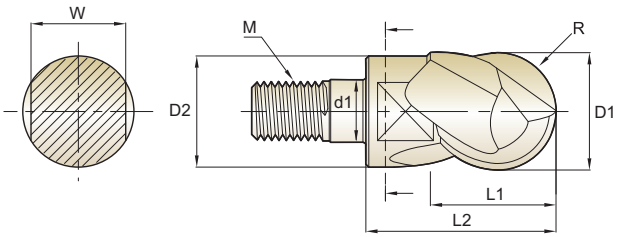
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○
	11			Quenched & Tempered	325	35	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○
	18		Pearlitic		250	25	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○
	20		Pearlitic		230	21	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55	○	○	○
	39			Hardened	630	60	○	○	○
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	○	○	○

i-Smart MODULAR END MILLS

XSEMD98 SERIES

CARBIDE MODULAR HEAD, 2 FLUTE BALL NOSE

- Vollhartmetall, 2 Schneiden mit Stirnradius (Schneiden Mittelpunkt)
- CARBURE TÊTE MODULAIRE, 2 DENTS À BOUT HÉMISPHÉRIQUE (Coupe au Centre)
- TESTINA MODULARE IN MD, 2 TAGLIENTI, SEMISFERICA



CARBIDE | 2 | 30° | R ±0.01 | Y Coating | p.C76

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
Y-COATED	R	D_1	D_2	L_1	L_2	W	d_1	M
XSEMD98100	R5.0	**10.0**	9.2	10	17.5	8	6.5	M6
XSEMD98120	R6.0	**12.0**	11.2	12	20.5	10	6.5	M6
XSEMD98160	R8.0	**16.0**	15.0	16	25.5	13	8.5	M8
XSEMD98200	R10.0	**20.0**	19.0	20	30.0	17	10.5	M10
XSEMD98250	R12.5	**25.0**	24.0	25	37.0	22	12.5	M12
XSEMD98300	R15.0	**30.0**	29.0	30	43.0	27	17.0	M16
XSEMD98320	R16.0	**32.0**	31.0	32	45.0	27	17.0	M16

Radius Tolerance(mm)	Mill Dia. Tolerance(mm)
± 0.01	0 ~ - 0.02

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	○	◎	○

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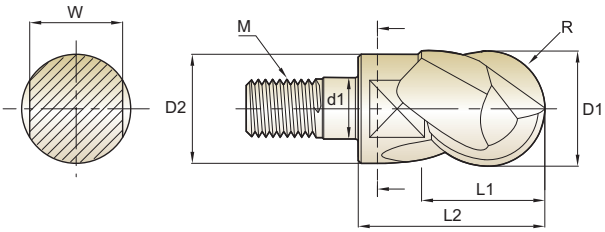
i-Smart MODULAR END MILLS

XSEME60 SERIES

CARBIDE MODULAR HEAD, 4 FLUTE BALL NOSE (Center Match)

Vollhartmetall, 4 Schneiden mit Stirnradius (Schneiden Mittelpunkt)
CARBURE TÊTE MODULAIRE, 4 DENTS À BOUT HÉMISPHÉRIQUE (Coupe au Centre)
TESTINA MODULARE IN MD, 4 TAGLIENTI, SEMISFERICA



CARBIDE | 4 | 30° | R ±0.01 | Y Coating | p.C77

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
Y-COATED	R	D_1	D_2	L_1	L_2	W	d_1	M
XSEME60100	R5.0	**10.0**	9.2	10	17.5	8	6.5	M6
XSEME60120	R6.0	**12.0**	11.2	12	20.5	10	6.5	M6
XSEME60160	R8.0	**16.0**	15.0	16	25.5	13	8.5	M8
XSEME60200	R10.0	**20.0**	19.0	20	30.0	17	10.5	M10
XSEME60250	R12.5	**25.0**	24.0	25	37.0	22	12.5	M12
XSEME60300	R15.0	**30.0**	29.0	30	43.0	27	17.0	M16
XSEME60320	R16.0	**32.0**	31.0	32	45.0	27	17.0	M16

Radius Tolerance(mm)	Mill Dia. Tolerance(mm)
± 0.01	0 ~ - 0.02

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

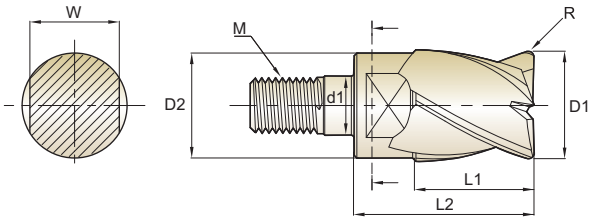
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	○	◎	○

i-Smart MODULAR END MILLS

XSEME01 SERIES

CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX CORNER RADIUS

Vollhartmetall, 4 Schneiden mit M-Helix und Eckradius
CARBURE TÊTE MODULAIRE, 4 DENTS TORIQUE, HÉLICE MULTIPLE
TESTINA MODULARE IN MD, 4 TAGLIENTI, ELICA VARIABILE, TORICA



CARBIDE | 4 | 27°/30° | R ±0.02 | Y Coating | p.C77

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
Y-COATED	R	D_1	D_2	L_1	L_2	W	d_1	M
XSEME01200 200	R2.0	**20.0**	19.0	20	30.0	17	10.5	M10
XSEME01250 050	R0.5	**25.0**	24.0	25	37.0	22	12.5	M12
XSEME01250 100	R1.0	**25.0**	24.0	25	37.0	22	12.5	M12
XSEME01250 150	R1.5	**25.0**	24.0	25	37.0	22	12.5	M12
XSEME01250 200	R2.0	**25.0**	24.0	25	37.0	22	12.5	M12
XSEME01300 050	R0.5	**30.0**	29.0	30	43.0	27	17.0	M16
XSEME01300 100	R1.0	**30.0**	29.0	30	43.0	27	17.0	M16
XSEME01300 150	R1.5	**30.0**	29.0	30	43.0	27	17.0	M16
XSEME01300 200	R2.0	**30.0**	29.0	30	43.0	27	17.0	M16
XSEME01320 050	R0.5	**32.0**	31.0	32	45.0	27	17.0	M16
XSEME01320 100	R1.0	**32.0**	31.0	32	45.0	27	17.0	M16
XSEME01320 150	R1.5	**32.0**	31.0	32	45.0	27	17.0	M16
XSEME01320 200	R2.0	**32.0**	31.0	32	45.0	27	17.0	M16

Radius Tolerance(mm)	Mill Dia. Tolerance(mm)
± 0.02	0 ~ - 0.03

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

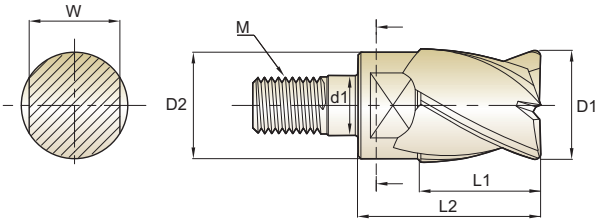
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	○	◎	○

i-Smart MODULAR END MILLS

XSEME36 SERIES

CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX

- Vollhartmetall, 4 Schneiden mit M-Helix
- CARBURE TÊTE MODULAIRE, 4 DENTS HÉLICE MULTIPLE
- TESTINA MODULARE IN MD, 4 TAGLIENTI, ELICA VARIABILE



CARBIDE | 4 | 27°/30° | Y Coating

p.C78

Unit : mm

EDP No.	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Wrench Width	Coupling Diameter	Thread
Y-COATED	D_1	D_2	L_1	L_2	W	d_1	M
XSEME36100	**10.0**	9.2	10	17.5	8	6.5	M6
XSEME36120	**12.0**	11.2	12	20.5	10	6.5	M6
XSEME36160	**16.0**	15.0	16	25.5	13	8.5	M8
XSEME36200	**20.0**	19.0	20	30.0	17	10.5	M10
XSEME36250	**25.0**	24.0	25	37.0	22	12.5	M12
XSEME36300	**30.0**	29.0	30	43.0	27	17.0	M16
XSEME36320	**32.0**	31.0	32	45.0	27	17.0	M16

Mill Dia. Tolerance(mm)
0 ~ - 0.03

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	○	◎	○

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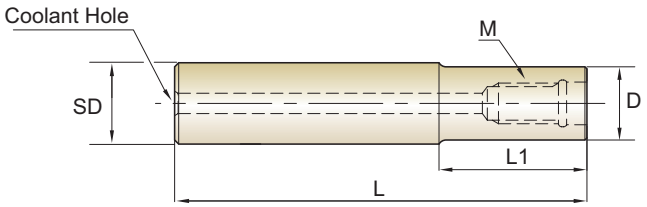
i-Smart MODULAR END MILLS

ZMC SERIES

CARBIDE HOLDER - STRAIGHT NECK TYPE

Vollhartmetallschaft - zylindrisch
PORTE-OUTIL CARBURE - Entrée Droite
STELO IN MD, SCARICO CILINDRICO



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread Size	Wrench No.	Coolant Hole
	D	SD	L	L_1	D	M		
ZMC1001100	**10.0**	10	70	20	9.5	M6	SPIS0810	2
ZMC1002100	**10.0**	10	100	40	9.5	M6	SPIS0810	2
ZMC1003100	**10.0**	10	130	70	9.5	M6	SPIS0810	2
ZMC1202120	**12.0**	12	100	40	11.5	M6	SPIS0810	2
ZMC1203120	**12.0**	12	130	70	11.5	M6	SPIS0810	2
ZMC1601160	**16.0**	16	100	40	15.5	M8	SPIS1300	3
ZMC1602160	**16.0**	16	150	80	15.5	M8	SPIS1300	3
ZMC1603160	**16.0**	16	200	120	15.5	M8	SPIS1300	3
ZMC2001200	**20.0**	20	100	40	19.5	M10	SPIS1700	4
ZMC2002200	**20.0**	20	150	80	19.5	M10	SPIS1700	4
ZMC2003200	**20.0**	20	200	120	19.5	M10	SPIS1700	4
ZMC2004200	**20.0**	20	250	160	19.5	M10	SPIS1700	4
ZMC2501250	**25.0**	25	150	70	24.3	M12	SPIS2200	5
ZMC2502250	**25.0**	25	200	100	24.3	M12	SPIS2200	5
ZMC2503250	**25.0**	25	250	150	24.3	M12	SPIS2200	5
ZMC2504250	**25.0**	25	300	200	24.3	M12	SPIS2200	5
ZMC3001320	**30.0 / 32.0**	32	150	70	29.0	M16	SPIS2700	6
ZMC3002320	**30.0 / 32.0**	32	200	120	29.0	M16	SPIS2700	6
ZMC3003320	**30.0 / 32.0**	32	250	150	29.0	M16	SPIS2700	6
ZMC3004320	**30.0 / 32.0**	32	300	200	29.0	M16	SPIS2700	6
ZMC3005320	**30.0 / 32.0**	32	350	250	29.0	M16	SPIS2700	6

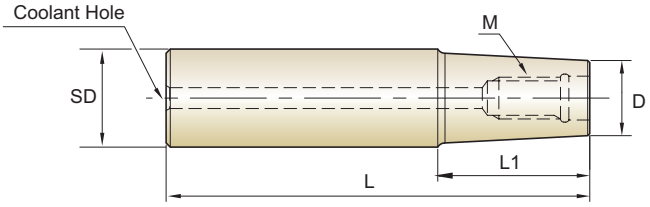
▶ The wrench (1pc) for the relevant item is included. More items are available for sale upon request.
▶ Please refer to the wrench table on the page C79.

i-Smart MODULAR END MILLS

ZMT SERIES

STEEL HOLDER - TAPER NECK TYPE

Stahlschaft - konisch
PORTE-OUTIL ACIER - Entrée Coniquee
STELO IN ACCIAIO, SCARICO CONICO



Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread Size	Wrench No.	Coolant Hole
	D	SD	L	L_1	D	M		
ZMT1001120	**10.0**	12	100	50	9	M6	SPIS0810	3
ZMT1201160	**12.0**	16	130	70	11	M6	SPIS0810	3
ZMT1601200	**16.0**	20	150	90	15	M8	SPIS1300	4
ZMT2001250	**20.0**	25	170	100	19	M10	SPIS1700	5
ZMT3001320	**30.0 / 32.0**	32	200	110	29	M16	SPIS2700	6

▶ The wrench (1pc) for the relevant item is included. More items are available for sale upon request.
▶ Please refer to the wrench table on the page C79.

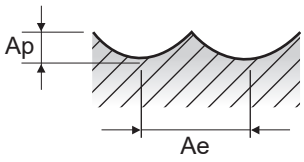
i-Smart MODULAR END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

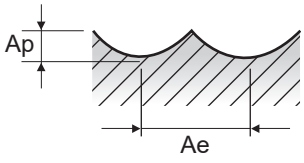
XSEMD98 SERIES — 2 FLUTE BALL NOSE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 10	12	16	20	25	30	32
P	1-8	Non-alloy steel	0.08D	0.03D	Vc	175	170	168	168	167	167	167
					fz	0.199	0.212	0.238	0.264	0.270	0.299	0.300
					RPM	5580	4510	3340	2670	2130	1770	1660
					FEED	2220	1910	1590	1410	1150	1060	995
	9	Low alloy steel	0.08D	0.03D	Vc	168	165	162	162	162	162	162
					fz	0.174	0.188	0.206	0.227	0.231	0.250	0.250
					RPM	5340	4380	3220	2580	2060	1720	1610
					FEED	1860	1645	1320	1170	950	860	805
	10-11.1	High alloyed steel, and tool steel	0.08D	0.03D	Vc	175	170	168	168	167	167	167
					fz	0.199	0.212	0.238	0.264	0.270	0.299	0.300
					RPM	5580	4510	3340	2670	2130	1770	1660
					FEED	2220	1910	1590	1410	1150	1060	995
	11.2		0.08D	0.03D	Vc	168	165	162	162	162	162	162
					fz	0.174	0.188	0.206	0.227	0.231	0.250	0.250
					RPM	5340	4380	3220	2580	2060	1720	1610
					FEED	1860	1645	1320	1170	950	860	805
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.03D	Vc	175	170	168	168	167	167	167
					fz	0.199	0.212	0.238	0.264	0.270	0.299	0.300
					RPM	5580	4510	3340	2670	2130	1770	1660
					FEED	2220	1910	1590	1410	1150	1060	995
H	38.1 - 38.2	Hardened steel	0.08D	0.03D	Vc	141	138	136	136	136	136	136
					fz	0.160	0.170	0.189	0.208	0.211	0.229	0.230
					RPM	4500	3660	2700	2160	1730	1440	1350
					FEED	1440	1245	1020	900	730	660	620
	40	Chilled Cast Iron	0.08D	0.03D	Vc	168	165	162	162	162	162	162
					fz	0.174	0.188	0.206	0.227	0.231	0.250	0.250
					RPM	5340	4380	3220	2580	2060	1720	1610
					FEED	1860	1645	1320	1170	950	860	805
	41	Hardened Cast Iron	0.08D	0.03D	Vc	141	138	136	136	136	136	136
					fz	0.160	0.170	0.189	0.208	0.211	0.229	0.230
					RPM	4500	3660	2700	2160	1730	1440	1350
					FEED	1440	1245	1020	900	730	660	620



XSEME59 SERIES — 3 FLUTE BALL NOSE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 10	12	16	20	25	30	32
P	1-8	Non-alloy steel	0.05D	0.02D	Vc	307	307	307	307	307	307	307
					fz	0.201	0.225	0.234	0.238	0.248	0.259	0.268
					RPM	9770	8150	6100	4880	3910	3260	3050
					FEED	5890	5490	4280	3490	2910	2530	2450
	9	Low alloy steel	0.05D	0.02D	Vc	257	257	257	257	257	257	257
					fz	0.168	0.187	0.199	0.209	0.219	0.230	0.234
					RPM	8190	6830	5110	4090	3270	2730	2560
					FEED	4130	3830	3050	2560	2150	1880	1800
	10-11.1	High alloyed steel, and tool steel	0.05D	0.02D	Vc	307	307	307	307	307	307	307
					fz	0.201	0.225	0.234	0.238	0.248	0.259	0.268
					RPM	9770	8150	6100	4880	3910	3260	3050
					FEED	5890	5490	4280	3490	2910	2530	2450
	11.2		0.05D	0.02D	Vc	257	257	257	257	257	257	257
					fz	0.168	0.187	0.199	0.209	0.219	0.230	0.234
					RPM	8190	6830	5110	4090	3270	2730	2560
					FEED	4130	3830	3050	2560	2150	1880	1800
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.02D	Vc	307	307	307	307	307	307	307
					fz	0.201	0.225	0.234	0.238	0.248	0.259	0.268
					RPM	9770	8150	6100	4880	3910	3260	3050
					FEED	5890	5490	4280	3490	2910	2530	2450
H	38.1 - 38.2	Hardened steel	0.05D	0.02D	Vc	208	208	208	208	208	208	208
					fz	0.156	0.173	0.180	0.190	0.200	0.210	0.221
					RPM	6620	5520	4140	3310	2650	2210	2070
					FEED	3100	2870	2240	1890	1590	1390	1370
	40	Chilled Cast Iron	0.05D	0.02D	Vc	257	257	257	257	257	257	257
					fz	0.168	0.187	0.199	0.209	0.219	0.230	0.234
					RPM	8190	6830	5110	4090	3270	2730	2560
					FEED	4130	3830	3050	2560	2150	1880	1800
	41	Hardened Cast Iron	0.05D	0.02D	Vc	208	208	208	208	208	208	208
					fz	0.156	0.173	0.180	0.190	0.200	0.210	0.221
					RPM	6620	5520	4140	3310	2650	2210	2070
					FEED	3100	2870	2240	1890	1590	1390	1370



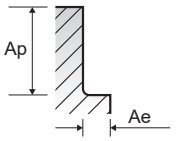
i-Smart MODULAR END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

XSEME68 SERIES — 6 FLUTE CORNER RADIUS - SIDE CUTTING

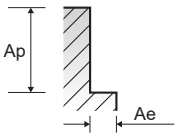
Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 10	12	16	20	25	30	32
P	1-8	Non-alloy steel	0.05D	1.0D	Vc	302	302	302	302	302	302	302
					fz	0.051	0.058	0.067	0.070	0.070	0.075	0.075
					RPM	9600	8010	6000	4800	3850	3200	3000
					FEED	2940	2790	2400	2010	1615	1440	1350
	9	Low alloy steel	0.05D	1.0D	Vc	294	294	294	294	294	294	294
					fz	0.025	0.025	0.025	0.025	0.027	0.029	0.030
					RPM	9360	7800	5850	4680	3740	3120	2920
					FEED	1400	1170	880	690	600	540	525
	10-11.1	High alloyed steel, and tool steel	0.05D	1.0D	Vc	302	302	302	302	302	302	302
					fz	0.051	0.058	0.067	0.070	0.070	0.075	0.075
					RPM	9600	8010	6000	4800	3850	3200	3000
					FEED	2940	2700	2400	2010	1615	1440	1350
	11.2		0.05D	1.0D	Vc	294	294	294	294	294	294	294
					fz	0.025	0.025	0.025	0.025	0.027	0.029	0.030
					RPM	9360	7800	5850	4680	3740	3120	2920
					FEED	1400	1170	880	690	600	540	525
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	Vc	302	302	302	302	302	302	302
					fz	0.051	0.058	0.067	0.070	0.070	0.075	0.075
					RPM	9600	8010	6000	4800	3850	3200	3000
					FEED	2940	2790	2400	2010	1615	1440	1350
H	38.1 - 38.2	Hardened steel	0.02D	1.0D	Vc	181	181	181	181	181	181	181
					fz	0.006	0.006	0.006	0.006	0.007	0.007	0.007
					RPM	5760	4800	3600	2880	2305	1920	1800
					FEED	210	180	130	110	90	85	80
	40	Chilled Cast Iron	0.05D	1.0D	Vc	294	294	294	294	294	294	294
					fz	0.025	0.025	0.025	0.025	0.027	0.029	0.030
					RPM	9360	7800	5850	4680	3740	3120	2920
					FEED	1400	1170	880	690	600	540	525
	41	Hardened Cast Iron	0.02D	1.0D	Vc	181	181	181	181	181	181	181
					fz	0.006	0.006	0.006	0.006	0.007	0.007	0.007
					RPM	5760	4800	3600	2880	2305	1920	1800
					FEED	210	180	130	110	90	85	80



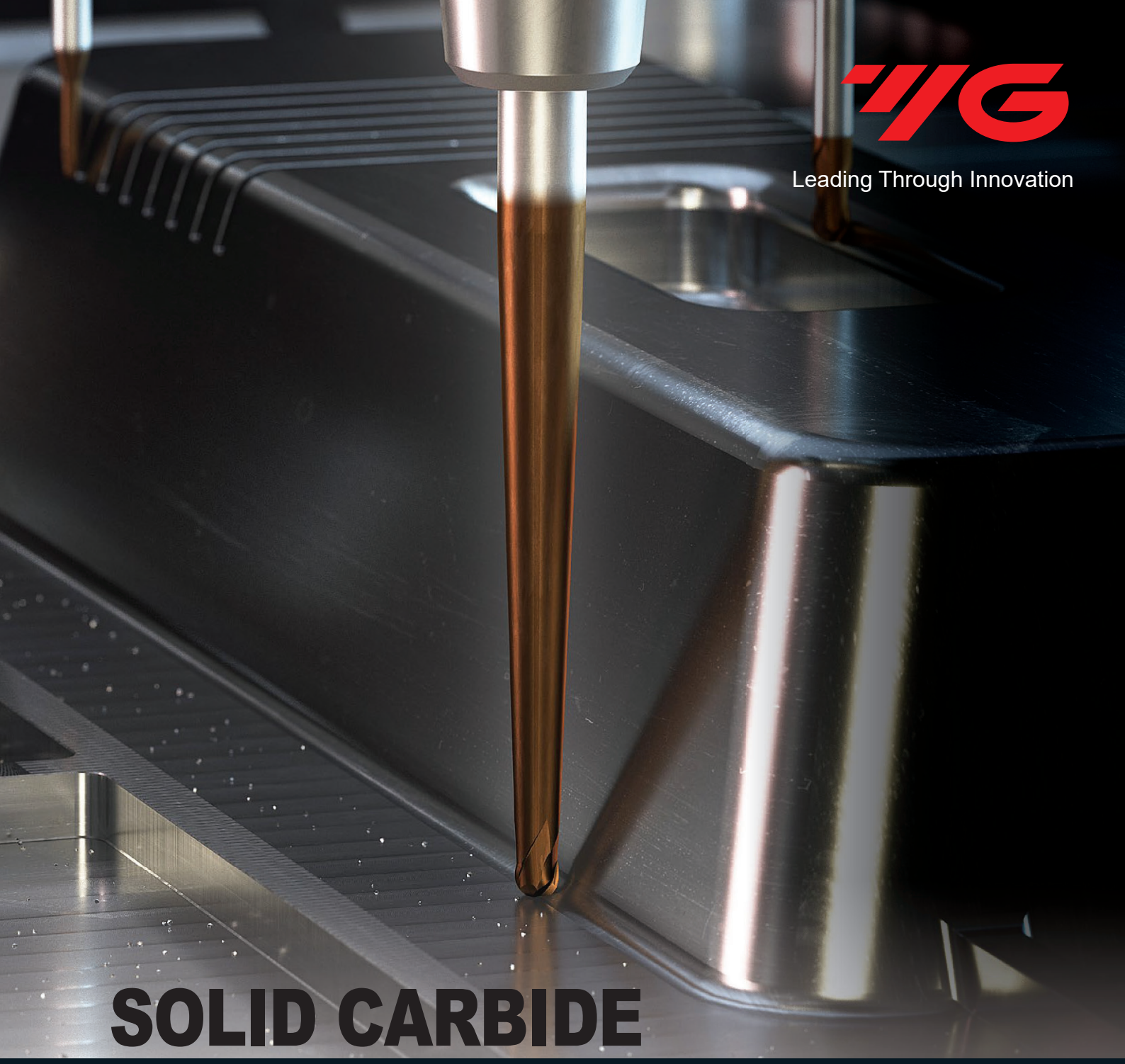
XSEME36 SERIES — 4 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 10	12	16	20	25	30	32
P	1-8	Non-alloy steel	0.05D	0.6D	Vc	128	129	130	132	134	134	134
					fz	0.040	0.040	0.040	0.040	0.040	0.040	0.040
					RPM	4080	3430	2590	2100	1700	1420	1330
					FEED	650	545	415	335	270	230	215
	9	Low alloy steel	0.05D	0.6D	Vc	79	79	80	82	82	82	82
					fz	0.030	0.030	0.030	0.030	0.031	0.032	0.032
					RPM	2500	2100	1590	1300	1050	870	820
					FEED	300	250	190	155	130	110	105
	10-11.1	High alloyed steel, and tool steel	0.05D	0.6D	Vc	128	129	130	132	134	134	134
					fz	0.040	0.040	0.040	0.040	0.040	0.040	0.040
					RPM	4080	3430	2590	2100	1700	1420	1330
					FEED	650	545	415	335	270	230	215
	11.2		0.05D	0.6D	Vc	79	79	80	82	82	82	82
					fz	0.030	0.030	0.030	0.030	0.031	0.032	0.032
					RPM	2500	2100	1590	1300	1050	870	820
					FEED	300	250	190	155	130	110	105
M	12-14	Stainless steel	0.05D	0.6D	Vc	66	66	66	66	67	67	67
					fz	0.035	0.035	0.035	0.035	0.035	0.035	0.035
					RPM	2100	1750	1310	1050	850	710	670
					FEED	300	245	180	150	120	100	95
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.6D	Vc	128	129	130	132	134	134	134
					fz	0.039	0.040	0.040	0.040	0.040	0.040	0.040
					RPM	4080	3430	2590	2100	1700	1420	1330
					FEED	640	545	415	335	270	230	215
H	38.1 - 38.2	Hardened steel	0.05D	0.6D	Vc	53	53	53	53	53	53	53
					fz	0.013	0.013	0.013	0.012	0.011	0.011	0.011
					RPM	1700	1400	1050	850	680	560	530
					FEED	90	70	55	40	30	25	25
	40	Chilled Cast Iron	0.05D	0.6D	Vc	79	79	80	82	82	82	82
					fz	0.030	0.030	0.030	0.030	0.031	0.032	0.032
					RPM	2500	2100	1590	1300	1050	870	820
					FEED	300	250	190	155	130	110	105
	41	Hardened Cast Iron	0.05D	0.6D	Vc	53	53	53	53	53	53	53
					fz	0.013	0.013	0.013	0.012	0.011	0.011	0.011
					RPM	1700	1400	1050	850	680	560	530
					FEED	90	70	55	40	30	25	25



Global Cutting Tool Leader **YG-1**

MILLING



Leading Through Innovation

SOLID CARBIDE

X1-EH END MILLS

X1-EH VHM - FRÄSER

- Highly Accurate Fine-Finishing for High Hardened Steel
- Hochpräzise Feinbearbeitung für hochgehärtete Stähle

SELECTION GUIDE

YG MILLING TOOLS

SERIES	HPI90	HPI91	HPI92	HPI89	HPI88
FLUTE	2	2	2	2	2
HELIX ANGLE	30°	30°	30°	35°	35°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE
SIZE MIN	R0.05	R0.05	R0.05	D0.2	D0.1
SIZE MAX	R10.0	R3.0	R6.0	D3.0	D6.0
PAGE	C83	C84	C94	C103	C110
	-	RIB PROCESSING	TAPER NECK	RIB PROCESSING	RIB PROCESSING
	C-Coating	C-Coating	C-Coating	C-Coating	C-Coating

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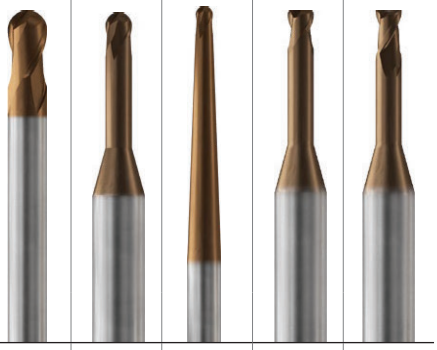
DIE & MOLD

SOLID CARBIDE X1-EH END MILLS

Highly Accurate Fine-Finishing for High Hardened Steel



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C116

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	HPI90	HPI91	HPI92	HPI89	HPI88
P	1	Non-alloy steel	About 0.15% C	Annealed	125						
	2		About 0.45% C	Annealed	190	13					
	3		About 0.45% C	Quenched & tempered	250	25					
	4		About 0.75% C	Annealed	270	28					
	5		About 0.75% C	Quenched & tempered	300	32	○	○	○	○	○
	6	Low alloy steel		Annealed	180	10					
	7			Quenched & tempered	275	29					
	8			Quenched & tempered	300	32	○	○	○	○	○
	9			Quenched & tempered	350	38	○	○	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15					
	11.1			Quenched & Tempered	325	35	○	○	○	○	○
	11.2			Quenched & Tempered	409	44	○	○	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15					
	13		Martensitic	Quenched & Tempered	240	23					
	14.1			Austenitic	180	10					
K	15	Grey cast iron	Pearlitic / ferritic		180	10					
	16		Pearlitic (Martensitic)		260	26					
	17	Nodular cast iron	Ferritic		160	3					
	18		Pearlitic		250	25					
	19	Malleable cast iron	Ferritic		130						
	20		Pearlitic		230	21					
N	21	Aluminum-wrought alloy	Not Curable		60						
	22		Curable	Hardened	100						
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75						
	24		≤ 12% Si, Curable	Hardened	90						
	25		> 12% Si, Not Curable		130						
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						
	27		CuZn, CuSnZn (Brass)		90						
	28		CuSn, lead-free copper and electrolytic copper		100						
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm						
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	421-469	45-49	◎	◎	◎	◎	◎
	39			Hardened		66-70	◎	◎	◎	◎	◎
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○	○
	41	Hardened Cast Iron		Hardened	550	55	◎	◎	◎	◎	◎

X1-EH END MILLS

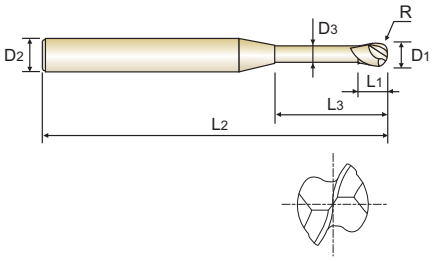
PLAIN SHANK **HPI91 SERIES**

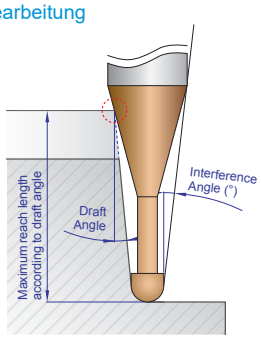
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, hémisphérique pour usinage de rainure
2 TAGLIENTI, SEMISFERICA, SCARICATA PER NERVATURE

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.

- Verbesserung der Werkzeugstandzeit durch Aufbringen einer neuen Beschichtung
- Enge Toleranzen für die Präzisionsbearbeitung





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91001	R0.05	**0.1**	4	0.07	0.2	45	0.085	14.66	0.25	0.26	0.28	0.29	0.32
HPI91901	R0.05	**0.1**	4	0.07	0.3	45	0.085	14.47	0.36	0.37	0.39	0.41	0.47
HPI91902	R0.05	**0.1**	4	0.07	0.5	45	0.085	14.11	0.57	0.60	0.63	0.66	0.75
HPI910015	R0.075	**0.15**	4	0.1	0.3	45	0.135	14.51	0.36	0.37	0.39	0.41	0.46
HPI91903	R0.075	**0.15**	4	0.1	0.5	45	0.135	14.15	0.57	0.59	0.62	0.66	0.74
HPI91904	R0.075	**0.15**	4	0.1	1	45	0.135	13.31	1.09	1.15	1.21	1.28	1.45
HPI91002	R0.1	**0.2**	4	0.15	0.3	45	0.17	14.50	0.40	0.42	0.43	0.46	0.51
HPI91905	R0.1	**0.2**	4	0.15	0.5	45	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91906	R0.1	**0.2**	4	0.15	0.75	45	0.17	13.70	0.87	0.92	0.96	1.02	1.15
HPI91907	R0.1	**0.2**	4	0.15	1	45	0.17	13.29	1.14	1.19	1.26	1.33	1.50
HPI91908	R0.1	**0.2**	4	0.15	1	50	0.17	13.29	1.14	1.19	1.26	1.33	1.50
HPI91909	R0.1	**0.2**	4	0.15	1.25	45	0.17	12.90	1.40	1.47	1.55	1.64	1.86
HPI91910	R0.1	**0.2**	4	0.15	1.5	45	0.17	12.53	1.66	1.75	1.84	1.95	2.21
HPI91911	R0.1	**0.2**	4	0.15	1.75	45	0.17	12.19	1.93	2.03	2.14	2.26	2.57
HPI91912	R0.1	**0.2**	4	0.15	2	45	0.17	11.86	2.19	2.30	2.43	2.58	2.92
HPI91913	R0.1	**0.2**	4	0.15	2.5	45	0.17	11.26	2.71	2.86	3.02	3.20	3.64
HPI91914	R0.1	**0.2**	4	0.15	3	45	0.17	10.71	3.24	3.41	3.61	3.82	4.35
HPI91915	R0.1	**0.2**	4	0.2	0.5	35	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91916	R0.1	**0.2**	4	0.2	0.5	50	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91917	R0.1	**0.2**	6	0.2	0.5	50	0.17	14.42	0.61	0.64	0.67	0.70	0.79
HPI91003	R0.15	**0.3**	4	0.2	0.5	45	0.27	14.20	0.61	0.63	0.66	0.69	0.77
HPI91918	R0.15	**0.3**	4	0.2	0.6	45	0.27	14.02	0.71	0.74	0.78	0.82	0.91
HPI91919	R0.15	**0.3**	4	0.2	0.75	45	0.27	13.75	0.87	0.91	0.95	1.00	1.12
HPI91920	R0.15	**0.3**	4	0.2	1	45	0.27	13.33	1.13	1.19	1.25	1.32	1.48
HPI91921	R0.15	**0.3**	4	0.2	1.25	45	0.27	12.93	1.40	1.47	1.54	1.63	1.84
HPI91922	R0.15	**0.3**	4	0.2	1.5	45	0.27	12.55	1.66	1.74	1.84	1.94	2.19

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, hémisphérique pour usinage de rainure
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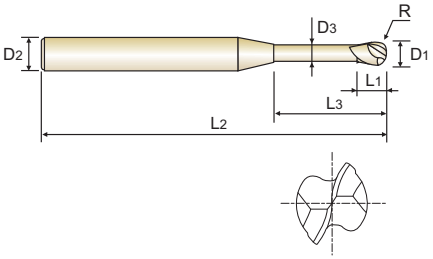

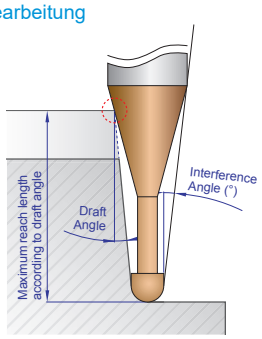

CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91952	R0.25	**0.5**	4	0.35	4	45	0.45	9.57	4.34	4.57	4.82	5.10	5.79
HPI91953	R0.25	**0.5**	4	0.35	4.5	45	0.45	9.14	4.87	5.12	5.41	5.73	6.50
HPI91954	R0.25	**0.5**	4	0.35	5	45	0.45	8.75	5.40	5.68	5.99	6.35	7.21
HPI91955	R0.25	**0.5**	4	0.35	5.5	45	0.45	8.38	5.92	6.23	6.58	6.97	7.92
HPI91956	R0.25	**0.5**	4	0.35	6	45	0.45	8.05	6.45	6.79	7.17	7.60	8.63
HPI91957	R0.25	**0.5**	4	0.35	8	45	0.45	6.94	8.55	9.01	9.52	10.09	11.43
HPI91958	R0.25	**0.5**	4	0.35	10	45	0.45	6.10	10.66	11.23	11.87	12.58	13.76
HPI91959	R0.25	**0.5**	4	0.5	1.25	50	0.45	12.93	1.45	1.52	1.59	1.67	1.87
HPI91960	R0.25	**0.5**	6	0.5	1.25	50	0.45	13.61	1.45	1.52	1.59	1.67	1.87
HPI91006	R0.3	**0.6**	4	0.45	1	45	0.55	13.40	1.19	1.23	1.29	1.35	1.50
HPI91961	R0.3	**0.6**	4	0.45	1.5	45	0.55	12.55	1.71	1.79	1.88	1.97	2.21
HPI91962	R0.3	**0.6**	4	0.45	2	45	0.55	11.80	2.24	2.34	2.46	2.60	2.92
HPI91963	R0.3	**0.6**	4	0.45	2.5	45	0.55	11.13	2.76	2.90	3.05	3.22	3.63
HPI91964	R0.3	**0.6**	4	0.45	3	45	0.55	10.54	3.29	3.45	3.64	3.84	4.34
HPI91965	R0.3	**0.6**	4	0.45	3.5	45	0.55	10.00	3.82	4.01	4.22	4.47	5.06
HPI91967	R0.3	**0.6**	4	0.45	4.5	45	0.55	9.08	4.87	5.12	5.40	5.71	6.48
HPI91968	R0.3	**0.6**	4	0.45	5	45	0.55	8.68	5.39	5.67	5.99	6.34	7.19
HPI91969	R0.3	**0.6**	4	0.45	5.5	45	0.55	8.31	5.92	6.23	6.57	6.96	7.90
HPI91970	R0.3	**0.6**	4	0.45	6	45	0.55	7.97	6.45	6.78	7.16	7.58	8.61
HPI91971	R0.3	**0.6**	4	0.45	7	45	0.55	7.37	7.50	7.89	8.34	8.83	10.04
HPI91972	R0.3	**0.6**	4	0.45	8	45	0.55	6.86	8.55	9.00	9.51	10.08	11.36
HPI91973	R0.3	**0.6**	4	0.45	9	45	0.55	6.41	9.60	10.11	10.68	11.33	12.53
HPI91974	R0.3	**0.6**	4	0.45	10	45	0.55	6.01	10.65	11.22	11.86	12.57	13.70
HPI91975	R0.3	**0.6**	4	0.45	12	45	0.55	5.35	12.76	13.44	14.21	15.07	16.03
HPI91976	R0.3	**0.6**	4	0.6	1.5	35	0.55	12.55	1.71	1.79	1.88	1.97	2.21
HPI91977	R0.3	**0.6**	4	0.6	1.5	50	0.55	12.55	1.71	1.79	1.88	1.97	2.21

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

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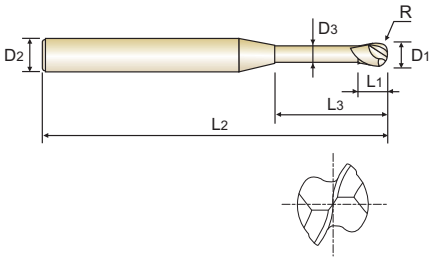

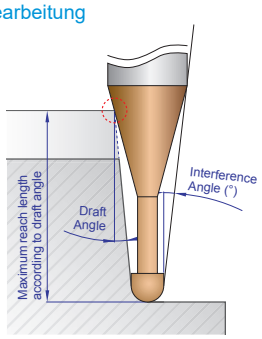

CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91803	R0.5	**1.0**	4	0.75	4	45	0.95	9.27	4.33	4.54	4.78	5.04	5.68
HPI91804	R0.5	**1.0**	4	0.75	5	45	0.95	8.37	5.38	5.65	5.95	6.29	7.10
HPI91805	R0.5	**1.0**	4	0.75	6	45	0.95	7.63	6.44	6.76	7.13	7.54	8.53
HPI91807	R0.5	**1.0**	4	0.75	8	45	0.95	6.49	8.54	8.98	9.47	10.03	11.10
HPI91808	R0.5	**1.0**	4	0.75	9	45	0.95	6.03	9.59	10.09	10.65	11.28	12.26
HPI91809	R0.5	**1.0**	4	0.75	10	45	0.95	5.64	10.64	11.20	11.82	12.52	13.43
HPI91810	R0.5	**1.0**	4	0.75	12	45	0.95	4.99	12.75	13.42	14.17	14.96	15.77
HPI91811	R0.5	**1.0**	4	0.75	13	45	0.95	4.71	13.80	14.53	15.35	16.06	16.94
HPI91812	R0.5	**1.0**	4	0.75	14	50	0.95	4.47	14.85	15.64	16.52	17.17	18.10
HPI91813	R0.5	**1.0**	4	0.75	16	50	0.95	4.05	16.96	17.86	18.87	19.38	20.44
HPI91814	R0.5	**1.0**	4	0.75	18	55	0.95	3.70	19.06	20.08	21.05	21.59	22.78
HPI91815	R0.5	**1.0**	4	0.75	20	55	0.95	3.41	21.16	22.30	23.20	23.81	25.11
HPI91816	R0.5	**1.0**	4	1	2.5	40	0.95	11.04	2.75	2.88	3.02	3.17	3.55
HPI91817	R0.5	**1.0**	4	1	2.5	50	0.95	11.04	2.75	2.88	3.02	3.17	3.55
HPI91818	R0.5	**1.0**	6	0.75	3	50	0.95	11.84	3.28	3.43	3.60	3.79	4.26
HPI91819	R0.5	**1.0**	6	0.75	4	50	0.95	10.95	4.33	4.54	4.78	5.04	5.68
HPI91820	R0.5	**1.0**	6	0.75	5	50	0.95	10.18	5.38	5.65	5.95	6.29	7.10
HPI91821	R0.5	**1.0**	6	0.75	6	50	0.95	9.51	6.44	6.76	7.13	7.54	8.53
HPI91822	R0.5	**1.0**	6	0.75	7	50	0.95	8.92	7.49	7.87	8.30	8.78	9.95
HPI91823	R0.5	**1.0**	6	0.75	8	50	0.95	8.40	8.54	8.98	9.47	10.03	11.37
HPI91824	R0.5	**1.0**	6	0.75	10	50	0.95	7.53	10.64	11.20	11.82	12.52	14.22
HPI91825	R0.5	**1.0**	6	0.75	22	60	0.95	4.62	23.27	24.52	25.92	27.11	28.60
HPI91826	R0.5	**1.0**	6	1	2.5	50	0.95	12.34	2.75	2.88	3.02	3.17	3.55
HPI91012	R0.6	**1.2**	4	0.9	2.4	45	1.15	11.13	2.56	2.63	2.70	2.78	2.95
HPI91827	R0.6	**1.2**	4	0.9	4	45	1.15	9.12	4.21	4.34	4.47	4.62	4.94
HPI91828	R0.6	**1.2**	4	0.9	6	45	1.15	7.44	6.28	6.48	6.69	6.92	7.43

▶ NEXT PAGE

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VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

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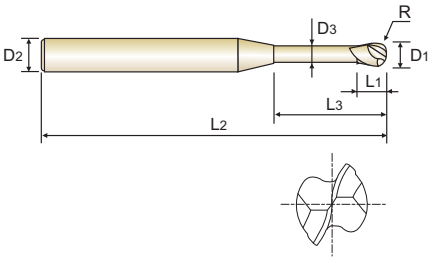

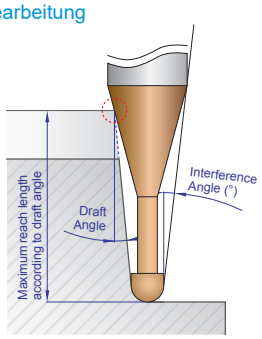

CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91853	R0.8	1.6	4	1.2	12	45	1.55	4.35	12.47	12.88	13.32	13.79	14.84
HPI91854	R0.8	1.6	4	1.2	16	50	1.55	3.47	16.61	17.16	17.75	18.39	19.81
HPI91855	R0.8	1.6	4	1.2	20	55	1.55	2.89	20.74	21.44	22.18	22.98	-
HPI91020	R1.0	2.0	4	1.5	3	45	1.95	9.74	3.16	3.24	3.32	3.41	3.60
HPI91856	R1.0	2.0	4	1.5	4	45	1.95	8.34	4.20	4.31	4.43	4.56	4.85
HPI91857	R1.0	2.0	4	1.5	6	45	1.95	6.46	6.26	6.45	6.64	6.86	7.33
HPI91858	R1.0	2.0	4	1.5	8	45	1.95	5.28	8.33	8.59	8.86	9.16	9.82
HPI91859	R1.0	2.0	4	1.5	10	45	1.95	4.46	10.40	10.73	11.08	11.46	12.30
HPI91860	R1.0	2.0	4	1.5	12	45	1.95	3.86	12.47	12.87	13.29	13.76	14.79
HPI91861	R1.0	2.0	4	1.5	13	45	1.95	3.62	13.50	13.94	14.40	14.91	16.03
HPI91862	R1.0	2.0	4	1.5	14	50	1.95	3.40	14.53	15.01	15.51	16.06	17.28
HPI91863	R1.0	2.0	4	1.5	16	50	1.95	3.04	16.60	17.15	17.73	18.36	19.76
HPI91864	R1.0	2.0	4	1.5	18	55	1.95	2.75	18.67	19.28	19.94	20.65	-
HPI91865	R1.0	2.0	4	1.5	20	55	1.95	2.51	20.74	21.42	22.16	22.95	-
HPI91866	R1.0	2.0	4	1.5	22	60	1.95	2.31	22.80	23.56	24.38	25.25	-
HPI91867	R1.0	2.0	4	1.5	25	65	1.95	2.06	25.90	26.77	27.70	28.70	-
HPI91868	R1.0	2.0	4	1.5	30	70	1.95	1.74	31.07	32.12	33.24	-	-
HPI91869	R1.0	2.0	4	1.5	35	70	1.95	1.51	36.24	37.47	38.79	-	-
HPI91870	R1.0	2.0	4	1.5	40	90	1.95	1.34	41.41	42.82	-	-	-
HPI91871	R1.0	2.0	4	2	5	40	1.95	7.28	5.23	5.38	5.54	5.71	6.09
HPI91872	R1.0	2.0	4	2	5	50	1.95	7.28	5.23	5.38	5.54	5.71	6.09
HPI91873	R1.0	2.0	6	1.5	4	50	1.95	10.73	4.20	4.31	4.43	4.56	4.85
HPI91874	R1.0	2.0	6	1.5	6	50	1.95	9.05	6.26	6.45	6.64	6.86	7.33
HPI91875	R1.0	2.0	6	1.5	8	50	1.95	7.82	8.33	8.59	8.86	9.16	9.82
HPI91876	R1.0	2.0	6	1.5	10	50	1.95	6.89	10.40	10.73	11.08	11.46	12.30
HPI91877	R1.0	2.0	6	1.5	16	60	1.95	5.07	16.60	17.15	17.73	18.36	19.76

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

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X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, hémisphérique pour usinage de rainure
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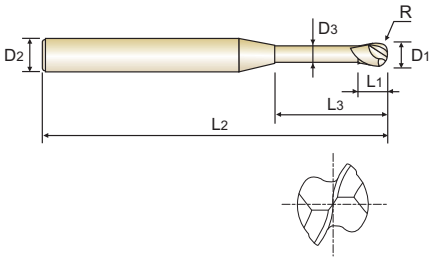

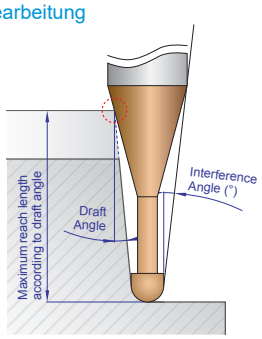

CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91703	R1.75	**3.5**	6	2.8	35	80	3.35	1.87	36.41	37.62	38.91	-	-
HPI91704	R1.75	**3.5**	6	2.8	40	90	3.35	1.66	41.58	42.96	44.45	-	-
HPI91705	R1.75	**3.5**	6	2.8	45	90	3.35	1.49	46.75	48.31	-	-	-
HPI91040	R2.0	**4.0**	4	3	8	65	3.85	0.00	-	-	-	-	-
HPI91706	R2.0	**4.0**	6	3	8	65	3.85	5.70	8.49	8.72	8.96	9.22	9.81
HPI91708	R2.0	**4.0**	6	3	12	65	3.85	4.08	12.63	13.00	13.39	13.82	14.78
HPI91709	R2.0	**4.0**	6	3	14	65	3.85	3.57	14.69	15.14	15.61	16.12	17.27
HPI91711	R2.0	**4.0**	6	3	20	65	3.85	2.60	20.90	21.55	22.26	23.02	-
HPI91712	R2.0	**4.0**	6	3	25	70	3.85	2.12	26.06	26.90	27.80	28.77	-
HPI91713	R2.0	**4.0**	6	3	30	70	3.85	1.79	31.23	32.25	33.34	-	-
HPI91714	R2.0	**4.0**	6	3	35	80	3.85	1.55	36.40	37.60	38.88	-	-
HPI91715	R2.0	**4.0**	6	3	40	85	3.85	1.36	41.57	42.95	-	-	-
HPI91716	R2.0	**4.0**	6	3	45	90	3.85	1.22	46.74	48.30	-	-	-
HPI91717	R2.0	**4.0**	6	3	50	100	3.85	1.10	51.91	53.64	-	-	-
HPI91718	R2.0	**4.0**	6	4	10	40	3.85	4.76	10.56	10.86	11.18	11.52	12.29
HPI91719	R2.0	**4.0**	6	4	10	60	3.85	4.76	10.56	10.86	11.18	11.52	12.29
HPI91050	R2.5	**5.0**	6	3.5	10	70	4.85	2.97	10.54	10.82	11.12	11.45	-
HPI91060	R3.0	**6.0**	6	6	10	70	5.85	0.00	-	-	-	-	-
HPI91720	R2.5	**5.0**	6	3.5	15	70	4.85	1.96	15.71	16.17	16.66	-	-
HPI91721	R2.5	**5.0**	6	3.5	20	70	4.85	1.46	20.88	21.52	-	-	-
HPI91722	R2.5	**5.0**	6	3.5	25	70	4.85	1.16	26.05	26.87	-	-	-
HPI91723	R2.5	**5.0**	6	3.5	30	80	4.85	0.97	31.22	-	-	-	-
HPI91724	R2.5	**5.0**	6	3.5	40	90	4.85	0.72	41.55	-	-	-	-
HPI91725	R2.5	**5.0**	6	5	12	45	4.85	2.46	12.61	12.96	13.34	13.75	-
HPI91726	R2.5	**5.0**	6	5	12	60	4.85	2.46	12.61	12.96	13.34	13.75	-
HPI91727	R3.0	**6.0**	6	6	15	45	5.85	0.00	-	-	-	-	-

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

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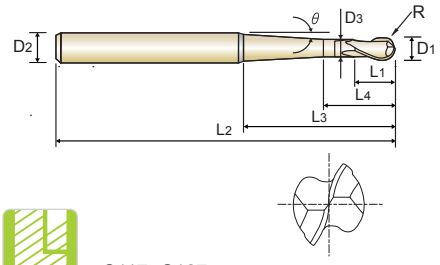

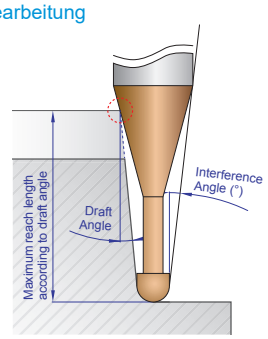

CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92901	R0.05	0.1	4	0.07	0.75	50	0.085	3°	0.17	13.88	0.37	0.44	0.58	0.76	0.81
HPI920015	R0.075	0.15	4	0.1	1	50	0.135	3°	0.25	13.55	0.46	0.55	0.71	1.00	1.08
HPI92902	R0.075	0.15	4	0.1	1.5	50	0.135	3°	0.25	12.92	0.46	0.55	0.71	1.03	1.58
HPI92002	R0.1	0.2	4	0.15	1.5	50	0.17	0.5°	0.35	12.59	1.57	1.62	1.67	1.73	1.86
HPI92903	R0.1	0.2	4	0.15	1.5	50	0.17	1°	0.35	12.64	1.53	1.58	1.63	1.69	1.82
HPI92904	R0.1	0.2	4	0.15	1.5	50	0.17	1.5°	0.35	12.69	1.33	1.54	1.59	1.64	1.77
HPI92905	R0.1	0.2	4	0.15	1.5	50	0.17	2°	0.35	12.75	1.01	1.46	1.55	1.60	1.72
HPI92906	R0.1	0.2	4	0.15	2	50	0.17	0.5°	0.35	11.93	2.07	2.13	2.21	2.29	2.46
HPI92907	R0.1	0.2	4	0.15	2	50	0.17	1°	0.35	12.00	2.01	2.08	2.15	2.23	2.40
HPI92908	R0.1	0.2	4	0.15	2	50	0.17	1.5°	0.35	12.07	1.33	2.02	2.09	2.16	2.33
HPI92909	R0.1	0.2	4	0.15	2	50	0.17	2°	0.35	12.14	1.01	1.46	2.03	2.10	2.26
HPI92910	R0.1	0.2	4	0.15	3	50	0.17	3°	0.35	11.28	0.74	0.90	1.17	1.71	3.13
HPI92911	R0.1	0.2	4	0.15	3	50	0.17	5°	0.35	11.69	0.57	0.63	0.70	0.80	1.15
HPI92912	R0.1	0.2	4	0.15	5	50	0.17	3°	0.35	9.68	0.74	0.90	1.17	1.71	5.13
HPI92913	R0.1	0.2	4	0.15	5	50	0.17	5°	0.35	10.23	0.57	0.63	0.70	0.80	1.15
HPI92003	R0.15	0.3	4	0.2	2	50	0.27	0.5°	0.5	11.92	2.07	2.14	2.21	2.29	2.46
HPI92914	R0.15	0.3	4	0.2	2	50	0.27	1°	0.5	11.99	2.02	2.08	2.15	2.23	2.40
HPI92915	R0.15	0.3	4	0.2	2	50	0.27	1.5°	0.5	12.05	1.53	2.03	2.10	2.17	2.34
HPI92916	R0.15	0.3	4	0.2	2	50	0.27	2°	0.5	12.12	1.19	1.71	2.05	2.12	2.28
HPI92917	R0.15	0.3	4	0.2	2	50	0.27	3°	0.5	12.26	0.91	1.10	1.42	2.00	2.15
HPI92918	R0.15	0.3	4	0.2	3	50	0.27	0.5°	0.5	10.77	3.07	3.17	3.28	3.40	3.66
HPI92919	R0.15	0.3	4	0.2	3	50	0.27	1°	0.5	10.86	2.57	3.08	3.19	3.30	3.56
HPI92920	R0.15	0.3	4	0.2	3	50	0.27	1.5°	0.5	10.95	1.53	2.92	3.10	3.21	3.46
HPI92921	R0.15	0.3	4	0.2	3	50	0.27	2°	0.5	11.04	1.19	1.71	3.01	3.12	3.36
HPI92922	R0.15	0.3	4	0.2	3	50	0.27	3°	0.5	11.23	0.91	1.10	1.42	2.06	3.15
HPI92923	R0.15	0.3	4	0.2	3	50	0.27	5°	0.5	11.62	0.73	0.80	0.89	1.02	1.45

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Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

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HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230	
Recommend					○			○	○		○	○										

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

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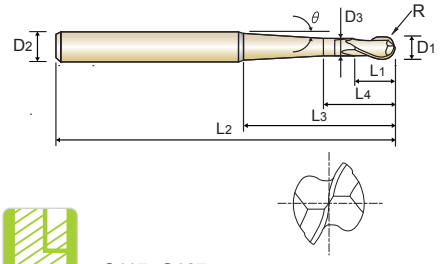

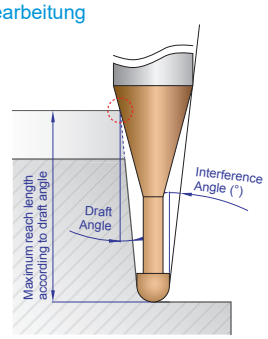

CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92948	R0.25	0.5	4	0.35	5	50	0.45	1.5°	0.85	9.06	2.58	4.91	5.17	5.35	5.77
HPI92949	R0.25	0.5	4	0.35	5	50	0.45	2°	0.85	9.18	2.00	2.88	5.02	5.20	5.60
HPI92006	R0.3	0.6	4	0.45	4	50	0.55	0.5°	1.05	9.61	4.12	4.25	4.40	4.55	4.90
HPI92950	R0.3	0.6	4	0.45	4	50	0.55	1°	1.05	9.70	4.02	4.15	4.29	4.44	4.78
HPI92951	R0.3	0.6	4	0.45	4	50	0.55	1.5°	1.05	9.79	2.86	4.05	4.18	4.33	4.66
HPI92952	R0.3	0.6	4	0.45	4	50	0.55	3°	1.05	10.08	1.77	2.14	2.75	3.98	4.30
HPI92953	R0.3	0.6	4	0.45	5	50	0.55	0.5°	1.05	8.78	5.12	5.29	5.47	5.66	6.10
HPI92954	R0.3	0.6	4	0.45	5	50	0.55	1°	1.05	8.88	4.66	5.15	5.33	5.52	5.94
HPI92955	R0.3	0.6	4	0.45	5	50	0.55	1.5°	1.05	8.98	2.86	5.01	5.18	5.37	5.78
HPI92956	R0.3	0.6	4	0.45	5	50	0.55	2°	1.05	9.09	2.25	3.23	5.04	5.22	5.62
HPI92957	R0.3	0.6	4	0.45	5	50	0.55	3°	1.05	9.31	1.77	2.14	2.75	3.98	5.30
HPI92958	R0.3	0.6	4	0.45	5	50	0.55	5°	1.05	9.79	1.45	1.59	1.78	2.02	2.88
HPI92959	R0.3	0.6	4	0.45	6	50	0.55	0.5°	1.05	8.08	6.12	6.32	6.54	6.78	7.30
HPI92960	R0.3	0.6	4	0.45	6	50	0.55	1°	1.05	8.19	4.66	6.15	6.36	6.59	7.10
HPI92961	R0.3	0.6	4	0.45	6	50	0.55	1.5°	1.05	8.30	2.86	5.41	6.18	6.41	6.90
HPI92962	R0.3	0.6	4	0.45	6	50	0.55	2°	1.05	8.41	2.25	3.23	6.01	6.22	6.70
HPI92963	R0.3	0.6	4	0.45	7	50	0.55	3°	1.05	8.08	1.77	2.14	2.75	3.98	7.30
HPI92964	R0.3	0.6	4	0.45	7	50	0.55	5°	1.05	8.63	1.45	1.59	1.78	2.02	2.88
HPI92965	R0.3	0.6	4	0.45	8	50	0.55	0.5°	1.05	6.97	8.12	8.39	8.69	9.00	9.71
HPI92966	R0.3	0.6	4	0.45	8	50	0.55	1°	1.05	7.08	4.66	8.15	8.44	8.74	9.43
HPI92967	R0.3	0.6	4	0.45	8	50	0.55	1.5°	1.05	7.20	2.86	5.41	8.18	8.48	9.14
HPI92968	R0.3	0.6	4	0.45	8	50	0.55	2°	1.05	7.32	2.25	3.23	6.16	8.22	8.86
HPI92008	R0.4	0.8	4	0.6	8	60	0.75	0.5°	1.4	6.78	8.13	8.40	8.69	9.00	9.70
HPI92969	R0.4	0.8	4	0.6	8	60	0.75	1°	1.4	6.89	5.26	8.17	8.45	8.75	9.43
HPI92970	R0.4	0.8	4	0.6	8	60	0.75	1.5°	1.4	7.01	3.33	6.26	8.21	8.50	9.16
HPI92971	R0.4	0.8	4	0.6	8	60	0.75	2°	1.4	7.12	2.69	3.83	7.26	8.26	8.89

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel					Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230	
Recommend					○			○	○		○	○										

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN mit KONISCH ABGESETZTEM SCHAFTTEIL

Fraise carbure, 2 dents, hémisphérique pour usinage de rainure avec entrée conique

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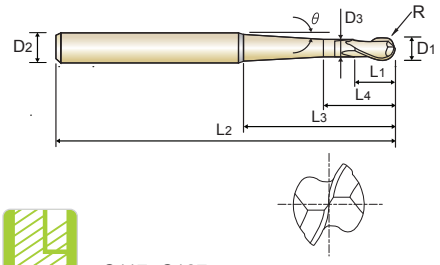
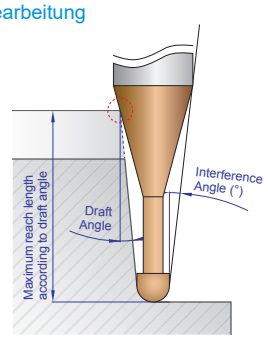
- Application of tight tolerances for precision machining.

- Verbesserung der Werkzeugstandzeit durch Aufbringen einer neuen Beschichtung
- Enge Toleranzen für die Präzisionsbearbeitung





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3	θ°	L_4		0.5°	1°	1.5°	2°	3°
HPI92997	R0.5	1.0	4	0.75	20	70	0.95	3°	2.75	3.93	3.77	4.59	5.95	8.67	20.66
HPI92998	R0.5	1.0	4	0.75	25	70	0.95	0.5°	2.75	2.91	25.17	26.03	26.95	27.95	-
HPI92999	R0.5	1.0	4	0.75	25	70	0.95	1°	2.75	2.99	7.86	25.26	26.15	27.11	-
HPI92801	R0.5	1.0	4	0.75	25	70	0.95	1.5°	2.75	3.06	5.31	10.11	25.35	26.28	28.37
HPI92802	R0.5	1.0	4	0.75	30	70	0.95	0.5°	2.75	2.50	30.17	31.21	32.31	33.51	-
HPI92803	R0.5	1.0	4	0.75	30	70	0.95	1°	2.75	2.57	7.86	30.26	31.33	32.49	-
HPI92804	R0.5	1.0	4	0.75	30	70	0.95	1.5°	2.75	2.64	5.31	10.11	30.35	31.47	-
HPI92805	R0.5	1.0	4	0.75	30	70	0.95	2°	2.75	2.71	4.45	6.43	12.36	30.44	-
HPI92896	R0.5	1.0	6	0.75	30	70	0.95	3°	2.75	4.26	3.77	4.59	5.95	8.67	30.66
HPI92015	R0.75	1.5	4	1.1	10	60	1.45	0.5°	3.1	5.18	10.18	10.50	10.86	11.24	12.09
HPI92806	R0.75	1.5	4	1.1	10	60	1.45	1°	3.1	5.27	8.31	10.26	10.61	10.98	11.81
HPI92807	R0.75	1.5	4	1.1	10	60	1.45	1.5°	3.1	5.36	5.71	10.02	10.36	10.72	11.53
HPI92808	R0.75	1.5	4	1.1	10	60	1.45	2°	3.1	5.45	4.84	6.88	10.11	10.46	11.25
HPI92809	R0.75	1.5	4	1.1	15	60	1.45	0.5°	3.1	3.84	15.18	15.68	16.22	16.80	18.10
HPI92810	R0.75	1.5	4	1.1	15	60	1.45	1°	3.1	3.92	8.31	15.26	15.79	16.35	17.62
HPI92811	R0.75	1.5	4	1.1	15	60	1.45	1.5°	3.1	4.01	5.71	10.66	15.36	15.91	17.14
HPI92812	R0.75	1.5	4	1.1	15	60	1.45	2°	3.1	4.10	4.84	6.88	13.01	15.46	16.65
HPI92813	R0.75	1.5	4	1.1	20	70	1.45	0.5°	3.1	3.05	20.18	20.85	21.58	22.36	24.11
HPI92814	R0.75	1.5	4	1.1	20	70	1.45	1°	3.1	3.12	8.31	20.26	20.97	21.73	23.43
HPI92815	R0.75	1.5	4	1.1	20	70	1.45	1.5°	3.1	3.20	5.71	10.66	20.36	21.09	22.74
HPI92816	R0.75	1.5	4	1.1	20	70	1.45	2°	3.1	3.28	4.84	6.88	13.01	20.46	22.06
HPI92817	R0.75	1.5	4	1.1	25	70	1.45	0.5°	3.1	2.53	25.18	26.03	26.94	27.92	-
HPI92818	R0.75	1.5	4	1.1	25	70	1.45	1°	3.1	2.59	8.31	25.26	26.15	27.10	-
HPI92819	R0.75	1.5	4	1.1	30	70	1.45	0.5°	3.1	2.16	30.18	31.20	32.30	33.48	-
HPI92820	R0.75	1.5	4	1.1	30	70	1.45	1°	3.1	2.22	8.31	30.26	31.33	32.48	-
HPI92020	R1.0	2.0	4	1.5	12	60	1.95	0.5°	3.5	3.93	12.18	12.57	12.99	13.44	14.45

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
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◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN mit KONISCH ABGESETZTEM SCHAFTTEIL

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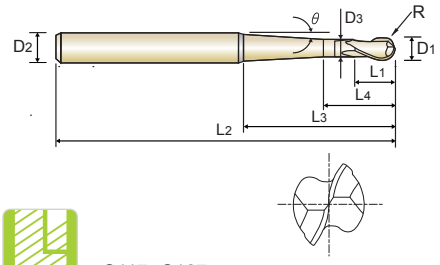

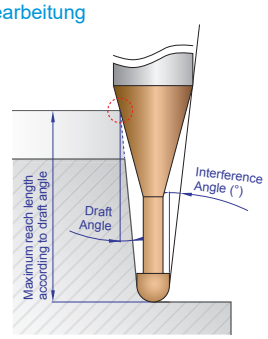

CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92848	R1.0	2.0	6	1.5	50	90	1.95	1°	3.5	2.14	8.86	50.27	52.05	53.97	-
HPI92849	R1.0	2.0	6	1.5	50	90	1.95	1.5°	3.5	2.20	6.18	11.36	50.37	52.22	-
HPI92850	R1.0	2.0	6	1.5	50	90	1.95	2°	3.5	2.27	5.29	7.43	13.86	50.48	-
HPI92030	R1.5	3.0	6	2.5	15	70	2.85	0.5°	4.5	4.51	15.39	15.87	16.39	16.95	18.21
HPI92851	R1.5	3.0	6	2.5	15	70	2.85	1°	4.5	4.59	15.04	15.51	16.01	16.56	17.78
HPI92852	R1.5	3.0	6	2.5	15	70	2.85	1.5°	4.5	4.67	10.30	15.14	15.64	16.17	17.35
HPI92853	R1.5	3.0	6	2.5	15	70	2.85	2°	4.5	4.76	8.36	11.79	15.26	15.77	16.93
HPI92854	R1.5	3.0	6	2.5	20	70	2.85	0.5°	4.5	3.60	20.39	21.05	21.75	22.51	24.22
HPI92855	R1.5	3.0	6	2.5	20	70	2.85	1°	4.5	3.67	16.09	20.51	21.19	21.93	23.59
HPI92856	R1.5	3.0	6	2.5	20	70	2.85	1.5°	4.5	3.75	10.30	19.09	20.64	21.35	22.96
HPI92857	R1.5	3.0	6	2.5	20	70	2.85	2°	4.5	3.84	8.36	11.79	20.08	20.77	22.33
HPI92858	R1.5	3.0	6	2.5	25	70	2.85	0.5°	4.5	2.99	25.39	26.22	27.12	28.08	-
HPI92859	R1.5	3.0	6	2.5	25	70	2.85	1°	4.5	3.06	16.09	25.51	26.38	27.31	29.40
HPI92860	R1.5	3.0	6	2.5	25	70	2.85	1.5°	4.5	3.14	10.30	19.09	25.64	26.54	28.57
HPI92861	R1.5	3.0	6	2.5	30	70	2.85	0.5°	4.5	2.56	30.39	31.40	32.48	33.64	-
HPI92862	R1.5	3.0	6	2.5	30	70	2.85	1°	4.5	2.63	16.09	30.51	31.56	32.68	-
HPI92863	R1.5	3.0	6	2.5	30	70	2.85	1.5°	4.5	2.69	10.30	19.09	30.64	31.73	-
HPI92864	R1.5	3.0	6	2.5	30	70	2.85	2°	4.5	2.77	8.36	11.79	22.08	30.77	-
HPI92865	R1.5	3.0	6	2.5	40	80	2.85	0.5°	4.5	1.99	40.39	41.75	43.20	-	-
HPI92866	R1.5	3.0	6	2.5	40	80	2.85	1°	4.5	2.04	16.09	40.51	41.92	43.43	-
HPI92867	R1.5	3.0	6	2.5	40	80	2.85	1.5°	4.5	2.10	10.30	19.09	40.64	42.10	-
HPI92868	R1.5	3.0	6	2.5	50	90	2.85	0.5°	4.5	1.62	50.39	52.09	53.92	-	-
HPI92869	R1.5	3.0	6	2.5	50	90	2.85	1°	4.5	1.67	16.09	50.51	52.28	-	-
HPI92870	R1.5	3.0	6	2.5	50	90	2.85	1.5°	4.5	1.72	10.30	19.09	50.64	-	-
HPI92040	R2.0	4.0	6	3	20	80	3.85	1°	5	2.72	16.59	20.51	21.18	21.90	-
HPI92871	R2.0	4.0	6	3	30	80	3.85	1°	5	1.89	16.59	30.51	31.54	-	-

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
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Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

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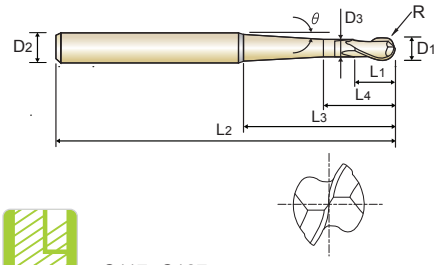

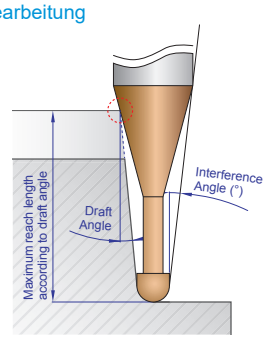

CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating

R0.05~R3 R3.5~R6

p.C117~C127

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92879	R4.0	8.0	10	14	55	115	7.7	1°	17	1.08	47.18	56.50	-	-	-
HPI92881	R4.0	8.0	10	14	70	130	7.7	1°	17	0.86	47.18	-	-	-	-
HPI92882	R4.0	8.0	10	14	120	200	7.7	0.5°	17	0.49	-	-	-	-	-
HPI92883	R4.0	8.0	12	14	80	140	7.7	1°	17	1.43	47.18	81.50	-	-	-
HPI92884	R4.0	8.0	12	14	98	200	7.7	1.5°	17	1.22	32.09	60.17	-	-	-
HPI92885	R4.0	8.0	12	14	120	200	7.7	1°	17	0.98	47.18	-	-	-	-
HPI92100	R5.0	10.0	12	18	35	105	9.7	3°	21	1.82	27.63	33.28	35.83	-	-
HPI92886	R5.0	10.0	12	18	55	125	9.7	1.5°	21	1.12	37.59	55.53	-	-	-
HPI92887	R5.0	10.0	12	18	60	130	9.7	1°	21	1.01	54.18	61.71	-	-	-
HPI92888	R5.0	10.0	12	18	65	135	9.7	1°	21	0.93	54.18	-	-	-	-
HPI92889	R5.0	10.0	12	18	75	140	9.7	1°	21	0.81	54.18	-	-	-	-
HPI92890	R5.0	10.0	12	18	86	200	9.7	1°	21	0.71	54.18	-	-	-	-
HPI92891	R5.0	10.0	12	18	120	200	9.7	0.5°	21	0.49	-	-	-	-	-
HPI92892	R5.0	10.0	16	18	120	200	9.7	1.5°	21	1.47	37.59	70.17	-	-	-
HPI92120	R6.0	12.0	16	22	60	140	11.7	3°	25	2.08	32.23	38.78	49.69	60.86	-
HPI92893	R6.0	12.0	16	22	80	160	11.7	1.5°	25	1.49	43.09	80.01	-	-	-
HPI92894	R6.0	12.0	16	22	106	200	11.7	1.5°	25	1.14	43.09	80.17	-	-	-
HPI92895	R6.0	12.0	16	22	120	200	11.7	1°	25	0.99	61.18	-	-	-	-

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20		
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230		
Recommend					○			○	○		○	○											

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI89 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, torique pour usinage de rainure
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- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.

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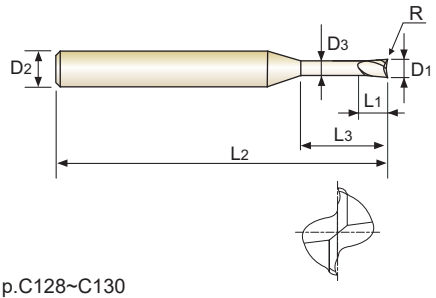

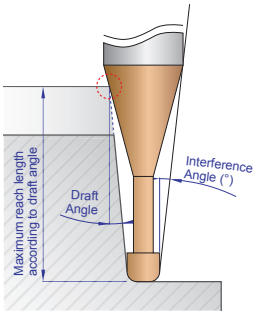

CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating

p.C128~C130

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89924	R0.02	**0.4**	4	0.3	2.5	45	0.37	11.01	2.72	2.87	3.03	3.22	3.67
HPI89925	R0.05	**0.4**	4	0.3	2.5	45	0.37	11.04	2.72	2.86	3.03	3.21	3.66
HPI89926	R0.02	**0.4**	4	0.3	3	45	0.37	10.46	3.24	3.42	3.62	3.84	4.38
HPI89927	R0.05	**0.4**	4	0.3	3	45	0.37	10.49	3.24	3.42	3.61	3.83	4.37
HPI89928	R0.1	**0.4**	4	0.3	3	45	0.37	10.54	3.24	3.41	3.61	3.82	4.35
HPI89929	R0.02	**0.4**	4	0.3	4	45	0.37	9.50	4.30	4.53	4.79	5.09	5.80
HPI89930	R0.05	**0.4**	4	0.3	4	45	0.37	9.53	4.30	4.53	4.79	5.08	5.79
HPI89931	R0.1	**0.4**	4	0.3	4	45	0.37	9.57	4.29	4.52	4.78	5.07	5.77
HPI89005	R0.02	**0.5**	4	0.4	1	45	0.45	12.96	1.20	1.27	1.34	1.42	1.62
HPI89932	R0.05	**0.5**	4	0.4	1	45	0.45	13.01	1.20	1.26	1.33	1.41	1.60
HPI89933	R0.1	**0.5**	4	0.4	1	45	0.45	13.09	1.20	1.26	1.32	1.40	1.58
HPI89934	R0.02	**0.5**	4	0.4	2	45	0.45	11.50	2.25	2.37	2.51	2.67	3.04
HPI89935	R0.05	**0.5**	4	0.4	2	45	0.45	11.54	2.25	2.37	2.51	2.66	3.03
HPI89936	R0.1	**0.5**	4	0.4	2	45	0.45	11.60	2.25	2.37	2.50	2.65	3.01
HPI89937	R0.02	**0.5**	4	0.4	3	45	0.45	10.33	3.30	3.48	3.69	3.91	4.46
HPI89938	R0.05	**0.5**	4	0.4	3	45	0.45	10.36	3.30	3.48	3.68	3.91	4.45
HPI89939	R0.1	**0.5**	4	0.4	3	45	0.45	10.41	3.30	3.48	3.67	3.89	4.43
HPI89940	R0.02	**0.5**	4	0.4	4	45	0.45	9.37	4.36	4.59	4.86	5.16	5.88
HPI89941	R0.05	**0.5**	4	0.4	4	45	0.45	9.40	4.35	4.59	4.86	5.15	5.87
HPI89942	R0.1	**0.5**	4	0.4	4	45	0.45	9.44	4.35	4.59	4.85	5.14	5.85
HPI89943	R0.02	**0.5**	4	0.4	5	45	0.45	8.58	5.41	5.70	6.04	6.41	7.31
HPI89944	R0.05	**0.5**	4	0.4	5	45	0.45	8.60	5.41	5.70	6.03	6.40	7.30
HPI89945	R0.1	**0.5**	4	0.4	5	45	0.45	8.63	5.40	5.70	6.02	6.39	7.27
HPI89946	R0.02	**0.5**	4	0.4	6	45	0.45	7.90	6.46	6.81	7.21	7.65	8.73
HPI89948	R0.1	**0.5**	4	0.4	6	45	0.45	7.95	6.46	6.81	7.20	7.63	8.70
HPI89006	R0.02	**0.6**	4	0.5	2	45	0.55	11.42	2.25	2.37	2.51	2.67	3.04

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI89 SERIES**

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VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, torique pour usinage de rainure
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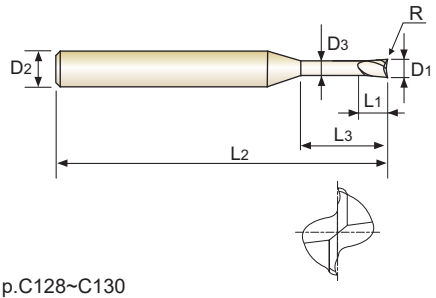

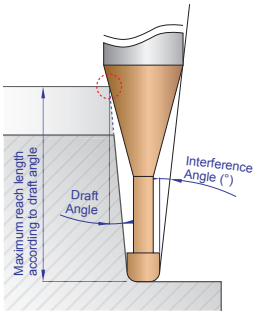

CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating

p.C128~C130

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89974	R0.02	0.8	4	0.65	4	45	0.75	9.05	4.36	4.59	4.86	5.16	5.88
HPI89975	R0.05	0.8	4	0.65	4	45	0.75	9.08	4.35	4.59	4.86	5.15	5.87
HPI89976	R0.1	0.8	4	0.65	4	45	0.75	9.12	4.35	4.59	4.85	5.14	5.85
HPI89977	R0.2	0.8	4	0.65	4	45	0.75	9.21	4.35	4.57	4.83	5.12	5.81
HPI89978	R0.02	0.8	4	0.65	6	45	0.75	7.57	6.46	6.81	7.21	7.65	8.73
HPI89979	R0.05	0.8	4	0.65	6	45	0.75	7.59	6.46	6.81	7.20	7.65	8.72
HPI89980	R0.1	0.8	4	0.65	6	45	0.75	7.62	6.46	6.81	7.20	7.63	8.70
HPI89981	R0.2	0.8	4	0.65	6	45	0.75	7.68	6.45	6.79	7.18	7.61	8.65
HPI89982	R0.02	0.8	4	0.65	8	50	0.75	6.50	8.56	9.03	9.56	10.15	11.29
HPI89983	R0.05	0.8	4	0.65	8	50	0.75	6.51	8.56	9.03	9.55	10.14	11.29
HPI89984	R0.1	0.8	4	0.65	8	50	0.75	6.54	8.56	9.03	9.54	10.13	11.28
HPI89985	R0.2	0.8	4	0.65	8	50	0.75	6.58	8.56	9.01	9.53	10.10	11.26
HPI89986	R0.05	0.8	4	0.65	12	50	0.75	5.08	12.77	13.47	14.25	15.11	15.96
HPI89987	R0.1	0.8	4	0.65	12	50	0.75	5.09	12.77	13.46	14.24	15.11	15.95
HPI89988	R0.2	0.8	4	0.65	12	50	0.75	5.12	12.76	13.45	14.22	15.09	15.93
HPI89009	R0.1	0.9	4	0.7	4	45	0.85	9.01	4.35	4.59	4.85	5.14	5.85
HPI89989	R0.1	0.9	4	0.7	8	50	0.85	6.42	8.56	9.03	9.54	10.13	11.22
HPI89991	R0.1	1.0	4	0.8	6	50	0.95	7.37	6.46	6.81	7.20	7.63	8.70
HPI89992	R0.2	1.0	4	0.8	6	50	0.95	7.44	6.45	6.79	7.18	7.61	8.65
HPI89993	R0.3	1.0	4	0.8	6	50	0.95	7.50	6.45	6.78	7.16	7.58	8.61
HPI89994	R0.1	1.0	4	0.8	8	50	0.95	6.30	8.56	9.03	9.54	10.13	11.16
HPI89995	R0.2	1.0	4	0.8	8	50	0.95	6.34	8.56	9.01	9.53	10.10	11.15
HPI89996	R0.1	1.0	4	0.8	10	50	0.95	5.50	10.66	11.25	11.89	12.62	13.50
HPI89997	R0.2	1.0	4	0.8	10	50	0.95	5.53	10.66	11.23	11.88	12.60	13.48
HPI89998	R0.3	1.0	4	0.8	10	50	0.95	5.57	10.65	11.22	11.86	12.57	13.47
HPI89999	R0.1	1.0	4	0.8	12	55	0.95	4.87	12.77	13.46	14.24	15.00	15.84

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Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

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ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI89 SERIES**

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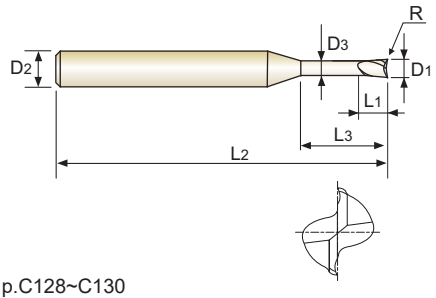
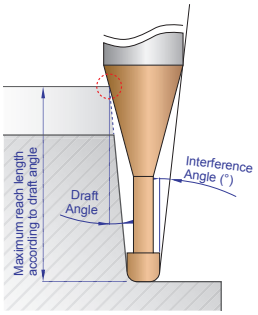




CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating

p.C128~C130

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI89826	R0.2	**2.0**	4	1.7	16	55	1.95	2.92	16.63	17.20	17.81	18.48	-
HPI89827	R0.3	**2.0**	4	1.7	16	55	1.95	2.93	16.62	17.19	17.80	18.46	-
HPI89828	R0.5	**2.0**	4	1.7	16	55	1.95	2.96	16.62	17.18	17.78	18.43	-
HPI89829	R0.8	**2.0**	4	1.7	16	55	1.95	3.01	16.61	17.16	17.75	18.39	19.81
HPI89830	R0.2	**2.0**	4	1.7	20	60	1.95	2.42	20.76	21.48	22.25	23.07	-
HPI89831	R0.3	**2.0**	4	1.7	20	60	1.95	2.43	20.76	21.47	22.24	23.06	-
HPI89832	R0.5	**2.0**	4	1.7	20	60	1.95	2.45	20.75	21.46	22.22	23.03	-
HPI89833	R0.8	**2.0**	4	1.7	20	60	1.95	2.49	20.74	21.44	22.18	22.98	-
HPI89834	R0.2	**2.0**	4	1.7	25	65	1.95	2.00	25.93	26.83	27.79	28.82	-
HPI89835	R0.5	**2.0**	4	1.7	25	65	1.95	2.02	25.92	26.81	27.76	28.78	-
HPI89836	R0.2	**2.0**	4	1.7	30	70	1.95	1.70	31.10	32.18	33.33	-	-
HPI89837	R0.5	**2.0**	4	1.7	30	70	1.95	1.72	31.09	32.16	33.30	-	-
HPI89030	R0.2	**3.0**	6	2.5	8	55	2.85	6.26	8.55	8.84	9.16	9.49	10.24
HPI89840	R0.2	**3.0**	6	2.5	12	60	2.85	4.85	12.69	13.12	13.59	14.09	15.22
HPI89841	R0.5	**3.0**	6	2.5	12	60	2.85	4.93	12.68	13.10	13.56	14.05	15.14
HPI89842	R0.2	**3.0**	6	2.5	16	60	2.85	3.96	16.82	17.40	18.02	18.69	20.19
HPI89843	R0.3	**3.0**	6	2.5	16	60	2.85	3.98	16.82	17.39	18.01	18.67	20.17
HPI89844	R0.5	**3.0**	6	2.5	16	60	2.85	4.01	16.81	17.38	17.99	18.64	20.12
HPI89845	R0.2	**3.0**	6	2.5	20	65	2.85	3.34	20.96	21.68	22.45	23.29	25.16
HPI89846	R0.3	**3.0**	6	2.5	20	65	2.85	3.36	20.95	21.67	22.44	23.27	25.14

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

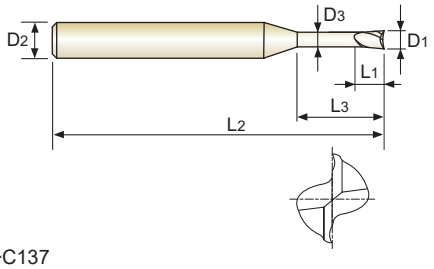
PLAIN SHANK **HPI88 SERIES**

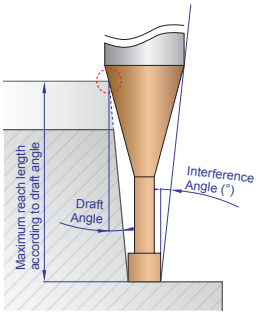
CARBIDE, 2 FLUTE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN für SCHMALE RIPPEN
Fraise carbure, 2 dents pour usinage de rainure
2 TAGLIENTI, SCARICATA PER NERVATURE

- Improvement of tool life by applying new coating.
- Application of tight tolerances for precision machining.

- Verbesserung der Werkzeugstandzeit durch Aufbringen einer neuen Beschichtung
- Enge Toleranzen für die Präzisionsbearbeitung





CARBIDE | 2 | 35° | PLAIN | C Coating

p.C131~C137

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88001	0.1	4	0.08	0.3	45	0.085	14.38	0.36	0.38	0.40	0.43	0.49
HPI88901	0.1	4	0.08	0.5	45	0.085	14.03	0.57	0.60	0.64	0.68	0.77
HPI88902	0.1	4	0.08	0.75	45	0.085	13.61	0.83	0.88	0.93	0.99	1.13
HPI88903	0.1	4	0.08	1	45	0.085	13.21	1.10	1.16	1.22	1.30	1.48
HPI880015	0.15	4	0.12	0.3	45	0.135	14.37	0.36	0.38	0.40	0.43	0.49
HPI88904	0.15	4	0.12	0.5	45	0.135	14.01	0.57	0.60	0.64	0.68	0.77
HPI88905	0.15	4	0.12	0.75	45	0.135	13.59	0.83	0.88	0.93	0.99	1.13
HPI88906	0.15	4	0.12	1	45	0.135	13.19	1.10	1.16	1.22	1.30	1.48
HPI88907	0.15	4	0.12	1.5	45	0.135	12.46	1.62	1.71	1.81	1.92	2.19
HPI88908	0.2	4	0.15	0.75	45	0.17	13.53	0.88	0.93	0.98	1.04	1.19
HPI88909	0.2	4	0.15	1	45	0.17	13.13	1.14	1.20	1.27	1.35	1.54
HPI88910	0.2	4	0.15	1.5	45	0.17	12.39	1.67	1.76	1.86	1.98	2.26
HPI88911	0.2	4	0.15	2	45	0.17	11.73	2.19	2.31	2.45	2.60	2.97
HPI88912	0.2	4	0.15	2.5	45	0.17	11.14	2.72	2.87	3.04	3.22	3.68
HPI88913	0.2	4	0.15	3	45	0.17	10.61	3.25	3.42	3.62	3.85	4.39
HPI88003	0.3	4	0.25	1	45	0.27	13.08	1.14	1.20	1.27	1.35	1.54
HPI88914	0.3	4	0.25	1.5	45	0.27	12.33	1.67	1.76	1.86	1.98	2.26
HPI88915	0.3	4	0.25	2	45	0.27	11.67	2.19	2.31	2.45	2.60	2.97
HPI88916	0.3	4	0.25	2.5	45	0.27	11.06	2.72	2.87	3.04	3.22	3.68
HPI88917	0.3	4	0.25	3	45	0.27	10.52	3.25	3.42	3.62	3.85	4.39
HPI88004	0.4	4	0.3	1	45	0.37	13.04	1.14	1.20	1.27	1.35	1.54
HPI88918	0.4	4	0.3	1.5	45	0.37	12.27	1.67	1.76	1.86	1.98	2.26
HPI88919	0.4	4	0.3	2	45	0.37	11.59	2.19	2.31	2.45	2.60	2.97
HPI88920	0.4	4	0.3	2.5	45	0.37	10.98	2.72	2.87	3.04	3.22	3.68
HPI88921	0.4	4	0.3	3	45	0.37	10.44	3.25	3.42	3.62	3.85	4.39
HPI88922	0.4	4	0.3	3.5	45	0.37	9.94	3.77	3.98	4.21	4.47	5.10

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K						
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel					Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20		
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230		
Recommend					○			○	○		○	○											

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN für SCHMALE RIPPEN
Fraise carbure, 2 dents pour usinage de rainure
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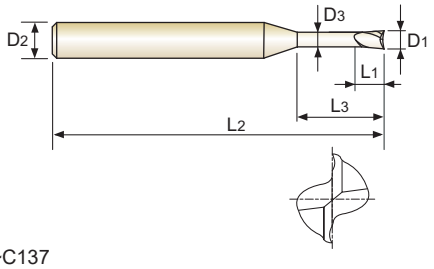

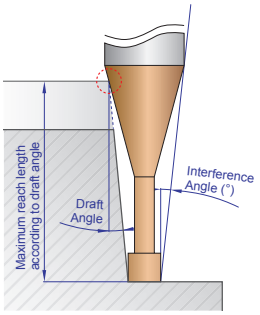

CARBIDE | 2 | 35° | PLAIN | C Coating

p.C131~C137

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI88946	0.7	4	0.55	4	45	0.65	9.14	4.36	4.60	4.86	5.16	5.89
HPI88947	0.7	4	0.55	6	45	0.65	7.67	6.46	6.82	7.21	7.66	8.74
HPI88948	0.7	4	0.55	8	50	0.65	6.60	8.57	9.04	9.56	10.15	11.35
HPI88949	0.7	4	0.55	10	50	0.65	5.80	10.67	11.26	11.91	12.65	13.69
HPI88008	0.8	4	0.65	3	45	0.75	10.01	3.31	3.49	3.69	3.92	4.47
HPI88950	0.8	4	0.65	4	45	0.75	9.03	4.36	4.60	4.86	5.16	5.89
HPI88951	0.8	4	0.65	5	45	0.75	8.23	5.41	5.71	6.04	6.41	7.32
HPI88952	0.8	4	0.65	6	45	0.75	7.55	6.46	6.82	7.21	7.66	8.74
HPI88953	0.8	4	0.65	8	50	0.75	6.49	8.57	9.04	9.56	10.15	11.29
HPI88954	0.8	4	0.65	10	50	0.75	5.69	10.67	11.26	11.91	12.65	13.63
HPI88955	0.8	4	0.65	12	50	0.75	5.06	12.77	13.48	14.26	15.12	15.97
HPI88010	1.0	4	0.8	2	50	0.95	11.04	2.25	2.38	2.52	2.67	3.05
HPI88956	1.0	4	0.8	3	50	0.95	9.79	3.31	3.49	3.69	3.92	4.47
HPI88957	1.0	4	0.8	4	50	0.95	8.80	4.36	4.60	4.86	5.16	5.89
HPI88958	1.0	4	0.8	5	50	0.95	7.99	5.41	5.71	6.04	6.41	7.32
HPI88959	1.0	4	0.8	6	50	0.95	7.31	6.46	6.82	7.21	7.66	8.74
HPI88960	1.0	4	0.8	7	50	0.95	6.74	7.51	7.93	8.39	8.91	10.01
HPI88961	1.0	4	0.8	8	50	0.95	6.25	8.57	9.04	9.56	10.15	11.18
HPI88962	1.0	4	0.8	9	50	0.95	5.83	9.62	10.15	10.74	11.40	12.35
HPI88963	1.0	4	0.8	10	50	0.95	5.46	10.67	11.26	11.91	12.65	13.52
HPI88964	1.0	4	0.8	12	50	0.95	4.85	12.77	13.48	14.26	15.01	15.85
HPI88965	1.0	4	0.8	14	50	0.95	4.36	14.88	15.70	16.61	17.22	18.19
HPI88966	1.0	4	0.8	16	60	0.95	3.96	16.98	17.92	18.93	19.43	20.53
HPI88967	1.0	4	0.8	18	60	0.95	3.62	19.09	20.13	21.09	21.65	22.86
HPI88968	1.0	4	0.8	20	60	0.95	3.34	21.19	22.35	23.24	23.86	25.20
HPI88969	1.0	4	0.8	22	60	0.95	3.10	23.29	24.57	25.40	26.07	27.53

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN für SCHMALE RIPPEN
Fraise carbure, 2 dents pour usinage de rainure
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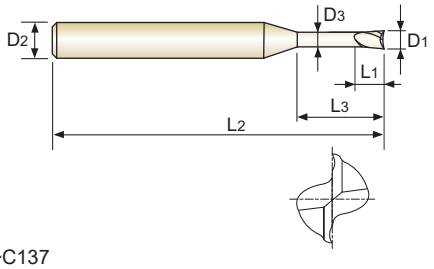
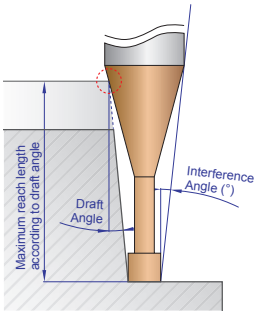




CARBIDE | 2 | 35° | PLAIN | C Coating

p.C131~C137

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle(°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88991	1.8	4	1.4	16	60	1.75	3.12	16.64	17.21	17.84	18.50	20.01
HPI88992	1.8	4	1.4	18	60	1.75	2.84	18.70	19.35	20.05	20.80	-
HPI88020	2.0	4	1.6	4	50	1.95	7.28	4.23	4.38	4.54	4.71	5.09
HPI88993	2.0	4	1.6	6	50	1.95	5.81	6.30	6.52	6.75	7.01	7.57
HPI88994	2.0	4	1.6	8	50	1.95	4.83	8.37	8.66	8.97	9.31	10.06
HPI88995	2.0	4	1.6	10	50	1.95	4.14	10.43	10.80	11.19	11.61	12.55
HPI88996	2.0	4	1.6	12	50	1.95	3.62	12.50	12.94	13.40	13.91	15.03
HPI88997	2.0	4	1.6	14	60	1.95	3.21	14.57	15.08	15.62	16.21	17.52
HPI88998	2.0	4	1.6	16	60	1.95	2.89	16.64	17.21	17.84	18.50	-
HPI88999	2.0	4	1.6	18	60	1.95	2.62	18.70	19.35	20.05	20.80	-
HPI88801	2.0	4	1.6	20	60	1.95	2.40	20.77	21.49	22.27	23.10	-
HPI88802	2.0	4	1.6	25	70	1.95	1.99	25.94	26.84	27.81	-	-
HPI88803	2.0	4	1.6	30	70	1.95	1.69	31.11	32.19	33.35	-	-
HPI88804	2.0	4	1.6	35	80	1.95	1.48	36.27	37.54	-	-	-
HPI88805	2.0	4	1.6	40	90	1.95	1.31	41.44	42.89	-	-	-
HPI88806	2.0	4	1.6	50	100	1.95	1.06	51.78	53.58	-	-	-
HPI88025	2.5	4	2	8	50	2.4	3.91	8.46	8.76	9.07	9.41	10.18
HPI88807	2.5	4	2	12	50	2.4	2.87	12.60	13.04	13.51	14.01	-
HPI88808	2.5	4	2	16	60	2.4	2.26	16.73	17.31	17.94	18.61	-
HPI88809	2.5	4	2	20	60	2.4	1.87	20.87	21.59	22.37	-	-
HPI88810	2.5	4	2	30	70	2.4	1.30	31.20	32.29	-	-	-
HPI88811	2.5	4	2	40	90	2.4	1.00	41.54	-	-	-	-
HPI88812	2.5	4	2	50	100	2.4	0.81	51.88	-	-	-	-
HPI88030	3.0	6	4.5	8	50	2.85	6.17	8.56	8.86	9.18	9.52	10.29
HPI88813	3.0	6	4.5	12	50	2.85	4.80	12.69	13.14	13.61	14.12	15.27
HPI88814	3.0	6	4.5	16	60	2.85	3.92	16.83	17.41	18.04	18.72	20.24

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel			High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommend																		◎	◎	◎	◎	◎	○	◎

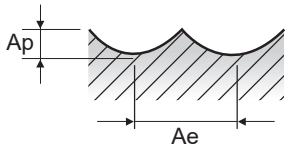
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

HPI90 SERIES — **2 FLUTE BALL NOSE**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Para meter	Diameter (Ø)																	
						0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	5	Non-alloy steel	0.05D	0.02D	Vc	31	46	67	82	98	129	160	242	319	320	319	324	299	268	288	299	268	288	288
					fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048	0.054	0.057	0.074	0.091	0.120	0.156	0.174	0.189	0.199	0.212	0.238	0.264
					RPM	49178	49178	53277	52458	51911	51228	50818	51365	50818	40685	33879	25819	19016	14207	11475	9508	7104	5737	4590
					FEED	1180	1475	2025	2518	3011	3995	4878	5548	5794	5979	6166	6196	5933	4944	4337	3784	3012	2732	2424
	8~9	Low alloy steel	0.05D	0.02D	Vc	31	46	67	82	98	129	160	242	319	320	319	324	299	268	288	299	268	288	288
					Fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048	0.054	0.057	0.074	0.091	0.120	0.156	0.174	0.189	0.199	0.212	0.238	0.264
					RPM	49178	49178	53277	52458	51911	51228	50818	51365	50818	40685	33879	25819	19016	14207	11475	9508	7104	5737	4590
					FEED	1180	1475	2025	2518	3011	3995	4878	5548	5794	5979	6166	6196	5933	4944	4337	3784	3012	2732	2424
	11.1	High alloyed steel, and tool steel	0.05D	0.02D	Vc	31	46	67	82	98	129	160	242	319	320	319	324	299	268	288	299	268	288	288
					fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048	0.054	0.057	0.074	0.091	0.120	0.156	0.174	0.189	0.199	0.212	0.238	0.264
					RPM	49178	49178	53277	52458	51911	51228	50818	51365	50818	40685	33879	25819	19016	14207	11475	9508	7104	5737	4590
					FEED	1180	1475	2025	2518	3011	3995	4878	5548	5794	5979	6166	6196	5933	4944	4337	3784	3012	2732	2424
	11.2		0.05D	0.02D	Vc	31	46	67	82	98	129	160	232	309	309	309	309	288	263	278	288	257	278	278
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042	0.047	0.050	0.066	0.083	0.111	0.138	0.153	0.164	0.174	0.187	0.206	0.227
					RPM	49178	49178	53277	52458	51911	51228	50818	49178	49178	39295	32786	24589	18360	13934	11065	9180	6830	5532	4426
					FEED	1082	1377	1812	2203	2596	3381	4268	4623	4918	5180	5443	5459	5068	4264	3630	3195	2554	2279	2010
H	38.1	Hardened steel	0.05D	0.02D	Vc	31	46	67	82	98	129	160	232	309	309	309	309	288	263	278	288	257	278	278
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042	0.047	0.050	0.066	0.083	0.111	0.138	0.153	0.164	0.174	0.187	0.206	0.227
					RPM	49178	49178	53277	52458	51911	51228	50818	49178	49178	39295	32786	24589	18360	13934	11065	9180	6830	5532	4426
					FEED	1082	1377	1812	2203	2596	3381	4268	4623	4918	5180	5443	5459	5068	4264	3630	3195	2554	2279	2010
	38.2		0.05D	0.02D	Vc	29	41	57	72	88	118	144	211	258	257	258	257	242	211	232	242	216	232	232
					fz	0.010	0.013	0.017	0.021	0.024	0.033	0.042	0.047	0.050	0.063	0.075	0.100	0.125	0.141	0.150	0.160	0.170	0.189	0.208
					RPM	45900	43714	45081	45900	46447	47130	45900	44807	40983	32754	27322	20491	15410	11202	9221	7704	5737	4610	3688
					FEED	918	1136	1533	1928	2230	3111	3855	4212	4098	4098	4098	4098	3852	3159	2767	2466	1951	1743	1535
	39.1		0.05D	0.02D	Vc	26	41	52	67	77	103	129	180	227	227	227	227	216	196	206	211	196	206	206
					fz	0.010	0.012	0.015	0.019	0.023	0.030	0.038	0.042	0.045	0.056	0.067	0.090	0.113	0.125	0.134	0.144	0.155	0.169	0.188
					RPM	40983	43714	40983	42621	40983	40983	40983	38250	36064	28840	24043	18032	13770	10382	8197	6721	5191	4098	3278
					FEED	820	1050	1230	1619	1885	2459	3115	3213	3246	3233	3222	3246	3112	2596	2197	1935	1609	1385	1233
	39.2		0.05D	0.02D	Vc	21	36	46	57	67	93	113	160	206	206	206	206	185	170	180	185	170	180	180
					fz	0.010	0.012	0.015	0.019	0.023	0.030	0.037	0.041	0.044	0.055	0.067	0.088	0.111	0.122	0.132	0.142	0.142	0.143	0.143
					RPM	32786	38250	36884	36064	35519	36884	36064	33879	32786	26265	21858	16392	11803	9017	7172	5902	4508	3586	2869
					FEED	656	918	1106	1371	1634	2213	2669	2778	2885	2907	2929	2885	2620	2200	1893	1676	1280	1026	821
	39.3		0.05D	0.02D	Vc	21	31	41	52	62	82	113	144	185	185	185	185	170	155	170	170	154	165	165
					fz	0.009	0.011	0.014	0.017	0.022	0.029	0.033	0.039	0.040	0.051	0.061	0.079	0.100	0.109	0.119	0.130	0.131	0.133	0.129
					RPM	32786	32786	32786	32786	32786	32786	36064	30600	29507	23587	19672	14754	10819	8197	6762	5410	4098	3278	2622
					FEED	590	721	918	1114	1443	1901	2380	2387	2361	2380	2400	2331	2164	1787	1609	1407	1073	872	677
	40	Chilled Cast Iron	0.05D	0.02D	Vc	31	46	67	82	98	129	160	232	309	309	309	309	288	263	278	288	257	278	278
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042	0.047	0.050	0.066	0.083	0.111	0.138	0.153	0.164	0.174	0.187	0.206	0.227
					RPM	49178	49178	53277	52458	51911	51228	50818	49178	49178	39295	32786	24589	18360	13934	11065	9180	6830	5532	4426
					FEED	1082	1377	1812	2203	2596	3381	4268	4623	4918	5180	5443	5459	5068	4264	3630	3195	2554	2279	2010
	41	Hardened Cast Iron	0.05D	0.02D	Vc	29	41	57	72	88	118	144	211	258	257	258	257	242	211	232	242	216	232	232
					fz	0.010	0.013	0.017	0.021	0.024	0.033	0.042	0.047	0.050	0.063	0.075	0.100	0.125	0.141	0.150	0.160	0.170	0.189	0.208
					RPM	45900	43714	45081	45900	46447	47130	45900	44807	40983	32754	27322	20491	15410	11202	9221	7704	5737	4610	3688
					FEED	918	1136	1533	1928	2230	3111	3855	4212	4098	4098	4098	4098	3852	3159	2767	2466	1951	1743	1535



X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
			LBS	2	2.25	2.5	3	3.5	4	5	7	0.5	0.8	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	1
P	5	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.014	0.014	0.014	0.014	0.012	0.012	0.011	0.009	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.024
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1239	1239	1239	1239	944	944	649	266	2025	2025	2025	2025	2025	1630	1630	1630	1630	1279	1279	1279	831	2518
		Ap	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.002	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.010
	8-9	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.014	0.014	0.014	0.014	0.012	0.012	0.011	0.009	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.024
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1239	1239	1239	1239	944	944	649	266	2025	2025	2025	2025	2025	1630	1630	1630	1630	1279	1279	1279	831	2518
		Ap	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.002	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.010
	11.1	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.014	0.014	0.014	0.014	0.012	0.012	0.011	0.009	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.024
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1239	1239	1239	1239	944	944	649	266	2025	2025	2025	2025	2025	1630	1630	1630	1630	1279	1279	1279	831	2518
		Ap	0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.002	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.010
	11.2	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.013	0.013	0.013	0.013	0.011	0.011	0.010	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1151	1151	1151	1151	866	866	590	236	1811	1811	1811	1811	1811	1438	1438	1438	1438	1193	1193	1193	767	2203
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009
H	38.1	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.013	0.013	0.013	0.013	0.011	0.011	0.010	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1151	1151	1151	1151	866	866	590	236	1811	1811	1811	1811	1811	1438	1438	1438	1438	1193	1193	1193	767	2203
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009
	38.2	Vc	37	37	37	37	33	33	25	12	57	57	57	57	57	51	51	51	51	45	45	45	34	72
		fz	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	39343	39343	39343	39343	34971	34971	26228	13114	45081	45081	45081	45081	45081	40573	40573	40573	40573	36065	36065	36065	27049	45900
		FEED	944	944	944	944	699	699	472	210	1533	1533	1533	1533	1533	1217	1217	1217	1217	1010	1010	1010	649	1928
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009
	39.1	Vc	37	37	37	37	33	33	25	12	52	52	52	52	52	46	46	46	46	41	41	41	31	67
		fz	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.007	0.015	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.014	0.012	0.012	0.012	0.011	0.019
		RPM	39343	39343	39343	39343	34971	34971	26228	13114	40983	40983	40983	40983	40983	36885	36885	36885	36885	32786	32786	32786	24590	42621
		FEED	866	866	866	866	699	699	420	184	1229	1229	1229	1229	1229	1033	1033	1033	1033	787	787	787	541	1620
		Ap	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.001	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.008
	39.2	Vc	32	32	32	32	29	29	22	11	46	46	46	46	46	42	42	42	42	37	37	37	28	57
		fz	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.007	0.015	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.014	0.012	0.012	0.012	0.011	0.019
		RPM	34425	34425	34425	34425	30600	30600	22950	11475	36884	36884	36884	36884	36884	33196	33196	33196	33196	29507	29507	29507	22130	36064
		FEED	757	757	757	757	612	612	367	161	1107	1107	1107	1107	1107	929	929	929	929	708	708	708	487	1370
		Ap	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.001	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.008
	39.3	Vc	28	28	28	28	25	25	19	9	41	41	41	41	41	37	37	37	37	33	33	33	25	52
		fz	0.010	0.010	0.010	0.010	0.009	0.009	0.008	0.007	0.014	0.014	0.014	0.014	0.014	0.013	0.013	0.013	0.013	0.011	0.011	0.011	0.010	0.017
		RPM	29507	29507	29507	29507	26229	26229	19672	9836	32786	32786	32786	32786	32786	29507	29507	29507	29507	26229	26229	26229	19672	32786
		FEED	590	590	590	590	472	472	315	138	918	918	918	918	918	767	767	767	767	577	577	577	393	1115
		Ap	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.001	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.007
	40	Vc	42	42	42	42	37	37	28	14	67	67	67	67	67	60	60	60	60	54	54	54	40	82
		fz	0.013	0.013	0.013	0.013	0.011	0.011	0.010	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	44260	44260	44260	44260	39342	39342	29507	14753	53277	53277	53277	53277	53277	47949	47949	47949	47949	42622	42622	42622	31966	52458
		FEED	1151	1151	1151	1151	866	866	590	236	1811	1811	1811	1811	1811	1438	1438	1438	1438	1193	1193	1193	767	2203
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009
	41	Vc	37	37	37	37	33	33	25	12	57	57	57	57	57	51	51	51	51	45	45	45	34	72
		fz	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.008	0.017	0.017	0.017	0.017	0.017	0.015	0.015	0.015	0.015	0.014	0.014	0.014	0.012	0.021
		RPM	39343	39343	39343	39343	34971	34971	26228	13114	45081	45081	45081	45081	45081	40573	40573	40573	40573	36065	36065	36065	27049	45900
		FEED	944	944	944	944	699	699	472	210	1533	1533	1533	1533	1533	1217	1217	1217	1217	1010	1010	1010	649	1928
		Ap	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.009

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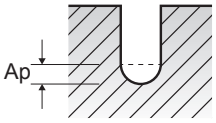

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9
			LBS	5	5.5	6	7	8	9	10	12	2	4	6	8	2	3	4	5	6	7	8	10	12	2
P	5	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020	0.029	0.026	0.026	0.023	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.031	0.031	0.039
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2429	2429	2429	1910	1910	1910	1246	1246	3011	2429	2429	1910	3996	3996	3996	3227	3227	3227	3227	2541	2541	3996
		Ap	0.008	0.008	0.008	0.008	0.008	0.008	0.006	0.006	0.014	0.011	0.010	0.010	0.016	0.014	0.014	0.013	0.013	0.011	0.011	0.011	0.010	0.018
	8-9	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020	0.029	0.026	0.026	0.023	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.031	0.031	0.039
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2429	2429	2429	1910	1910	1910	1246	1246	3011	2429	2429	1910	3996	3996	3996	3227	3227	3227	3227	2541	2541	3996
		Ap	0.008	0.008	0.008	0.008	0.008	0.008	0.006	0.006	0.014	0.011	0.010	0.010	0.016	0.014	0.014	0.013	0.013	0.011	0.011	0.011	0.010	0.018
	11.1	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020	0.029	0.026	0.026	0.023	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.031	0.031	0.039
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2429	2429	2429	1910	1910	1910	1246	1246	3011	2429	2429	1910	3996	3996	3996	3227	3227	3227	3227	2541	2541	3996
		Ap	0.008	0.008	0.008	0.008	0.008	0.008	0.006	0.006	0.014	0.011	0.010	0.010	0.016	0.014	0.014	0.013	0.013	0.011	0.011	0.011	0.010	0.018
	11.2	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.023	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.025	0.023	0.023	0.020	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2149	2149	2149	1661	1661	1661	1121	1121	2596	2149	2149	1661	3381	3381	3381	2766	2766	2766	2766	2131	2131	3381
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015
H	38.1	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.023	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.025	0.023	0.023	0.020	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2149	2149	2149	1661	1661	1661	1121	1121	2596	2149	2149	1661	3381	3381	3381	2766	2766	2766	2766	2131	2131	3381
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015
	38.2	Vc	79	79	79	70	70	70	53	53	102	92	92	82	118	118	118	107	107	107	107	95	95	133
		fz	0.022	0.022	0.022	0.019	0.019	0.019	0.017	0.017	0.024	0.022	0.022	0.019	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	41802	41802	41802	37158	37158	37158	27868	27868	46447	41802	41802	37158	47130	47130	47130	42417	42417	42417	42417	37704	37704	47130
		FEED	1839	1839	1839	1412	1412	1412	948	948	2229	1839	1839	1412	3111	3111	3111	2545	2545	2545	2545	1961	1961	3111
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015
	39.1	Vc	70	70	70	62	62	62	46	46	90	81	81	72	103	103	103	93	93	93	93	82	82	116
		fz	0.021	0.021	0.021	0.018	0.018	0.018	0.016	0.016	0.023	0.021	0.021	0.018	0.030	0.030	0.030	0.027	0.027	0.027	0.027	0.024	0.024	0.030
		RPM	36885	36885	36885	32786	32786	32786	24590	24590	40983	36885	36885	32786	40983	40983	40983	36885	36885	36885	36885	32786	32786	40983
		FEED	1549	1549	1549	1180	1180	1180	787	787	1885	1549	1549	1180	2459	2459	2459	1992	1992	1992	1992	1574	1574	2459
		Ap	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.011	0.009	0.008	0.008	0.013	0.012	0.012	0.010	0.010	0.009	0.009	0.009	0.008	0.014
	39.2	Vc	60	60	60	54	54	54	40	40	78	70	70	62	93	93	93	83	83	83	83	74	74	104
		fz	0.021	0.021	0.021	0.018	0.018	0.018	0.016	0.016	0.023	0.021	0.021	0.018	0.030	0.030	0.030	0.027	0.027	0.027	0.027	0.024	0.024	0.030
		RPM	31967	31967	31967	28415	28415	28415	21311	21311	35519	31967	31967	28415	36884	36884	36884	33196	33196	33196	33196	29507	29507	36884
		FEED	1343	1343	1343	1023	1023	1023	682	682	1634	1343	1343	1023	2213	2213	2213	1793	1793	1793	1793	1416	1416	2213
		Ap	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.011	0.009	0.008	0.008	0.013	0.012	0.012	0.010	0.010	0.009	0.009	0.009	0.008	0.014
	39.3	Vc	56	56	56	49	49	49	37	37	72	65	65	58	82	82	82	74	74	74	74	66	66	93
		fz	0.020	0.020	0.020	0.018	0.018	0.018	0.015	0.015	0.022	0.020	0.020	0.018	0.029	0.029	0.029	0.026	0.026	0.026	0.026	0.023	0.023	0.029
		RPM	29507	29507	29507	26229	26229	26229	19672	19672	32786	29507	29507	26229	32786	32786	32786	29507	29507	29507	29507	26229	26229	32786
		FEED	1180	1180	1180	944	944	944	590	590	1443	1180	1180	944	1902	1902	1902	1534	1534	1534	1534	1207	1207	1902
		Ap	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.009	0.007	0.006	0.006	0.010	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.007	0.012
	40	Vc	88	88	88	78	78	78	59	59	114	103	103	91	129	129	129	116	116	116	116	103	103	145
		fz	0.023	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.025	0.023	0.023	0.020	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	46720	46720	46720	41529	41529	41529	31147	31147	51911	46720	46720	41529	51228	51228	51228	46105	46105	46105	46105	40982	40982	51228
		FEED	2149	2149	2149	1661	1661	1661	1121	1121	2596	2149	2149	1661	3381	3381	3381	2766	2766	2766	2766	2131	2131	3381
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015
	41	Vc	79	79	79	70	70	70	53	53	102	92	92	82	118	118	118	107	107	107	107	95	95	133
		fz	0.022	0.022	0.022	0.019	0.019	0.019	0.017	0.017	0.024	0.022	0.022	0.019	0.033	0.033	0.033	0.030	0.030	0.030	0.030	0.026	0.026	0.033
		RPM	41802	41802	41802	37158	37158	37158	27868	27868	46447	41802	41802	37158	47130	47130	47130	42417	42417	42417	42417	37704	37704	47130
		FEED	1839	1839	1839	1412	1412	1412	948	948	2229	1839	1839	1412	3111	3111	3111	2545	2545	2545	2545	1961	1961	3111
		Ap	0.007	0.007	0.007	0.007	0.007	0.007	0.005	0.005	0.012	0.010	0.008	0.008	0.014	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.015

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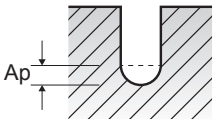

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
			LBS	30	2.4	4	6	8	10	12	14	16	8	12	16	3	3.8	4	6	8	10	12	14	15	16
P	5	Vc	48	196	196	196	176	176	176	157	157	197	197	175	242	242	242	242	218	218	218	218	218	194
		fz	0.029	0.051	0.051	0.051	0.046	0.046	0.046	0.041	0.041	0.048	0.048	0.042	0.054	0.054	0.054	0.054	0.049	0.049	0.049	0.049	0.049	0.043
		RPM	15245	51911	51911	51911	46720	46720	46720	41529	41529	44814	44814	39834	51365	51365	51365	51365	46229	46229	46229	46229	46229	41092
		FEED	884	5295	5295	5295	4298	4298	4298	3405	3405	4302	4302	3346	5547	5547	5547	5547	4530	4530	4530	4530	4530	3534
		Ap	0.005	0.024	0.022	0.022	0.019	0.017	0.017	0.017	0.016	0.022	0.020	0.020	0.030	0.030	0.030	0.027	0.024	0.024	0.024	0.021	0.021	0.021
	8-9	Vc	48	196	196	196	176	176	176	157	157	197	197	175	242	242	242	242	218	218	218	218	218	194
		fz	0.029	0.051	0.051	0.051	0.046	0.046	0.046	0.041	0.041	0.048	0.048	0.042	0.054	0.054	0.054	0.054	0.049	0.049	0.049	0.049	0.049	0.043
		RPM	15245	51911	51911	51911	46720	46720	46720	41529	41529	44814	44814	39834	51365	51365	51365	51365	46229	46229	46229	46229	46229	41092
		FEED	884	5295	5295	5295	4298	4298	4298	3405	3405	4302	4302	3346	5547	5547	5547	5547	4530	4530	4530	4530	4530	3534
		Ap	0.005	0.024	0.022	0.022	0.019	0.017	0.017	0.017	0.016	0.022	0.020	0.020	0.030	0.030	0.030	0.027	0.024	0.024	0.024	0.021	0.021	0.021
	11.1	Vc	48	196	196	196	176	176	176	157	157	197	197	175	242	242	242	242	218	218	218	218	218	194
		fz	0.029	0.051	0.051	0.051	0.046	0.046	0.046	0.041	0.041	0.048	0.048	0.042	0.054	0.054	0.054	0.054	0.049	0.049	0.049	0.049	0.049	0.043
		RPM	15245	51911	51911	51911	46720	46720	46720	41529	41529	44814	44814	39834	51365	51365	51365	51365	46229	46229	46229	46229	46229	41092
		FEED	884	5295	5295	5295	4298	4298	4298	3405	3405	4302	4302	3346	5547	5547	5547	5547	4530	4530	4530	4530	4530	3534
		Ap	0.005	0.024	0.022	0.022	0.019	0.017	0.017	0.017	0.016	0.022	0.020	0.020	0.030	0.030	0.030	0.027	0.024	0.024	0.024	0.021	0.021	0.021
	11.2	Vc	48	185	185	185	167	167	167	148	148	189	189	168	232	232	232	232	209	209	209	209	209	185
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	15245	49178	49178	49178	44260	44260	44260	39342	39342	42971	42971	38197	49178	49178	49178	49178	44260	44260	44260	44260	44260	39342
		FEED	762	4426	4426	4426	3585	3585	3585	2833	2833	3558	3558	2811	4623	4623	4623	4623	3718	3718	3718	3718	3718	2990
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018
H	38.1	Vc	48	185	185	185	167	167	167	148	148	189	189	168	232	232	232	232	209	209	209	209	209	185
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	15245	49178	49178	49178	44260	44260	44260	39342	39342	42971	42971	38197	49178	49178	49178	49178	44260	44260	44260	44260	44260	39342
		FEED	762	4426	4426	4426	3585	3585	3585	2833	2833	3558	3558	2811	4623	4623	4623	4623	3718	3718	3718	3718	3718	2990
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018
	38.2	Vc	43	165	165	165	148	148	148	132	132	172	172	153	211	211	211	211	190	190	190	190	190	169
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	13770	43714	43714	43714	39343	39343	39343	34971	34971	39084	39084	34742	44807	44807	44807	44807	40326	40326	40326	40326	40326	35846
		FEED	689	3934	3934	3934	3226	3226	3226	2518	2518	3205	3205	2571	4212	4212	4212	4212	3387	3387	3387	3387	3387	2724
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018
	39.1	Vc	39	149	149	149	134	134	134	119	119	147	147	130	180	180	180	180	162	162	162	162	162	144
		fz	0.023	0.039	0.039	0.039	0.035	0.035	0.035	0.031	0.031	0.037	0.037	0.033	0.042	0.042	0.042	0.042	0.038	0.038	0.038	0.038	0.038	0.034
		RPM	12295	39616	39616	39616	35654	35654	35654	31693	31693	33354	33354	29648	38250	38250	38250	38250	34425	34425	34425	34425	34425	30600
		FEED	566	3090	3090	3090	2496	2496	2496	1965	1965	2468	2468	1957	3213	3213	3213	3213	2616	2616	2616	2616	2616	2081
		Ap	0.004	0.019	0.017	0.017	0.015	0.013	0.013	0.013	0.012	0.018	0.016	0.016	0.024	0.024	0.024	0.022	0.019	0.019	0.019	0.017	0.017	0.017
	39.2	Vc	34	134	134	134	121	121	121	107	107	130	130	115	160	160	160	160	144	144	144	144	144	128
		fz	0.022	0.040	0.040	0.040	0.036	0.036	0.036	0.032	0.032	0.037	0.037	0.033	0.041	0.041	0.041	0.041	0.037	0.037	0.037	0.037	0.037	0.033
		RPM	10819	35519	35519	35519	31967	31967	31967	28415	28415	29466	29466	26192	33879	33879	33879	33879	30491	30491	30491	30491	30491	27103
		FEED	476	2842	2842	2842	2302	2302	2302	1819	1819	2180	2180	1729	2778	2778	2778	2778	2256	2256	2256	2256	2256	1789
		Ap	0.004	0.019	0.017	0.017	0.015	0.013	0.013	0.013	0.012	0.018	0.016	0.016	0.024	0.024	0.024	0.022	0.019	0.019	0.019	0.017	0.017	0.017
	39.3	Vc	34	118	118	118	107	107	107	95	95	117	117	104	144	144	144	144	130	130	130	130	130	115
		fz	0.020	0.038	0.038	0.038	0.034	0.034	0.034	0.030	0.030	0.035	0.035	0.031	0.039	0.039	0.039	0.039	0.035	0.035	0.035	0.035	0.035	0.031
		RPM	10819	31420	31420	31420	28278	28278	28278	25136	25136	26601	26601	23646	30600	30600	30600	30600	27540	27540	27540	27540	27540	24480
		FEED	433	2388	2388	2388	1923	1923	1923	1508	1508	1862	1862	1466	2387	2387	2387	2387	1928	1928	1928	1928	1928	1518
		Ap	0.003	0.016	0.014	0.014	0.012	0.011	0.011	0.011	0.010	0.015	0.013	0.013	0.020	0.020	0.020	0.018	0.016	0.016	0.016	0.014	0.014	0.014
	40	Vc	48	185	185	185	167	167	167	148	148	189	189	168	232	232	232	232	209	209	209	209	209	185
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	15245	49178	49178	49178	44260	44260	44260	39342	39342	42971	42971	38197	49178	49178	49178	49178	44260	44260	44260	44260	44260	39342
		FEED	762	4426	4426	4426	3585	3585	3585	2833	2833	3558	3558	2811	4623	4623	4623	4623	3718	3718	3718	3718	3718	2990
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018
	41	Vc	43	165	165	165	148	148	148	132	132	172	172	153	211	211	211	211	190	190	190	190	190	169
		fz	0.025	0.045	0.045	0.045	0.041	0.041	0.041	0.036	0.036	0.041	0.041	0.037	0.047	0.047	0.047	0.047	0.042	0.042	0.042	0.042	0.042	0.038
		RPM	13770	43714	43714	43714	39343	39343	39343	34971	34971	39084	39084	34742	44807	44807	44807	44807	40326	40326	40326	40326	40326	35846
		FEED	689	3934	3934	3934	3226	3226	3226	2518	2518	3205	3205	2571	4212	4212	4212	4212	3387	3387	3387	3387	3387	2724
		Ap	0.004	0.020	0.018	0.018	0.016	0.014	0.014	0.014	0.013	0.019	0.017	0.017	0.026	0.026	0.026	0.023	0.020	0.020	0.020	0.018	0.018	0.018

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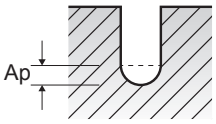

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			2	2	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3	3	3	3	3
			LBS	25	30	35	40	50	6	8	10	15	20	25	30	35	6	8	10	12	14	15	16	20	25
P	5	Vc	255	255	192	192	96	320	320	320	288	288	288	256	256	319	319	319	319	319	319	287	287	287
		fz	0.046	0.046	0.040	0.040	0.034	0.074	0.074	0.074	0.066	0.066	0.066	0.059	0.059	0.091	0.091	0.091	0.091	0.091	0.091	0.082	0.082	0.082
		RPM	40654	40654	30491	30491	15245	40685	40685	40685	36617	36617	36617	32548	32548	33879	33879	33879	33879	33879	33879	30491	30491	30491
		FEED	3740	3740	2439	2439	1037	6021	6021	6021	4833	4833	4833	3841	3841	6166	6166	6166	6166	6166	6166	5001	5001	5001
		Ap	0.028	0.026	0.020	0.020	0.010	0.050	0.045	0.045	0.040	0.040	0.035	0.035	0.033	0.060	0.060	0.054	0.054	0.054	0.054	0.048	0.048	0.042
	8-9	Vc	255	255	192	192	96	320	320	320	288	288	288	256	256	319	319	319	319	319	319	287	287	287
		fz	0.046	0.046	0.040	0.040	0.034	0.074	0.074	0.074	0.066	0.066	0.066	0.059	0.059	0.091	0.091	0.091	0.091	0.091	0.091	0.082	0.082	0.082
		RPM	40654	40654	30491	30491	15245	40685	40685	40685	36617	36617	36617	32548	32548	33879	33879	33879	33879	33879	33879	30491	30491	30491
		FEED	3740	3740	2439	2439	1037	6021	6021	6021	4833	4833	4833	3841	3841	6166	6166	6166	6166	6166	6166	5001	5001	5001
		Ap	0.028	0.026	0.020	0.020	0.010	0.050	0.045	0.045	0.040	0.040	0.035	0.035	0.033	0.060	0.060	0.054	0.054	0.054	0.054	0.048	0.048	0.042
	11.1	Vc	255	255	192	192	96	320	320	320	288	288	288	256	256	319	319	319	319	319	319	287	287	287
		fz	0.046	0.046	0.040	0.040	0.034	0.074	0.074	0.074	0.066	0.066	0.066	0.059	0.059	0.091	0.091	0.091	0.091	0.091	0.091	0.082	0.082	0.082
		RPM	40654	40654	30491	30491	15245	40685	40685	40685	36617	36617	36617	32548	32548	33879	33879	33879	33879	33879	33879	30491	30491	30491
		FEED	3740	3740	2439	2439	1037	6021	6021	6021	4833	4833	4833	3841	3841	6166	6166	6166	6166	6166	6166	5001	5001	5001
		Ap	0.028	0.026	0.020	0.020	0.010	0.050	0.045	0.045	0.040	0.040	0.035	0.035	0.033	0.060	0.060	0.054	0.054	0.054	0.054	0.048	0.048	0.042
	11.2	Vc	247	247	185	185	93	309	309	309	278	278	278	247	247	309	309	309	309	309	309	278	278	278
		fz	0.040	0.040	0.035	0.035	0.030	0.066	0.066	0.066	0.059	0.059	0.059	0.053	0.053	0.083	0.083	0.083	0.083	0.083	0.083	0.075	0.075	0.075
		RPM	39342	39342	29507	29507	14753	39295	39295	39295	35366	35366	35366	31436	31436	32786	32786	32786	32786	32786	32786	29507	29507	29507
		FEED	3147	3147	2065	2065	885	5187	5187	5187	4173	4173	4173	3332	3332	5442	5442	5442	5442	5442	5442	4426	4426	4426
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036
H	38.1	Vc	247	247	185	185	93	309	309	309	278	278	278	247	247	309	309	309	309	309	309	278	278	278
		fz	0.040	0.040	0.035	0.035	0.030	0.066	0.066	0.066	0.059	0.059	0.059	0.053	0.053	0.083	0.083	0.083	0.083	0.083	0.083	0.075	0.075	0.075
		RPM	39342	39342	29507	29507	14753	39295	39295	39295	35366	35366	35366	31436	31436	32786	32786	32786	32786	32786	32786	29507	29507	29507
		FEED	3147	3147	2065	2065	885	5187	5187	5187	4173	4173	4173	3332	3332	5442	5442	5442	5442	5442	5442	4426	4426	4426
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036
	38.2	Vc	206	206	155	155	77	257	257	257	232	232	232	206	206	258	258	258	258	258	258	232	232	232
		fz	0.040	0.040	0.035	0.035	0.030	0.063	0.063	0.063	0.056	0.056	0.056	0.050	0.050	0.075	0.075	0.075	0.075	0.075	0.075	0.068	0.068	0.068
		RPM	32786	32786	24590	24590	12295	32754	32754	32754	29479	29479	29479	26203	26203	27322	27322	27322	27322	27322	27322	24590	24590	24590
		FEED	2623	2623	1721	1721	738	4127	4127	4127	3302	3302	3302	2620	2620	4098	4098	4098	4098	4098	4098	3344	3344	3344
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036
	39.1	Vc	181	181	136	136	68	227	227	227	204	204	204	181	181	227	227	227	227	227	227	204	204	204
		fz	0.036	0.036	0.032	0.032	0.027	0.056	0.056	0.056	0.050	0.050	0.050	0.045	0.045	0.067	0.067	0.067	0.067	0.067	0.067	0.060	0.060	0.060
		RPM	28851	28851	21638	21638	10819	28840	28840	28840	25956	25956	25956	23072	23072	24043	24043	24043	24043	24043	24043	21639	21639	21639
		FEED	2077	2077	1385	1385	584	3230	3230	3230	2596	2596	2596	2076	2076	3222	3222	3222	3222	3222	3222	2597	2597	2597
		Ap	0.022	0.021	0.016	0.016	0.008	0.040	0.036	0.036	0.032	0.032	0.028	0.028	0.026	0.048	0.048	0.043	0.043	0.043	0.043	0.038	0.038	0.034
	39.2	Vc	165	165	124	124	62	206	206	206	186	186	186	165	165	206	206	206	206	206	206	185	185	185
		fz	0.035	0.035	0.031	0.031	0.026	0.055	0.055	0.055	0.050	0.050	0.050	0.044	0.044	0.067	0.067	0.067	0.067	0.067	0.067	0.060	0.060	0.060
		RPM	26229	26229	19672	19672	9836	26265	26265	26265	23639	23639	23639	21012	21012	21858	21858	21858	21858	21858	21858	19672	19672	19672
		FEED	1836	1836	1220	1220	511	2889	2889	2889	2364	2364	2364	1849	1849	2929	2929	2929	2929	2929	2929	2361	2361	2361
		Ap	0.022	0.021	0.016	0.016	0.008	0.040	0.036	0.036	0.032	0.032	0.028	0.028	0.026	0.048	0.048	0.043	0.043	0.043	0.043	0.038	0.038	0.034
	39.3	Vc	148	148	111	111	56	185	185	185	167	167	167	148	148	185	185	185	185	185	185	167	167	167
		fz	0.032	0.032	0.028	0.028	0.024	0.051	0.051	0.051	0.045	0.045	0.045	0.040	0.040	0.061	0.061	0.061	0.061	0.061	0.061	0.055	0.055	0.055
		RPM	23606	23606	17704	17704	8852	23587	23587	23587	21228	21228	21228	18870	18870	19672	19672	19672	19672	19672	19672	17705	17705	17705
		FEED	1511	1511	991	991	425	2406	2406	2406	1911	1911	1911	1510	1510	2400	2400	2400	2400	2400	2400	1948	1948	1948
		Ap	0.018	0.017	0.013	0.013	0.007	0.033	0.029	0.029	0.026	0.026	0.023	0.023	0.021	0.039	0.039	0.035	0.035	0.035	0.035	0.031	0.031	0.027
	40	Vc	247	247	185	185	93	309	309	309	278	278	278	247	247	309	309	309	309	309	309	278	278	278
		fz	0.040	0.040	0.035	0.035	0.030	0.066	0.066	0.066	0.059	0.059	0.059	0.053	0.053	0.083	0.083	0.083	0.083	0.083	0.083	0.075	0.075	0.075
		RPM	39342	39342	29507	29507	14753	39295	39295	39295	35366	35366	35366	31436	31436	32786	32786	32786	32786	32786	32786	29507	29507	29507
		FEED	3147	3147	2065	2065	885	5187	5187	5187	4173	4173	4173	3332	3332	5442	5442	5442	5442	5442	5442	4426	4426	4426
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036
	41	Vc	206	206	155	155	77	257	257	257	232	232	232	206	206	258	258	258	258	258	258	232	232	232
		fz	0.040	0.040	0.035	0.035	0.030	0.063	0.063	0.063	0.056	0.056	0.056	0.050	0.050	0.075	0.075	0.075	0.075	0.075	0.075	0.068	0.068	0.068
		RPM	32786	32786	24590	24590	12295	32754	32754	32754	29479	29479	29479	26203	26203	27322	27322	27322	27322	27322	27322	24590	24590	24590
		FEED	2623	2623	1721	1721	738	4127	4127	4127	3302	3302	3302	2620	2620	4098	4098	4098	4098	4098	4098	3344	3344	3344
		Ap	0.024	0.022	0.017	0.017	0.009	0.043	0.038	0.038	0.034	0.034	0.030	0.030	0.028	0.051	0.051	0.046	0.046	0.046	0.046	0.041	0.041	0.036

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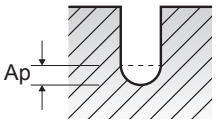

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7	7
			LBS	45	50	61.1	10	12	15	20	25	30	40	10	15	20	25	30	35	40	50	60	40	45	60
P	5	Vc	260	260	195	299	299	299	299	299	269	269	268	268	268	268	268	241	241	241	241	255	255	255
		fz	0.096	0.096	0.084	0.156	0.156	0.156	0.156	0.156	0.140	0.140	0.174	0.174	0.174	0.174	0.174	0.157	0.157	0.157	0.157	0.162	0.162	0.162
		RPM	20655	20655	15491	19016	19016	19016	19016	19016	17114	17114	14207	14207	14207	14207	14207	12786	12786	12786	12786	11588	11588	11588
		FEED	3966	3966	2602	5933	5933	5933	5933	5933	4792	4792	4944	4944	4944	4944	4944	4015	4015	4015	4015	3755	3755	3755
		Ap	0.056	0.056	0.052	0.100	0.100	0.100	0.090	0.090	0.080	0.080	0.120	0.120	0.108	0.108	0.108	0.096	0.096	0.084	0.084	0.112	0.112	0.098
	8-9	Vc	260	260	195	299	299	299	299	299	269	269	268	268	268	268	268	241	241	241	241	255	255	255
		fz	0.096	0.096	0.084	0.156	0.156	0.156	0.156	0.156	0.140	0.140	0.174	0.174	0.174	0.174	0.174	0.157	0.157	0.157	0.157	0.162	0.162	0.162
		RPM	20655	20655	15491	19016	19016	19016	19016	19016	17114	17114	14207	14207	14207	14207	14207	12786	12786	12786	12786	11588	11588	11588
		FEED	3966	3966	2602	5933	5933	5933	5933	5933	4792	4792	4944	4944	4944	4944	4944	4015	4015	4015	4015	3755	3755	3755
		Ap	0.056	0.056	0.052	0.100	0.100	0.100	0.090	0.090	0.080	0.080	0.120	0.120	0.108	0.108	0.108	0.096	0.096	0.084	0.084	0.112	0.112	0.098
	11.1	Vc	260	260	195	299	299	299	299	299	269	269	268	268	268	268	268	241	241	241	241	255	255	255
		fz	0.096	0.096	0.084	0.156	0.156	0.156	0.156	0.156	0.140	0.140	0.174	0.174	0.174	0.174	0.174	0.157	0.157	0.157	0.157	0.162	0.162	0.162
		RPM	20655	20655	15491	19016	19016	19016	19016	19016	17114	17114	14207	14207	14207	14207	14207	12786	12786	12786	12786	11588	11588	11588
		FEED	3966	3966	2602	5933	5933	5933	5933	5933	4792	4792	4944	4944	4944	4944	4944	4015	4015	4015	4015	3755	3755	3755
		Ap	0.056	0.056	0.052	0.100	0.100	0.100	0.090	0.090	0.080	0.080	0.120	0.120	0.108	0.108	0.108	0.096	0.096	0.084	0.084	0.112	0.112	0.098
	11.2	Vc	247	247	185	288	288	288	288	288	260	260	263	263	263	263	263	236	236	236	236	246	246	246
		fz	0.089	0.089	0.078	0.138	0.138	0.138	0.138	0.138	0.124	0.124	0.153	0.153	0.153	0.153	0.153	0.138	0.138	0.138	0.138	0.143	0.143	0.143
		RPM	19671	19671	14753	18360	18360	18360	18360	18360	16524	16524	13934	13934	13934	13934	13934	12541	12541	12541	12541	11171	11171	11171
		FEED	3501	3501	2301	5067	5067	5067	5067	5067	4098	4098	4264	4264	4264	4264	4264	3461	3461	3461	3461	3195	3195	3195
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083
H	38.1	Vc	247	247	185	288	288	288	288	288	260	260	263	263	263	263	263	236	236	236	236	246	246	246
		fz	0.089	0.089	0.078	0.138	0.138	0.138	0.138	0.138	0.124	0.124	0.153	0.153	0.153	0.153	0.153	0.138	0.138	0.138	0.138	0.143	0.143	0.143
		RPM	19671	19671	14753	18360	18360	18360	18360	18360	16524	16524	13934	13934	13934	13934	13934	12541	12541	12541	12541	11171	11171	11171
		FEED	3501	3501	2301	5067	5067	5067	5067	5067	4098	4098	4264	4264	4264	4264	4264	3461	3461	3461	3461	3195	3195	3195
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083
	38.2	Vc	206	206	155	242	242	242	242	242	218	218	211	211	211	211	211	190	190	190	190	199	199	199
		fz	0.080	0.080	0.070	0.125	0.125	0.125	0.125	0.125	0.113	0.113	0.141	0.141	0.141	0.141	0.141	0.127	0.127	0.127	0.127	0.133	0.133	0.133
		RPM	16393	16393	12295	15410	15410	15410	15410	15410	13869	13869	11202	11202	11202	11202	11202	10082	10082	10082	10082	9048	9048	9048
		FEED	2623	2623	1721	3853	3853	3853	3853	3853	3134	3134	3159	3159	3159	3159	3159	2561	2561	2561	2561	2407	2407	2407
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083
	39.1	Vc	181	181	136	216	216	216	216	216	195	195	196	196	196	196	196	176	176	176	176	180	180	180
		fz	0.072	0.072	0.063	0.113	0.113	0.113	0.113	0.113	0.102	0.102	0.125	0.125	0.125	0.125	0.125	0.113	0.113	0.113	0.113	0.118	0.118	0.118
		RPM	14426	14426	10819	13770	13770	13770	13770	13770	12393	12393	10382	10382	10382	10382	10382	9344	9344	9344	9344	8204	8204	8204
		FEED	2077	2077	1363	3112	3112	3112	3112	3112	2528	2528	2596	2596	2596	2596	2596	2112	2112	2112	2112	1936	1936	1936
		Ap	0.045	0.045	0.042	0.080	0.080	0.080	0.072	0.072	0.064	0.064	0.096	0.096	0.086	0.086	0.086	0.077	0.077	0.067	0.067	0.090	0.090	0.078
	39.2	Vc	165	165	124	185	185	185	185	185	167	167	170	170	170	170	170	153	153	153	153	158	158	158
		fz	0.070	0.070	0.062	0.111	0.111	0.111	0.111	0.111	0.100	0.100	0.122	0.122	0.122	0.122	0.122	0.110	0.110	0.110	0.110	0.115	0.115	0.115
		RPM	13114	13114	9835	11803	11803	11803	11803	11803	10623	10623	9017	9017	9017	9017	9017	8115	8115	8115	8115	7185	7185	7185
		FEED	1836	1836	1220	2620	2620	2620	2620	2620	2125	2125	2200	2200	2200	2200	2200	1785	1785	1785	1785	1653	1653	1653
		Ap	0.045	0.045	0.042	0.080	0.080	0.080	0.072	0.072	0.064	0.064	0.096	0.096	0.086	0.086	0.086	0.077	0.077	0.067	0.067	0.090	0.090	0.078
	39.3	Vc	148	148	111	170	170	170	170	170	153	153	155	155	155	155	155	139	139	139	139	148	148	148
		fz	0.063	0.063	0.055	0.100	0.100	0.100	0.100	0.100	0.090	0.090	0.109	0.109	0.109	0.109	0.109	0.098	0.098	0.098	0.098	0.102	0.102	0.102
		RPM	11803	11803	8852	10819	10819	10819	10819	10819	9737	9737	8197	8197	8197	8197	8197	7377	7377	7377	7377	6731	6731	6731
		FEED	1487	1487	974	2164	2164	2164	2164	2164	1753	1753	1787	1787	1787	1787	1787	1446	1446	1446	1446	1373	1373	1373
		Ap	0.036	0.036	0.034	0.065	0.065	0.065	0.059	0.059	0.052	0.052	0.078	0.078	0.070	0.070	0.070	0.062	0.062	0.055	0.055	0.073	0.073	0.064
	40	Vc	247	247	185	288	288	288	288	288	260	260	263	263	263	263	263	236	236	236	236	246	246	246
		fz	0.089	0.089	0.078	0.138	0.138	0.138	0.138	0.138	0.124	0.124	0.153	0.153	0.153	0.153	0.153	0.138	0.138	0.138	0.138	0.143	0.143	0.143
		RPM	19671	19671	14753	18360	18360	18360	18360	18360	16524	16524	13934	13934	13934	13934	13934	12541	12541	12541	12541	11171	11171	11171
		FEED	3501	3501	2301	5067	5067	5067	5067	5067	4098	4098	4264	4264	4264	4264	4264	3461	3461	3461	3461	3195	3195	3195
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083
	41	Vc	206	206	155	242	242	242	242	242	218	218	211	211	211	211	211	190	190	190	190	199	199	199
		fz	0.080	0.080	0.070	0.125	0.125	0.125	0.125	0.125	0.113	0.113	0.141	0.141	0.141	0.141	0.141	0.127	0.127	0.127	0.127	0.133	0.133	0.133
		RPM	16393	16393	12295	15410	15410	15410	15410	15410	13869	13869	11202	11202	11202	11202	11202	10082	10082	10082	10082	9048	9048	9048
		FEED	2623	2623	1721	3853	3853	3853	3853	3853	3134	3134	3159	3159	3159	3159	3159	2561	2561	2561	2561	2407	2407	2407
		Ap	0.048	0.048	0.044	0.085	0.085	0.085	0.077	0.077	0.068	0.068	0.102	0.102	0.092	0.092	0.092	0.082	0.082	0.071	0.071	0.095	0.095	0.083

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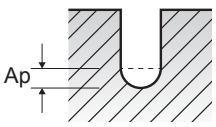

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI89 SERIES — **2 FLUTE CORNER RADIUS for RIB PROCESSING**

ISO	VDI 3323	Material Description	Slotting	Para-meter	Diameter (Ø)																	
					0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
			Ae	LBS	0.5	1	1.5	2	1	1.5	2	2.5	3	1	1.5	2	2.5	3	4	1	2	3
P	5	Non-alloy steel	1.0D	Vc	31	31	28	28	46	46	42	42	42	67	67	67	60	60	60	82	82	74
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004
				RPM	49178	49178	44260	44260	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949	52458	52458	47212
				FEED	98	98	89	89	197	197	177	177	177	213	213	213	192	192	192	420	420	378
				Ap	0.010	0.009	0.008	0.007	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014	0.025	0.023	0.020
	8~9	Low alloy steel	1.0D	Vc	31	31	28	28	46	46	42	42	42	67	67	67	60	60	60	82	82	74
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004
				RPM	49178	49178	44260	44260	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949	52458	52458	47212
				FEED	98	98	89	89	197	197	177	177	177	213	213	213	192	192	192	420	420	378
				Ap	0.010	0.009	0.008	0.007	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014	0.025	0.023	0.020
	11.1	High alloyed steel, and tool steel	1.0D	Vc	31	31	28	28	46	46	42	42	42	67	67	67	60	60	60	82	82	74
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004
				RPM	49178	49178	44260	44260	49178	49178	44260	44260	44260	53277	53277	53277	47949	47949	47949	52458	52458	47212
				FEED	98	98	89	89	197	197	177	177	177	213	213	213	192	192	192	420	420	378
				Ap	0.010	0.009	0.008	0.007	0.014	0.014	0.012	0.011	0.011	0.020	0.018	0.018	0.016	0.016	0.014	0.025	0.023	0.020
	11.2		1.0D	Vc	31	31	28	28	41	41	37	37	37	57	57	57	51	51	51	72	72	65
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	49178	49178	44260	44260	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573	45900	45900	41310
				FEED	98	98	89	89	175	175	157	157	157	180	180	180	162	162	162	275	275	248
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017
H	38.1	Hardened steel	1.0D	Vc	31	31	28	28	41	41	37	37	37	57	57	57	51	51	51	72	72	65
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	49178	49178	44260	44260	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573	45900	45900	41310
				FEED	98	98	89	89	175	175	157	157	157	180	180	180	162	162	162	275	275	248
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017
	38.2		1.0D	Vc	26	26	23	23	41	41	37	37	37	52	52	52	46	46	46	67	67	60
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	40983	40983	36885	36885	43714	43714	39343	39343	39343	40983	40983	40983	36885	36885	36885	42621	42621	38359
				FEED	82	82	74	74	87	87	79	79	79	164	164	164	148	148	148	256	256	230
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017
	39.1		1.0D	Vc	21	21	19	19	31	31	28	28	28	41	41	41	37	37	37	52	52	46
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002
				RPM	32786	32786	29507	29507	32786	32786	29507	29507	29507	32786	32786	32786	29507	29507	29507	32786	32786	29507
				FEED	66	66	59	59	66	66	59	59	59	66	66	66	59	59	59	131	131	118
				Ap	0.008	0.007	0.006	0.006	0.011	0.011	0.010	0.008	0.008	0.016	0.014	0.014	0.013	0.013	0.011	0.020	0.018	0.016
	39.2		1.0D	Vc	21	21	19	19	26	26	23	23	23	31	31	31	28	28	28	41	41	37
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002
				RPM	32786	32786	29507	29507	27322	27322	24590	24590	24590	24589	24589	24589	22130	22130	22130	26229	26229	23606
				FEED	66	66	59	59	55	55	49	49	49	49	49	49	44	44	44	105	105	94
				Ap	0.008	0.007	0.006	0.006	0.011	0.011	0.010	0.008	0.008	0.016	0.014	0.014	0.013	0.013	0.011	0.020	0.018	0.016
	39.3		1.0D	Vc	21	21	19	19	21	21	19	19	19	26	26	26	23	23	23	31	31	28
				fz	0.009	0.009	0.008	0.008	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001
				RPM	32786	32786	29507	29507	21858	21858	19672	19672	19672	20491	20491	20491	18442	18442	18442	19672	19672	17705
				FEED	590	590	472	472	44	44	39	39	39	41	41	41	37	37	37	79	79	35
				Ap	0.007	0.006	0.005	0.005	0.009	0.009	0.008	0.007	0.007	0.013	0.012	0.012	0.010	0.010	0.009	0.016	0.015	0.013
	40	Chilled Cast Iron	1.0D	Vc	31	31	28	28	41	41	37	37	37	57	57	57	51	51	51	72	72	65
				fz	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	49178	49178	44260	44260	43714	43714	39343	39343	39343	45081	45081	45081	40573	40573	40573	45900	45900	41310
				FEED	98	98	89	89	175	175	157	157	157	180	180	180	162	162	162	275	275	248
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017
	41	Hardened Cast Iron	1.0D	Vc	26	26	23	23	41	41	37	37	37	52	52	52	46	46	46	67	67	60
				fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
				RPM	40983	40983	36885	36885	43714	43714	39343	39343	39343	40983	40983	40983	36885	36885	36885	42621	42621	38359
				FEED	82	82	74	74	87	87	79	79	79	164	164	164	148	148	148	256	256	230
				Ap	0.009	0.008	0.007	0.006	0.011	0.011	0.010	0.009	0.009	0.017	0.015	0.015	0.014	0.014	0.012	0.021	0.019	0.017

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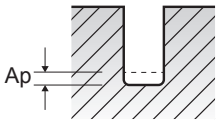


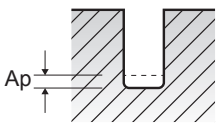
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI89 SERIES — 2 FLUTE CORNER RADIUS for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																					
			1	1	1	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2	2	3	3	3	3	3	3
			LBS	12	16	20	4	8	12	15	20	6	8	12	16	20	25	30	8	12	16	20	30	35
P	5	Vc	124	93	93	196	176	176	176	157	216	216	195	195	195	173	173	211	211	190	190	190	169	
		fz	0.008	0.007	0.007	0.011	0.010	0.010	0.010	0.009	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.019	0.019	0.017	0.017	0.017	0.015	
		RPM	39342	29507	29507	41581	37423	37423	37423	33265	34426	34426	30983	30983	30983	27541	27541	22404	22404	20164	20164	20164	17923	
		FEED	629	413	413	915	748	748	748	599	895	895	744	744	744	551	551	851	851	686	686	686	538	
		Ap	0.035	0.030	0.025	0.075	0.060	0.060	0.053	0.045	0.100	0.090	0.080	0.080	0.070	0.070	0.060	0.150	0.135	0.120	0.120	0.105	0.105	
	8~9	Vc	124	93	93	196	176	176	176	157	216	216	195	195	195	173	173	211	211	190	190	190	169	
		fz	0.008	0.007	0.007	0.011	0.010	0.010	0.010	0.009	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.019	0.019	0.017	0.017	0.017	0.015	
		RPM	39342	29507	29507	41581	37423	37423	37423	33265	34426	34426	30983	30983	30983	27541	27541	22404	22404	20164	20164	20164	17923	
		FEED	629	413	413	915	748	748	748	599	895	895	744	744	744	551	551	851	851	686	686	686	538	
		Ap	0.035	0.030	0.025	0.075	0.060	0.060	0.053	0.045	0.100	0.090	0.080	0.080	0.070	0.070	0.060	0.150	0.135	0.120	0.120	0.105	0.105	
	11.1	Vc	124	93	93	196	176	176	176	157	216	216	195	195	195	173	173	211	211	190	190	190	169	
		fz	0.008	0.007	0.007	0.011	0.010	0.010	0.010	0.009	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.019	0.019	0.017	0.017	0.017	0.015	
		RPM	39342	29507	29507	41581	37423	37423	37423	33265	34426	34426	30983	30983	30983	27541	27541	22404	22404	20164	20164	20164	17923	
		FEED	629	413	413	915	748	748	748	599	895	895	744	744	744	551	551	851	851	686	686	686	538	
		Ap	0.035	0.030	0.025	0.075	0.060	0.060	0.053	0.045	0.100	0.090	0.080	0.080	0.070	0.070	0.060	0.150	0.135	0.120	0.120	0.105	0.105	
	11.2	Vc	99	74	74	154	139	139	139	123	170	170	153	153	153	136	136	170	170	153	153	153	136	
		fz	0.006	0.006	0.006	0.010	0.009	0.009	0.009	0.008	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.020	0.020	0.018	0.018	0.018	0.016	
		RPM	31474	23606	23606	32754	29479	29479	29479	26203	27049	27049	24344	24344	24344	21639	21639	18032	18032	16229	16229	16229	14426	
		FEED	378	283	283	655	531	531	531	419	703	703	584	584	584	433	433	721	721	584	584	584	462	
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089	
H	38.1	Vc	99	74	74	154	139	139	139	123	170	170	153	153	153	136	136	170	170	153	153	153	136	
		fz	0.006	0.006	0.006	0.010	0.009	0.009	0.009	0.008	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.020	0.020	0.018	0.018	0.018	0.016	
		RPM	31474	23606	23606	32754	29479	29479	29479	26203	27049	27049	24344	24344	24344	21639	21639	18032	18032	16229	16229	16229	14426	
		FEED	378	283	283	655	531	531	531	419	703	703	584	584	584	433	433	721	721	584	584	584	462	
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089	
	38.2	Vc	66	49	49	103	93	93	93	83	113	113	102	102	102	91	91	113	113	102	102	102	91	
		fz	0.006	0.005	0.005	0.009	0.008	0.008	0.008	0.007	0.012	0.012	0.011	0.011	0.011	0.010	0.010	0.018	0.018	0.016	0.016	0.016	0.014	
		RPM	20983	15737	15737	21939	19745	19745	19745	17551	18032	18032	16229	16229	16229	14426	14426	12021	12021	10819	10819	10819	9617	
		FEED	252	157	157	395	316	316	316	246	433	433	357	357	357	289	289	433	433	346	346	346	269	
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089	
	39.1	Vc	54	40	40	83	74	74	74	66	93	93	83	83	83	74	74	93	93	83	83	83	74	
		fz	0.004	0.004	0.004	0.007	0.006	0.006	0.006	0.005	0.009	0.009	0.008	0.008	0.008	0.007	0.007	0.014	0.014	0.013	0.013	0.013	0.011	
		RPM	17049	12787	12787	17510	15759	15759	15759	14008	14754	14754	13279	13279	13279	11803	11803	9835	9835	8852	8852	8852	7868	
		FEED	136	102	102	245	189	189	189	140	266	266	212	212	212	165	165	275	275	230	230	230	173	
		Ap	0.028	0.024	0.020	0.060	0.048	0.048	0.042	0.036	0.080	0.072	0.064	0.064	0.056	0.056	0.048	0.120	0.108	0.096	0.096	0.084	0.084	
	39.2	Vc	41	31	31	62	56	56	56	50	72	72	65	65	65	58	58	72	72	65	65	65	58	
		fz	0.003	0.003	0.003	0.006	0.005	0.005	0.005	0.004	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.011	0.011	0.010	0.010	0.010	0.009	
		RPM	13114	9835	9835	13184	11866	11866	11866	10547	11475	11475	10328	10328	10328	9180	9180	7650	7650	6885	6885	6885	6120	
		FEED	79	59	59	158	119	119	119	84	161	161	124	124	124	110	110	168	168	138	138	138	110	
		Ap	0.028	0.024	0.020	0.060	0.048	0.048	0.042	0.036	0.080	0.072	0.064	0.064	0.056	0.056	0.048	0.120	0.108	0.096	0.096	0.084	0.084	
	39.3	Vc	33	25	25	52	47	47	47	42	62	62	56	56	56	49	49	62	62	56	56	56	49	
		fz	0.003	0.002	0.002	0.005	0.004	0.004	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.009	0.009	0.008	0.008	0.008	0.007	
		RPM	10491	7868	7868	11021	9919	9919	9919	8817	9835	9835	8852	8852	8852	7868	7868	6557	6557	5901	5901	5901	5246	
		FEED	63	31	31	110	79	79	79	71	118	118	89	89	89	79	79	118	118	94	94	94	73	
		Ap	0.023	0.020	0.016	0.049	0.039	0.039	0.034	0.029	0.065	0.059	0.052	0.052	0.046	0.046	0.039	0.098	0.088	0.078	0.078	0.068	0.068	
	40	Vc	99	74	74	154	139	139	139	123	170	170	153	153	153	136	136	170	170	153	153	153	136	
		fz	0.006	0.006	0.006	0.010	0.009	0.009	0.009	0.008	0.013	0.013	0.012	0.012	0.012	0.010	0.010	0.020	0.020	0.018	0.018	0.018	0.016	
		RPM	31474	23606	23606	32754	29479	29479	29479	26203	27049	27049	24344	24344	24344	21639	21639	18032	18032	16229	16229	16229	14426	
		FEED	378	283	283	655	531	531	531	419	703	703	584	584	584	433	433	721	721	584	584	584	462	
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089	
	41	Vc	66	49	49	103	93	93	93	83	113	113	102	102	102	91	91	113	113	102	102	102	91	
		fz	0.006	0.005	0.005	0.009	0.008	0.008	0.008	0.007	0.012	0.012	0.011	0.011	0.011	0.010	0.010	0.018	0.018	0.016	0.016	0.016	0.014	
		RPM	20983	15737	15737	21939	19745	19745	19745	17551	18032	18032	16229	16229	16229	14426	14426	12021	12021	10819	10819	10819	9617	
		FEED	252	157	157	395	316	316	316	246	433	433	357	357	357	289	289	433	433	346	346	346	269	
		Ap	0.030	0.026	0.021	0.064	0.051	0.051	0.045	0.038	0.085	0.077	0.068	0.068	0.060	0.060	0.051	0.128	0.115	0.102	0.102	0.089	0.089	



X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
			LBS	4	5	6	8	10	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	1.5	2
P	5	Vc	60	54	54	40	20	82	82	82	82	74	74	74	74	74	66	66	49	49	49	98	98
		fz	0.002	0.002	0.002	0.001	0.001	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005
		RPM	47949	42622	42622	31966	15983	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	31475	51911	51911
		FEED	192	170	170	64	32	420	420	420	420	378	378	378	378	378	252	252	189	189	189	519	519
		Ap	0.014	0.014	0.012	0.010	0.008	0.025	0.025	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.018	0.015	0.015	0.013	0.013	0.030	0.027
	8~9	Vc	60	54	54	40	20	82	82	82	82	74	74	74	74	74	66	66	49	49	49	98	98
		fz	0.002	0.002	0.002	0.001	0.001	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005
		RPM	47949	42622	42622	31966	15983	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	31475	51911	51911
		FEED	192	170	170	64	32	420	420	420	420	378	378	378	378	378	252	252	189	189	189	519	519
		Ap	0.014	0.014	0.012	0.010	0.008	0.025	0.025	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.018	0.015	0.015	0.013	0.013	0.030	0.027
	11.1	Vc	60	54	54	40	20	82	82	82	82	74	74	74	74	74	66	66	49	49	49	98	98
		fz	0.002	0.002	0.002	0.001	0.001	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005
		RPM	47949	42622	42622	31966	15983	52458	52458	52458	52458	47212	47212	47212	47212	47212	41966	41966	31475	31475	31475	51911	51911
		FEED	192	170	170	64	32	420	420	420	420	378	378	378	378	378	252	252	189	189	189	519	519
		Ap	0.014	0.014	0.012	0.010	0.008	0.025	0.025	0.023	0.023	0.020	0.020	0.020	0.018	0.018	0.018	0.015	0.015	0.013	0.013	0.030	0.027
	11.2	Vc	51	45	45	34	17	72	72	72	72	65	65	65	65	65	58	58	43	43	43	88	88
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	40573	36065	36065	27049	13524	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46447	46447
		FEED	162	144	144	54	27	275	275	275	275	248	248	248	248	248	147	147	110	110	110	372	372
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023
H	38.1	Vc	51	45	45	34	17	72	72	72	72	65	65	65	65	65	58	58	43	43	43	88	88
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	40573	36065	36065	27049	13524	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46447	46447
		FEED	162	144	144	54	27	275	275	275	275	248	248	248	248	248	147	147	110	110	110	372	372
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023
	38.2	Vc	46	41	41	31	15	67	67	67	67	60	60	60	60	60	54	54	40	40	40	77	77
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	36885	32786	32786	24590	12295	42621	42621	42621	42621	38359	38359	38359	38359	38359	34097	34097	25573	25573	25573	40983	40983
		FEED	148	131	131	49	25	256	256	256	256	230	230	230	230	230	136	136	102	102	102	328	328
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023
	39.1	Vc	37	33	33	25	12	52	52	52	52	46	46	46	46	46	41	41	31	31	31	57	57
		fz	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.003	0.003
		RPM	29507	26229	26229	19672	9836	32786	32786	32786	32786	29507	29507	29507	29507	29507	26229	26229	19672	19672	19672	30053	30053
		FEED	59	52	52	39	20	131	131	131	131	118	118	118	118	118	105	105	39	39	39	180	180
		Ap	0.011	0.011	0.010	0.008	0.006	0.020	0.020	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.014	0.012	0.012	0.010	0.010	0.024	0.022
	39.2	Vc	28	25	25	19	9	41	41	41	41	37	37	37	37	37	33	33	25	25	25	46	46
		fz	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.002
		RPM	22130	19671	19671	14753	7377	26229	26229	26229	26229	23606	23606	23606	23606	23606	20983	20983	15737	15737	15737	24589	24589
		FEED	44	39	39	30	15	105	105	105	105	94	94	94	94	94	42	42	31	31	31	98	98
		Ap	0.011	0.011	0.010	0.008	0.006	0.020	0.020	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.014	0.012	0.012	0.010	0.010	0.024	0.022
	39.3	Vc	23	21	21	15	8	31	31	31	31	28	28	28	28	28	25	25	19	19	19	41	41
		fz	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002
		RPM	18442	16393	16393	12295	6147	19672	19672	19672	19672	17705	17705	17705	17705	17705	15738	15738	11803	11803	11803	21858	21858
		FEED	37	33	33	25	12	79	79	79	79	35	35	35	35	35	31	31	24	24	24	87	87
		Ap	0.009	0.009	0.008	0.007	0.005	0.016	0.016	0.015	0.015	0.013	0.013	0.013	0.011	0.011	0.011	0.010	0.010	0.008	0.008	0.020	0.018
	40	Vc	51	45	45	34	17	72	72	72	72	65	65	65	65	65	58	58	43	43	43	88	88
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	40573	36065	36065	27049	13524	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46447	46447
		FEED	162	144	144	54	27	275	275	275	275	248	248	248	248	248	147	147	110	110	110	372	372
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023
	41	Vc	46	41	41	31	15	67	67	67	67	60	60	60	60	60	54	54	40	40	40	77	77
		fz	0.002	0.002	0.002	0.001	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004
		RPM	36885	32786	32786	24590	12295	42621	42621	42621	42621	38359	38359	38359	38359	38359	34097	34097	25573	25573	25573	40983	40983
		FEED	148	131	131	49	25	256	256	256	256	230	230	230	230	230	136	136	102	102	102	328	328
		Ap	0.012	0.012	0.010	0.009	0.007	0.021	0.021	0.019	0.019	0.017	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.011	0.011	0.026	0.023

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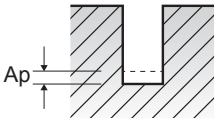

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			1	1	1	1	1	1	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.5	1.5	1.5
			LBS	6	7	8	9	10	12	14	16	18	20	22	6	8	10	12	16	6	12	4	6	8
P	5	Vc	139	139	139	139	139	124	124	93	93	93	46	170	153	153	153	136	185	167	196	196	176
		fz	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.011	0.009	0.009	0.009	0.008	0.011	0.010	0.011	0.011	0.010
		RPM	44260	44260	44260	44260	44260	39342	39342	29507	29507	29507	14753	45081	40573	40573	40573	36065	42154	37939	41581	41581	37423
		FEED	797	797	797	797	797	629	629	413	413	413	177	992	730	730	730	577	927	759	915	915	748
		Ap	0.040	0.040	0.040	0.035	0.035	0.035	0.030	0.030	0.025	0.025	0.020	0.054	0.048	0.042	0.042	0.036	0.063	0.049	0.075	0.068	0.060
	8~9	Vc	139	139	139	139	139	124	124	93	93	93	46	170	153	153	153	136	185	167	196	196	176
		fz	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.011	0.009	0.009	0.009	0.008	0.011	0.010	0.011	0.011	0.010
		RPM	44260	44260	44260	44260	44260	39342	39342	29507	29507	29507	14753	45081	40573	40573	40573	36065	42154	37939	41581	41581	37423
		FEED	797	797	797	797	797	629	629	413	413	413	177	992	730	730	730	577	927	759	915	915	748
		Ap	0.040	0.040	0.040	0.035	0.035	0.035	0.030	0.030	0.025	0.025	0.020	0.054	0.048	0.042	0.042	0.036	0.063	0.049	0.075	0.068	0.060
	11.1	Vc	139	139	139	139	139	124	124	93	93	93	46	170	153	153	153	136	185	167	196	196	176
		fz	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.007	0.007	0.007	0.006	0.011	0.009	0.009	0.009	0.008	0.011	0.010	0.011	0.011	0.010
		RPM	44260	44260	44260	44260	44260	39342	39342	29507	29507	29507	14753	45081	40573	40573	40573	36065	42154	37939	41581	41581	37423
		FEED	797	797	797	797	797	629	629	413	413	413	177	992	730	730	730	577	927	759	915	915	748
		Ap	0.040	0.040	0.040	0.035	0.035	0.035	0.030	0.030	0.025	0.025	0.020	0.054	0.048	0.042	0.042	0.036	0.063	0.049	0.075	0.068	0.060
	11.2	Vc	111	111	111	111	111	99	99	74	74	74	37	139	125	125	125	111	144	130	154	154	139
		fz	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.005	0.009	0.008	0.008	0.008	0.007	0.010	0.009	0.010	0.010	0.009
		RPM	35409	35409	35409	35409	35409	31474	31474	23606	23606	23606	11803	36884	33196	33196	33196	29507	32786	29507	32754	32754	29479
		FEED	496	496	496	496	496	378	378	283	283	283	118	664	538	538	538	425	662	536	655	655	531
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051
H	38.1	Vc	111	111	111	111	111	99	99	74	74	74	37	139	125	125	125	111	144	130	154	154	139
		fz	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.005	0.009	0.008	0.008	0.008	0.007	0.010	0.009	0.010	0.010	0.009
		RPM	35409	35409	35409	35409	35409	31474	31474	23606	23606	23606	11803	36884	33196	33196	33196	29507	32786	29507	32754	32754	29479
		FEED	496	496	496	496	496	378	378	283	283	283	118	664	538	538	538	425	662	536	655	655	531
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051
	38.2	Vc	74	74	74	74	74	66	66	49	49	49	25	93	83	83	83	74	98	88	103	103	93
		fz	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.004	0.008	0.007	0.007	0.007	0.006	0.009	0.008	0.009	0.009	0.008
		RPM	23606	23606	23606	23606	23606	20983	20983	15737	15737	15737	7869	24589	22130	22130	22130	19671	22248	20023	21939	21939	19745
		FEED	283	283	283	283	283	252	252	157	157	157	63	393	310	310	310	236	400	320	395	395	316
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051
	39.1	Vc	60	60	60	60	60	54	54	40	40	40	20	75	68	68	68	60	77	70	83	83	74
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.006	0.005	0.005	0.005	0.005	0.007	0.006	0.007	0.007	0.006
		RPM	19180	19180	19180	19180	19180	17049	17049	12787	12787	12787	6393	19945	17951	17951	17951	15956	17564	15808	17510	17510	15759
		FEED	192	192	192	192	192	136	136	102	102	102	38	239	180	180	180	160	246	190	245	245	189
		Ap	0.032	0.032	0.032	0.028	0.028	0.028	0.024	0.024	0.020	0.020	0.016	0.043	0.038	0.034	0.034	0.029	0.050	0.039	0.060	0.054	0.048
	39.2	Vc	46	46	46	46	46	41	41	31	31	31	15	57	51	51	51	45	60	54	62	62	56
		fz	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.005	0.005	0.005	0.005	0.004	0.005	0.005	0.006	0.006	0.005
		RPM	14753	14753	14753	14753	14753	13114	13114	9835	9835	9835	4918	15027	13524	13524	13524	12022	13583	12225	13184	13184	11866
		FEED	118	118	118	118	118	79	79	59	59	59	20	150	135	135	135	96	136	122	158	158	119
		Ap	0.032	0.032	0.032	0.028	0.028	0.028	0.024	0.024	0.020	0.020	0.016	0.043	0.038	0.034	0.034	0.029	0.050	0.039	0.060	0.054	0.048
	39.3	Vc	37	37	37	37	37	33	33	25	25	25	12	46	42	42	42	37	49	44	52	52	47
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.004	0.003	0.005	0.004	0.005	0.005	0.004
		RPM	11803	11803	11803	11803	11803	10491	10491	7868	7868	7868	3934	12295	11066	11066	11066	9836	11241	10117	11021	11021	9919
		FEED	71	71	71	71	71	63	63	31	31	31	16	98	89	89	89	59	112	81	110	110	79
		Ap	0.026	0.026	0.026	0.023	0.023	0.023	0.020	0.020	0.016	0.016	0.013	0.035	0.031	0.027	0.027	0.023	0.041	0.032	0.049	0.044	0.039
	40	Vc	111	111	111	111	111	99	99	74	74	74	37	139	125	125	125	111	144	130	154	154	139
		fz	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.005	0.009	0.008	0.008	0.008	0.007	0.010	0.009	0.010	0.010	0.009
		RPM	35409	35409	35409	35409	35409	31474	31474	23606	23606	23606	11803	36884	33196	33196	33196	29507	32786	29507	32754	32754	29479
		FEED	496	496	496	496	496	378	378	283	283	283	118	664	538	538	538	425	662	536	655	655	531
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051
	41	Vc	74	74	74	74	74	66	66	49	49	49	25	93	83	83	83	74	98	88	103	103	93
		fz	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.004	0.008	0.007	0.007	0.007	0.006	0.009	0.008	0.009	0.009	0.008
		RPM	23606	23606	23606	23606	23606	20983	20983	15737	15737	15737	7869	24589	22130	22130	22130	19671	22248	20023	21939	21939	19745
		FEED	283	283	283	283	283	252	252	157	157	157	63	393	310	310	310	236	400	320	395	395	316
		Ap	0.034	0.034	0.034	0.030	0.030	0.030	0.026	0.026	0.021	0.021	0.017	0.046	0.041	0.036	0.036	0.031	0.054	0.042	0.064	0.057	0.051

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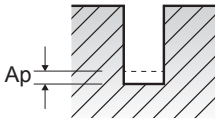

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			2	2	2	2	2	2	2	2	2	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3
			LBS	8	10	12	14	16	18	20	25	30	35	40	50	8	12	16	20	30	40	50	8	12
P	5	Vc	216	216	195	195	195	195	195	173	173	130	130	65	217	217	195	195	173	130	130	211	211
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.016	0.016	0.014	0.014	0.013	0.011	0.011	0.019	0.019
		RPM	34426	34426	30983	30983	30983	30983	30983	27541	27541	20656	20656	10328	27604	27604	24844	24844	22083	16562	16562	22404	22404
		FEED	895	895	744	744	744	744	744	551	551	372	372	165	883	883	696	696	574	364	364	851	851
		Ap	0.090	0.090	0.080	0.080	0.080	0.070	0.070	0.070	0.060	0.050	0.050	0.040	0.113	0.113	0.100	0.100	0.088	0.075	0.063	0.150	0.135
	8~9	Vc	216	216	195	195	195	195	195	173	173	130	130	65	217	217	195	195	173	130	130	211	211
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.016	0.016	0.014	0.014	0.013	0.011	0.011	0.019	0.019
		RPM	34426	34426	30983	30983	30983	30983	30983	27541	27541	20656	20656	10328	27604	27604	24844	24844	22083	16562	16562	22404	22404
		FEED	895	895	744	744	744	744	744	551	551	372	372	165	883	883	696	696	574	364	364	851	851
		Ap	0.090	0.090	0.080	0.080	0.080	0.070	0.070	0.070	0.060	0.050	0.050	0.040	0.113	0.113	0.100	0.100	0.088	0.075	0.063	0.150	0.135
	11.1	Vc	216	216	195	195	195	195	195	173	173	130	130	65	217	217	195	195	173	130	130	211	211
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.016	0.016	0.014	0.014	0.013	0.011	0.011	0.019	0.019
		RPM	34426	34426	30983	30983	30983	30983	30983	27541	27541	20656	20656	10328	27604	27604	24844	24844	22083	16562	16562	22404	22404
		FEED	895	895	744	744	744	744	744	551	551	372	372	165	883	883	696	696	574	364	364	851	851
		Ap	0.090	0.090	0.080	0.080	0.080	0.070	0.070	0.070	0.060	0.050	0.050	0.040	0.113	0.113	0.100	0.100	0.088	0.075	0.063	0.150	0.135
	11.2	Vc	170	170	153	153	153	153	153	136	136	102	102	51	170	170	153	153	136	102	102	170	170
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.017	0.017	0.015	0.015	0.013	0.012	0.012	0.020	0.020
		RPM	27049	27049	24344	24344	24344	24344	24344	21639	21639	16229	16229	8115	21630	21630	19467	19467	17304	12978	12978	18032	18032
		FEED	703	703	584	584	584	584	584	433	433	292	292	130	735	735	584	584	450	311	311	721	721
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115
H	38.1	Vc	170	170	153	153	153	153	153	136	136	102	102	51	170	170	153	153	136	102	102	170	170
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.017	0.017	0.015	0.015	0.013	0.012	0.012	0.020	0.020
		RPM	27049	27049	24344	24344	24344	24344	24344	21639	21639	16229	16229	8115	21630	21630	19467	19467	17304	12978	12978	18032	18032
		FEED	703	703	584	584	584	584	584	433	433	292	292	130	735	735	584	584	450	311	311	721	721
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115
	38.2	Vc	113	113	102	102	102	102	102	91	91	68	68	34	113	113	102	102	91	68	68	113	113
		fz	0.012	0.012	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.008	0.007	0.015	0.015	0.014	0.014	0.012	0.011	0.011	0.018	0.018
		RPM	18032	18032	16229	16229	16229	16229	16229	14426	14426	10819	10819	5410	14420	14420	12978	12978	11536	8652	8652	12021	12021
		FEED	433	433	357	357	357	357	357	289	289	173	173	76	433	433	363	363	277	190	190	433	433
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115
	39.1	Vc	93	93	83	83	83	83	83	74	74	56	56	28	93	93	84	84	74	56	56	93	93
		fz	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.007	0.007	0.006	0.006	0.005	0.011	0.011	0.010	0.010	0.009	0.008	0.008	0.014	0.014
		RPM	14754	14754	13279	13279	13279	13279	13279	11803	11803	8852	8852	4426	11845	11845	10661	10661	9476	7107	7107	9835	9835
		FEED	266	266	212	212	212	212	212	165	165	106	106	44	261	261	213	213	171	114	114	275	275
		Ap	0.072	0.072	0.064	0.064	0.064	0.056	0.056	0.056	0.048	0.040	0.040	0.032	0.090	0.090	0.080	0.080	0.070	0.060	0.050	0.120	0.108
	39.2	Vc	72	72	65	65	65	65	65	58	58	43	43	22	72	72	65	65	58	43	43	72	72
		fz	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.009	0.009	0.008	0.008	0.007	0.006	0.006	0.011	0.011
		RPM	11475	11475	10328	10328	10328	10328	10328	9180	9180	6885	6885	3443	9167	9167	8250	8250	7334	5500	5500	7650	7650
		FEED	161	161	124	124	124	124	124	110	110	69	69	28	165	165	132	132	103	66	66	168	168
		Ap	0.072	0.072	0.064	0.064	0.064	0.056	0.056	0.056	0.048	0.040	0.040	0.032	0.090	0.090	0.080	0.080	0.070	0.060	0.050	0.120	0.108
	39.3	Vc	62	62	56	56	56	56	56	49	49	37	37	19	62	62	56	56	50	37	37	62	62
		fz	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.008	0.008	0.007	0.007	0.006	0.005	0.005	0.009	0.009
		RPM	9835	9835	8852	8852	8852	8852	8852	7868	7868	5901	5901	2951	7931	7931	7138	7138	6345	4759	4759	6557	6557
		FEED	118	118	89	89	89	89	89	79	79	47	47	24	127	127	100	100	76	48	48	118	118
		Ap	0.059	0.059	0.052	0.052	0.052	0.046	0.046	0.046	0.039	0.033	0.033	0.026	0.073	0.073	0.065	0.065	0.057	0.049	0.041	0.098	0.088
	40	Vc	170	170	153	153	153	153	153	136	136	102	102	51	170	170	153	153	136	102	102	170	170
		fz	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.010	0.010	0.009	0.009	0.008	0.017	0.017	0.015	0.015	0.013	0.012	0.012	0.020	0.020
		RPM	27049	27049	24344	24344	24344	24344	24344	21639	21639	16229	16229	8115	21630	21630	19467	19467	17304	12978	12978	18032	18032
		FEED	703	703	584	584	584	584	584	433	433	292	292	130	735	735	584	584	450	311	311	721	721
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115
	41	Vc	113	113	102	102	102	102	102	91	91	68	68	34	113	113	102	102	91	68	68	113	113
		fz	0.012	0.012	0.011	0.011	0.011	0.011	0.011	0.010	0.010	0.008	0.008	0.007	0.015	0.015	0.014	0.014	0.012	0.011	0.011	0.018	0.018
		RPM	18032	18032	16229	16229	16229	16229	16229	14426	14426	10819	10819	5410	14420	14420	12978	12978	11536	8652	8652	12021	12021
		FEED	433	433	357	357	357	357	357	289	289	173	173	76	433	433	363	363	277	190	190	433	433
		Ap	0.077	0.077	0.068	0.068	0.068	0.060	0.060	0.060	0.051	0.043	0.043	0.034	0.096	0.096	0.085	0.085	0.074	0.064	0.053	0.128	0.115

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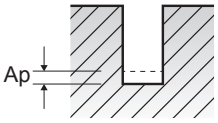


Global Cutting Tool Leader **YG-1**

MILLING

Leading Through Innovation

X5070 END MILLS

X5070 NANO-VHM - FRÄSER

- For High Hardened Steels (HRc45 to HRc70)
  High Speed Machining and Dry Cutting

- Für hochgehärtete Stähle (HRc45 bis HRc70)
  Hochgeschwindigkeitsbearbeitung und Trockenbearbeitung

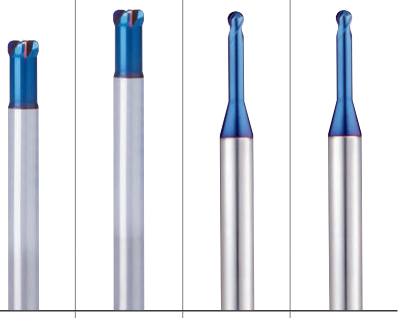
SELECTION GUIDE

YG MILLING TOOLS

SERIES	G8B59	G8B54	G8A46	G8A54
FLUTE	4	4	2	2
HELIX ANGLE	0°	0°	30°	30°
CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE
SIZE MIN	D2.0	D2.0	R0.05	R0.25
SIZE MAX	D12.0	D16.0	R2.0	R1.0
PAGE	C143	C144	C145	C149
	HIGH FEED	HIGH FEED LONG SHANK	RIB PROCESSING	RIB PROCESSING
	Blue Coating	Blue Coating	Blue Coating	Blue Coating

SOLID CARBIDE
X5070 END MILLS

High Hardened Steels HRc45 to HRc70,
High Speed Machining, Dry Cutting



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

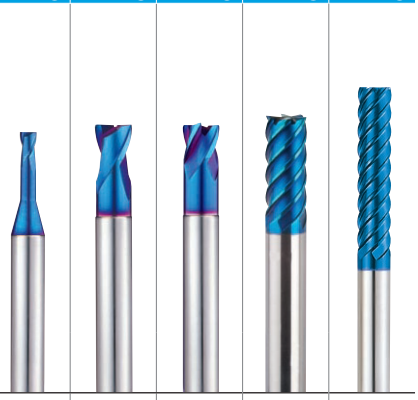
Recommended cutting conditions : p. C181

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125					
	2		About 0.45% C	Annealed	190	13				
	3		About 0.45% C	Quenched & Tempered	250	25				
	4		About 0.75% C	Annealed	270	28				
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	○
	6	Low alloy steel		Annealed	180	10				
	7			Quenched & Tempered	275	29				
	8			Quenched & Tempered	300	32	○	○	○	○
	9			Quenched & Tempered	350	38	○	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15				
	11			Quenched & Tempered	325	35	○	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55	◎	◎	◎	◎
	39			Hardened	630	60	◎	◎	◎	◎
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○
	41	Hardened Cast Iron		Hardened	550	55	◎	◎	◎	◎

SELECTION GUIDE

YG MILLING TOOLS

SERIES	G8A45	G8A01	G8A02	G8D63	G8D64
FLUTE	2	2	4	6&8	6&8
HELIX ANGLE	30°	30°	30°	45°	45°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D0.1	D0.2	D1.0	D6.0	D6.0
SIZE MAX	D4.0	D20.0	D20.0	D25.0	D25.0
PAGE	C169	C173	C174	C175	C176
	RIB PROCESSING	EXTENDED NECK	EXTENDED NECK	LONG LENGTH	EXTRA LONG LENGTH
	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating



SOLID CARBIDE
X5070 END MILLS

High Hardened Steels HRc45 to HRc70,
High Speed Machining, Dry Cutting

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C117

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc					
P	1	Non-alloy steel	About 0.15% C	Annealed	125						
	2		About 0.45% C	Annealed	190	13					
	3		About 0.45% C	Quenched & Tempered	250	25					
	4		About 0.75% C	Annealed	270	28					
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	○	○
	6	Low alloy steel		Annealed	180	10					
	7			Quenched & Tempered	275	29					
	8			Quenched & Tempered	300	32	○	○	○	○	○
	9			Quenched & Tempered	350	38	○	○	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15					
	11			Quenched & Tempered	325	35	○	○	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15					
	13		Martensitic	Quenched & Tempered	240	23					
	14		Austenitic		180	10					
K	15	Grey cast iron	Pearlitic / ferritic		180	10					
	16		Pearlitic (Martensitic)		260	26					
	17	Nodular cast iron	Ferritic		160	3					
	18		Pearlitic		250	25					
	19	Malleable cast iron	Ferritic		130						
	20		Pearlitic		230	21					
N	21	Aluminum-wrought alloy	Not Curable		60						
	22		Curable	Hardened	100						
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75						
	24		≤ 12% Si, Curable	Hardened	90						
	25		> 12% Si, Not Curable		130						
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						
	27		CuZn, CuSnZn (Brass)		90						
	28		CuSn, lead-free copper and electrolytic copper		100						
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm						
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55	◎	◎	◎	◎	◎
	39			Hardened	630	60	◎	◎	◎	◎	◎
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○	○
	41	Hardened Cast Iron		Hardened	550	55	◎	◎	◎	◎	◎

X5070 END MILLS

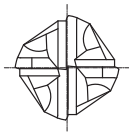
PLAIN SHANK **G8B54** SERIES

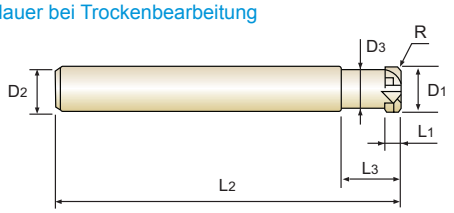
CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED (Long Shank)

VOLLHARTMETALL, 4 SCHNEIDEN EXTER KURZ ECKENRADIUS HOCHVORSCHUB
Fraise carbure, 4 dents, torique, grande avance, extra-courte
4 TAGLIENTI, TORICA EXTRA LUNGA

- Excellent wear resistance at heavy feed rates on high hardened material.
- Designed with reduced clearance angles and short flutes for strength.
- High hardness & heat resistance coating for long life in dry applications.

- Hervorragende Verschleißeigenschaften bei hohen Schnittwerten in gehärteten Materialien
- Mit reduzierten Freiwinkeln und kurzen Spannuten für hohe Festigkeiten konstruiert.
- Große Härte u. hitzebeständige Beschichtung für lange Lebensdauer bei Trockenbearbeitung





CARBIDE | 4 | 0° | R ±0.005 | PLAIN | BLUE

p.C177

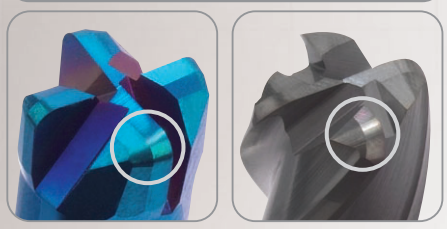
Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.005)	D1	D2	L1	L3	L2	D3
G8B5402005	R0.5	**2.0**	6	1	6	70	1.8
G8B5403005	R0.5	**3.0**	6	1.2	8	70	2.8
G8B5404005	R0.5	**4.0**	6	1.5	10	70	3.8
G8B5405005	R0.5	**5.0**	6	2	10	70	4.6
G8B5406005	R0.5	**6.0**	6	2.5	12	90	5.4
G8B5406010	R1.0	**6.0**	6	2.5	12	90	5.4
G8B5408010	R1.0	**8.0**	8	3.5	16	100	7.2
G8B5408020	R2.0	**8.0**	8	3.5	16	100	7.2
G8B5410010	R1.0	**10.0**	10	4	20	100	9
G8B5410020	R2.0	**10.0**	10	4	20	100	9
G8B5412020	R2.0	**12.0**	12	5	25	110	11
G8B5412030	R3.0	**12.0**	12	5	25	110	11
G8B5416030	R3.0	**16.0**	16	6.5	30	130	15

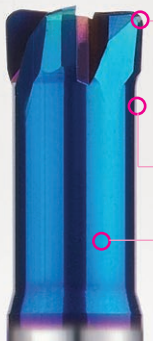
Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Mill Dia. Tolerance (mm)	Corner Radius Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.02	± 0.005	h5

Comparison of the endteeth shape



Hign Feed End Mill　　Normal End Mill



- Reduced clearance angles and short flutes strengthens corner radius and reduces chattering
- Extra-short flute length for high rigidity
- Heavy core with reduced diameter allows greater depths and maximum rigidity

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

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YG-1 CO., LTD.

X5070 END MILLS

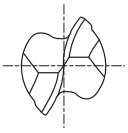
PLAIN SHANK **G8A46** SERIES

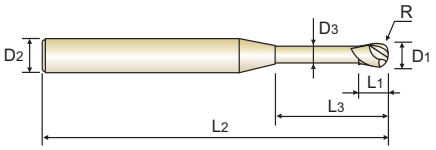
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, hémisphérique pour usinage de rainure
2 TAGLIENTI, SEMISFERICA, SCARICATA PER NERVATURE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finishes.
- Designed for high precision milling operation.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Exzellente Werkstückoberflächen.
- Geeignet für hochpräzises Fräsen.
- Höhere Verschleißfestigkeit.





CARBIDE | 2 | 30° | R ±0.005 | PLAIN | BLUE

p.C178~C179

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.005)	D1	D2	L1	L3	L2	D3
G8A46916	R0.3	0.6	4	0.5	6	45	0.55
G8A46917	R0.3	0.6	4	0.5	8	45	0.55
G8A46990	R0.3	0.6	4	0.5	10	45	0.55
G8A46918	R0.4	0.8	4	0.6	2	45	0.75
G8A46919	R0.4	0.8	4	0.6	4	45	0.75
G8A46008	R0.4	0.8	4	0.6	6	45	0.75
G8A46901	R0.4	0.8	4	0.6	8	45	0.75
G8A46965	R0.4	0.8	4	0.6	10	45	0.75
G8A46920	R0.5	1.0	4	0.8	3	45	0.95
G8A46921	R0.5	1.0	4	0.8	4	45	0.95
G8A46923	R0.5	1.0	4	0.8	5	45	0.95
G8A46010	R0.5	1.0	4	0.8	6	45	0.95
G8A46924	R0.5	1.0	4	0.8	7	45	0.95
G8A46902	R0.5	1.0	4	0.8	8	45	0.95
G8A46925	R0.5	1.0	4	0.8	9	45	0.95
G8A46903	R0.5	1.0	4	0.8	10	45	0.95
G8A46904	R0.5	1.0	4	0.8	12	45	0.95
G8A46926	R0.5	1.0	4	0.8	14	50	0.95
G8A46927	R0.5	1.0	4	0.8	16	50	0.95
G8A46966	R0.5	1.0	4	0.8	20	55	0.95
G8A46982	R0.6	1.2	4	1.0	6	45	1.15
G8A46012	R0.6	1.2	4	1.0	8	45	1.15

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

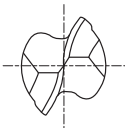
PLAIN SHANK **G8A46** SERIES

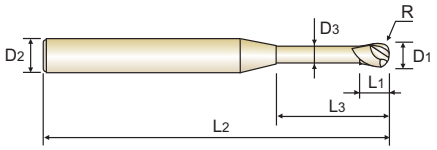
CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, hémisphérique pour usinage de rainure
2 TAGLIENTI, SEMISFERICA, SCARICATA PER NERVATURE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Geeignet für hochpräzises Fräsen.
- Höhere Verschleißfestigkeit.





CARBIDE | 2 | 30° | R ±0.005 | PLAIN | BLUE

p.C178~C179

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.005)	D1	D2	L1	L3	L2	D3
G8A46984	R1.5	3.0	6	2.4	14	55	2.85
G8A46030	R1.5	3.0	6	2.4	16	55	2.85
G8A46985	R1.5	3.0	6	2.4	18	60	2.85
G8A46911	R1.5	3.0	6	2.4	20	60	2.85
G8A46968	R1.5	3.0	6	2.4	25	65	2.85
G8A46969	R1.5	3.0	6	2.4	30	70	2.85
G8A46970	R1.5	3.0	6	2.4	35	80	2.85
G8A46950	R2.0	4.0	6	3.2	12	60	3.85
G8A46040	R2.0	4.0	6	3.2	16	60	3.85
G8A46912	R2.0	4.0	6	3.2	20	65	3.85
G8A46913	R2.0	4.0	6	3.2	25	70	3.85
G8A46971	R2.0	4.0	6	3.2	30	70	3.85
G8A46972	R2.0	4.0	6	3.2	35	80	3.85
G8A46973	R2.0	4.0	6	3.2	40	90	3.85
G8A46974	R2.0	4.0	6	3.2	45	90	3.85
G8A46975	R2.0	4.0	6	3.2	50	100	3.85

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

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YG-1 CO., LTD.

X5070 END MILLS

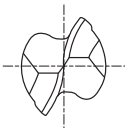
PLAIN SHANK **G8A28 SERIES**

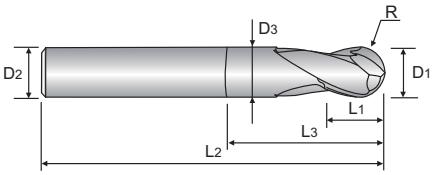
CARBIDE, 2 FLUTE BALL NOSE

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS
Fraise carbure, 2 dents, hémisphérique
2 TAGLIENTI, SEMISFERICA

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Geeignet für hochpräzises Fräsen.
- Höhere Verschleißfestigkeit.





CARBIDE | 2 | 30° | R ±0.005 (R0.05~R3) | R ±0.010 (R4~R6) | PLAIN | BLUE

p.C180~C181

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A28002	R0.1	0.2	4	0.3	-	40	-
G8A28003	R0.15	0.3	4	0.5	-	40	-
G8A28004	R0.2	0.4	4	0.6	-	40	-
G8A28005	R0.25	0.5	4	0.7	-	40	-
G8A28006	R0.3	0.6	4	0.9	-	40	-
G8A28007	R0.35	0.7	4	1.1	-	40	-
G8A28008	R0.4	0.8	4	1.2	-	40	-
G8A28009	R0.45	0.9	4	1.4	-	40	-
G8A280104S	R0.5	1.0	4	1.5	3	50	0.95
G8A28010	R0.5	1.0	6	1.5	3	50	0.95
G8A280154S	R0.75	1.5	4	2	4	50	1.45
G8A28015	R0.75	1.5	6	2	4	50	1.45
G8A280204S	R1.0	2.0	4	2.5	5	50	1.95
G8A28020	R1.0	2.0	6	2.5	5	50	1.95
G8A28025	R1.25	2.5	6	3	7	50	2.4
G8A28030	R1.5	3.0	6	4	10	60	2.85
G8A28035	R1.75	3.5	6	4.5	10	60	3.35
G8A28040	R2.0	4.0	6	5	10	60	3.85
G8A28045	R2.25	4.5	6	5.5	10	60	4.35
G8A28050	R2.5	5.0	6	6	12	60	4.85

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

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YG-1 CO., LTD.

X5070 END MILLS

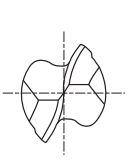
PLAIN SHANK **G8A38** SERIES

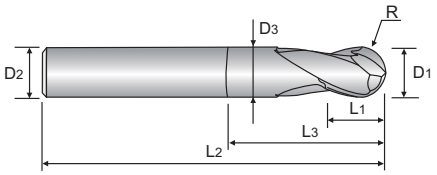
CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN EXTRA KURZ STIRNRADIUS mit ABGESETZTEM SCHAFTTEIL
Fraise carbure, 2 dents, hémisphérique, détalonnée, extra-courte
2 TAGLIENTI, SEMISFERICA TAGLIENTE CORTO CON SCARICO ESTESO

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Geeignet für hochpräzises Fräsen.
- Höhere Verschleißfestigkeit.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | BLUE

R0.5~R3 R3.5~R12.5

p.C180~C181

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
G8A38010	R0.5	1.0	4	1	2.2	50	0.95
G8A38012	R0.6	1.2	4	1.2	2.6	50	1.15
G8A38015	R0.75	1.5	4	1.5	3	50	1.45
G8A380204S	R1.0	2.0	4	2	4	50	1.95
G8A38020	R1.0	2.0	6	2	4	50	1.95
G8A38030	R1.5	3.0	6	3	6	60	2.85
G8A38040	R2.0	4.0	6	4	8	70	3.85
G8A38050	R2.5	5.0	6	5	10	80	4.85
G8A38060	R3.0	6.0	6	6	12	90	5.85
G8A38070	R3.5	7.0	8	7	14	90	6.7
G8A38080	R4.0	8.0	8	8	16	100	7.7
G8A38090	R4.5	9.0	10	9	18	100	8.7
G8A38100	R5.0	10.0	10	10	20	100	9.7
G8A38120	R6.0	12.0	12	12	24	110	11.7
G8A38140	R7.0	14.0	14	14	28	110	13.7
G8A38180	R9.0	18.0	18	18	36	140	17.7
G8A38200	R10.0	20.0	20	20	40	160	19.7
G8A38250	R12.5	25.0	25	25	50	180	24.7

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

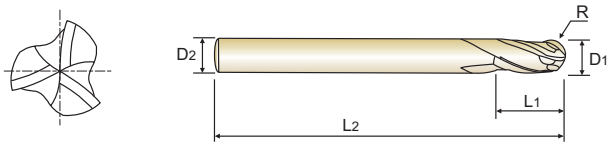
PLAIN SHANK **G8A59** SERIES

CARBIDE, 3 FLUTE BALL NOSE - Center Match

VOLLHARTMETALL, 3 SCHNEIDEN STIRNRADIUS - Schneiden Mittelpunkt
Fraise carbure, 3 dents, hémisphérique, coupe au centre
3 TAGLIENTI, SEMISFERICA

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Geeignet für hochpräzises Fräsen.
- Höhere Verschleißfestigkeit.



CARBIDE | 3 | 30° | R ±0.005 (R1.5~R3) | R ±0.010 (R4~R10) | PLAIN | BLUE

p.C182

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
G8A59030	R1.5	**3.0**	6	8	60
G8A59040	R2.0	**4.0**	6	8	70
G8A59050	R2.5	**5.0**	6	10	80
G8A59060	R3.0	**6.0**	6	12	90
G8A59080	R4.0	**8.0**	8	14	100
G8A59100	R5.0	**10.0**	10	18	100
G8A59120	R6.0	**12.0**	12	22	110
G8A59160	R8.0	**16.0**	16	30	140
G8A59200	R10.0	**20.0**	20	38	160

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

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YG-1 CO., LTD.

X5070 END MILLS

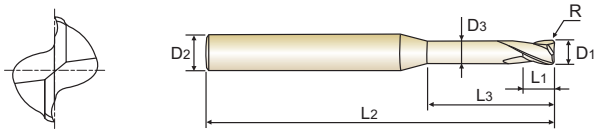
PLAIN SHANK **G8A60** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, torique pour usinage de rainure
2 TAGLIENTI, TORICA, SCARICATA PER ENRVATURE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Abgesetzter Schaft für größere Reichweite.
- Schneidkantenschutz durch definierten Radius.
- Höhere Verschleißfestigkeit.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.5~Ø6) | R ±0.015 (Ø8~Ø12) | PLAIN | BLUE

p.C184~C185

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A60936	R0.05	0.5	4	0.7	1.5	45	0.45
G8A60932	R0.05	0.5	4	0.7	2.5	45	0.45
G8A60935	R0.05	0.5	4	0.7	4	45	0.45
G8A60931	R0.05	0.6	4	0.9	2	45	0.55
G8A60933	R0.05	0.6	4	0.9	3	45	0.55
G8A60934	R0.05	0.6	4	0.9	4	45	0.55
G8A600060102	R0.1	0.6	4	0.9	2	45	0.55
G8A600070104	R0.1	0.7	4	1	4	45	0.65
G8A600080102	R0.1	0.8	4	1.2	2	45	0.75
G8A60008	R0.1	0.8	4	1.2	4	45	0.75
G8A60924	R0.1	0.8	4	1.2	6	45	0.75
G8A609254S	R0.1	1.0	4	1.5	4	50	0.95
G8A609264S	R0.1	1.0	4	1.5	6	50	0.95
G8A609114S	R0.2	1.0	4	1.5	8	50	0.95
G8A600100304	R0.3	1.0	4	1.5	4	50	0.95
G8A60980	R0.3	1.0	4	1.5	8	50	0.95
G8A60925	R0.1	1.0	6	1.5	4	50	0.95
G8A60926	R0.1	1.0	6	1.5	6	50	0.95
G8A60010	R0.2	1.0	6	1.5	4	50	0.95
G8A60910	R0.2	1.0	6	1.5	6	50	0.95
G8A60911	R0.2	1.0	6	1.5	8	50	0.95
G8A60912	R0.3	1.0	6	1.5	4	50	0.95

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

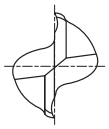
PLAIN SHANK **G8A60 SERIES**

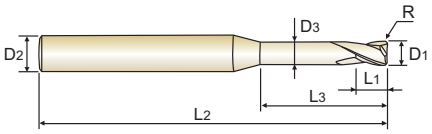
CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, torique pour usinage de rainure
2 TAGLIENTI, TORICA, SCARICATA PER ENRVATURE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Abgesetzter Schaft für größere Reichweite.
- Schneidkantenschutz durch definierten Radius.
- Höhere Verschleißfestigkeit.





CARBIDE | 2 | 30° | R ±0.010 (Ø0.5~Ø6) | R ±0.015 (Ø8~Ø12) | PLAIN | BLUE

p.C184~C185

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A60927	R0.2	2.0	6	3	6	50	1.95
G8A600200208	R0.2	2.0	6	3	8	50	1.95
G8A600200210	R0.2	2.0	6	3	10	55	1.95
G8A600200212	R0.2	2.0	6	3	12	55	1.95
G8A60916	R0.3	2.0	6	3	6	50	1.95
G8A600200308	R0.3	2.0	6	3	8	50	1.95
G8A600200310	R0.3	2.0	6	3	10	55	1.95
G8A600200312	R0.3	2.0	6	3	12	55	1.95
G8A600200316	R0.3	2.0	6	3	16	55	1.95
G8A60917	R0.5	2.0	6	3	6	50	1.95
G8A60020	R0.5	2.0	6	3	10	55	1.95
G8A60918	R0.5	2.0	6	3	12	55	1.95
G8A600300208	R0.2	3.0	6	4	8	55	2.85
G8A600300210	R0.2	3.0	6	4	10	55	2.85
G8A600300212	R0.2	3.0	6	4	12	55	2.85
G8A600300216	R0.2	3.0	6	4	16	55	2.85
G8A600300308	R0.3	3.0	6	4	8	55	2.85
G8A60919	R0.3	3.0	6	4	10	55	2.85
G8A600300312	R0.3	3.0	6	4	12	55	2.85
G8A600300316	R0.3	3.0	6	4	16	55	2.85
G8A60030	R0.5	3.0	6	4	10	55	2.85
G8A600300512	R0.5	3.0	6	4	12	55	2.85

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

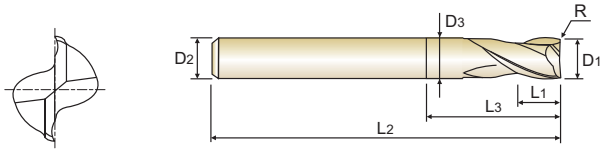
PLAIN SHANK **G8A60 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, torique pour usinage de rainure
2 TAGLIENTI, TORICA, SCARICATA PER ENRVATURE

- ▶ Designed to machine high hardened materials.
- ▶ Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- ▶ Excellent workpiece finish.
- ▶ Deep slotting is possible by reduced neck.
- ▶ Corner radius for preventing the chipping in high speed machining.
- ▶ Higher wear-resistance.

- ▶ Geeignet zum Fräsen hochgehärteter Stähle.
- ▶ Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- ▶ Excellente Werkstückoberflächen.
- ▶ Abgesetzter Schaft für größere Reichweite.
- ▶ Schneidkantenschutz durch definierten Radius.
- ▶ Höhere Verschleißfestigkeit.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.5~Ø6) | R ±0.015 (Ø8~Ø12) | PLAIN | BLUE

p.C184~C185

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A60907	R1.5	**8.0**	8	9	25	60	7.7
G8A600802025	R2.0	**8.0**	8	9	25	60	7.7
G8A60923	R0.3	**10.0**	10	11	32	70	9.7
G8A601000532	R0.5	**10.0**	10	11	32	70	9.7
G8A60100	R1.0	**10.0**	10	11	32	70	9.7
G8A60908	R1.5	**10.0**	10	11	32	70	9.7
G8A601002032	R2.0	**10.0**	10	11	32	70	9.7
G8A601200538	R0.5	**12.0**	12	12	38	80	11.7
G8A60120	R1.0	**12.0**	12	12	38	80	11.7
G8A60909	R1.5	**12.0**	12	12	38	80	11.7
G8A601202038	R2.0	**12.0**	12	12	38	80	11.7

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

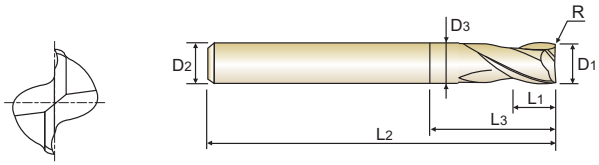
PLAIN SHANK **G8A36** SERIES

CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN EXTRA KURZ ECKENRADIUS mit ABGESETZTEM SCHAFTTEIL
Fraise carbure, 2 dents, torique, détalonnée, extra-courte
2 TAGLIENTI, TORICA, TAGLIENTE CORTO CON SARICO ESTESO

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Abgesetzter Schaft für größere Reichweite.
- Schneidkantenschutz durch definierten Radius.
- Höhere Verschleißfestigkeit.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.3~Ø6) | R ±0.015 (Ø8~Ø20) | PLAIN | BLUE

p.C191-193

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A36040	R0.1	4.0	6	5	9	45	3.85
G8A36045	R0.1	4.5	6	6	10	45	4.35
G8A36050	R0.2	5.0	6	6	11	50	4.85
G8A36060	R0.2	6.0	6	7	14	50	5.85
G8A36080	R0.2	8.0	8	9	18	60	7.7
G8A36100	R0.2	10.0	10	12	25	75	9.7
G8A36120	R0.3	12.0	12	15	30	75	11.7
G8A36200	R0.3	20.0	20	24	45	100	19.7

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

X5070 END MILLS

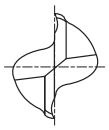
PLAIN SHANK **G8A50 SERIES**

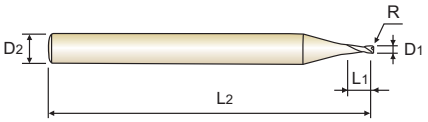
CARBIDE, 2 FLUTE MINIATURE CORNER RADIUS

VOLLHARTMETALL, 2 SCHNEIDEN MINI ECKENRADIUS
Fraise carbure, 2 dents, torique, micro-fraise
2 TAGLIENTI, TORICA MINI

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Abgesetzter Schaft für größere Reichweite.
- Schneidkantenschutz durch definierten Radius.
- Höhere Verschleißfestigkeit.





CARBIDE | 2 | 30° | R ±0.010 | PLAIN | BLUE

p.C187

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±0.010)	D1	D2	L1	L2
G8A50003	-	0.3	6	0.45	50
G8A50004	-	0.4	6	0.6	50
G8A50005	R0.05	0.5	6	0.7	50
G8A50006	R0.05	0.6	6	0.9	50
G8A50008	R0.05	0.8	6	1.2	50
G8A50010	R0.10	1.0	6	1.5	50
G8A50012	R0.10	1.2	6	1.8	50
G8A50015	R0.15	1.5	6	2.2	50
G8A50020	R0.15	2.0	6	2.2	50

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

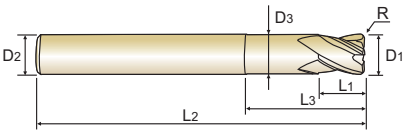
PLAIN SHANK **G8A37** SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN EXTRA KURZ ECKENRADIUS mit ABGESETZTEM SCHAFTTEIL
Fraise carbure, 4 dents, torique, détalonnée, extra-courte
4 TAGLIENTI, TORICA, TAGLIENTE CORTO CON SCARICO ESTESO

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Abgesetzter Schaft für größere Reichweite.
- Schneidkantenschutz durch definierten Radius.
- Höhere Verschleißfestigkeit.



CARBIDE | 4 | 30° | R ±0.010 (Ø1~Ø6) | R ±0.015 (Ø8~Ø20) | PLAIN | BLUE

p.C194

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A37010	R0.1	1.0	3	1.5	-	40	-
G8A37901	R0.1	1.0	6	1.5	-	40	-
G8A37015	R0.1	1.5	3	2.2	-	40	-
G8A37902	R0.1	1.5	6	2.2	-	40	-
G8A37020	R0.1	2.0	3	3	6	40	1.95
G8A37903	R0.1	2.0	6	3	6	40	1.95
G8A37025	R0.1	2.5	3	4	6	40	2.4
G8A37904	R0.1	2.5	6	4	6	40	2.4
G8A37030	R0.1	3.0	6	4	7	45	2.85
G8A37035	R0.1	3.5	6	5	9	45	3.35
G8A37040	R0.1	4.0	6	5	9	45	3.85
G8A37045	R0.1	4.5	6	6	10	45	4.35
G8A37050	R0.2	5.0	6	6	11	50	4.85
G8A37060	R0.2	6.0	6	7	14	50	5.85
G8A37080	R0.2	8.0	8	9	18	60	7.7
G8A37100	R0.2	10.0	10	12	25	75	9.7
G8A37120	R0.3	12.0	12	15	30	75	11.7
G8A37160	R0.3	16.0	16	18	38	90	15.7
G8A37200	R0.3	20.0	20	24	45	100	19.7

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

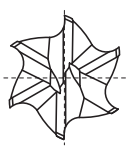
PLAIN SHANK **G8A39 SERIES**

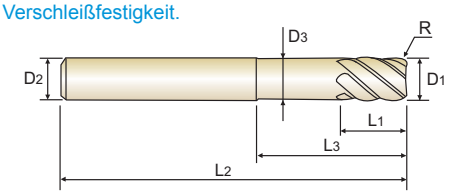
CARBIDE, 6 FLUTE 45° HELIX CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 6 SCHNEIDEN 45° RECHTSSPIRALE ECKENRADIUS mit ABGESETZTEM SCHAFTTEIL
Fraise carbure, 6 dents, torique, hélice 45°, détalonnée
6 TAGLIENTI, TORICA, ELICA 45°, SCARICATA

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Abgesetzter Schaft für größere Reichweite.
- Schneidkantenschutz durch definierten Radius.
- Höhere Verschleißfestigkeit.





CARBIDE | 6 | 45° | R ±0.010 Ø6 | R ±0.015 Ø8~Ø20 | PLAIN | BLUE p.C195

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A39916	R0.25	6.0	6	6	14	50	5.85
G8A39060	R0.5	6.0	6	6	14	50	5.85
G8A39901	R0.5	6.0	6	13	-	70	-
* G8A39910	R0.5	6.0	6	26	-	70	-
G8A39080	R0.5	8.0	8	8	24	60	7.7
G8A39902	R0.5	8.0	8	19	-	90	-
* G8A39911	R0.5	8.0	8	36	-	90	-
G8A39903	R0.5	10.0	10	22	-	100	-
G8A39100	R1.0	10.0	10	10	30	70	9.7
G8A39904	R1.0	10.0	10	22	-	100	-
* G8A39912	R1.0	10.0	10	46	-	100	-
G8A39905	R0.5	12.0	12	26	-	110	-
G8A39120	R1.0	12.0	12	12	30	75	11.7
G8A39906	R1.0	12.0	12	26	-	110	-
* G8A39913	R1.0	12.0	12	56	-	110	-
G8A39160	R1.0	16.0	16	32	-	130	-
G8A39907	R1.5	16.0	16	32	-	130	-
* G8A39914	R1.5	16.0	16	66	-	130	-
G8A39200	R1.0	20.0	20	38	-	140	-
G8A39908	R1.5	20.0	20	38	-	140	-
G8A39909	R2.0	20.0	20	38	-	140	-
* G8A39915	R2.0	20.0	20	76	-	140	-

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

* Mill Dia. Tolerance(mm) for Extra Long Type : 0~-0.03

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

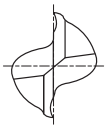
PLAIN SHANK **G8A45** SERIES

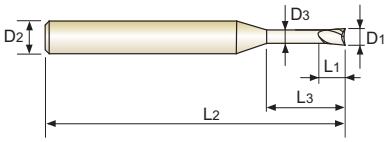
CARBIDE, 2 FLUTE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN für SCHMALE RIPPEN
Fraise carbure, 2 dents pour usinage de rainure
2 TAGLIENTI PER NERVATURE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Geeignet für hochpräzises Fräsen.
- Höhere Verschleißfestigkeit.





CARBIDE | 2 | 30° | PLAIN | BLUE

p.C189~C190

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A45992	0.6	4	0.9	6	45	0.55
G8A45819	0.6	4	0.9	10	45	0.55
G8A45862	0.8	4	1.2	2	45	0.75
G8A45008	0.8	4	1.2	4	45	0.75
G8A45908	0.8	4	1.2	6	45	0.75
G8A45909	0.8	4	1.2	8	45	0.75
G8A45994	0.8	4	1.2	10	45	0.75
G8A45995	0.8	4	1.2	12	45	0.75
G8A45996	1.0	4	1.5	4	45	0.95
G8A45010	1.0	4	1.5	6	45	0.95
G8A45912	1.0	4	1.5	8	45	0.95
G8A45913	1.0	4	1.5	10	45	0.95
G8A45914	1.0	4	1.5	12	45	0.95
G8A45997	1.0	4	1.5	16	50	0.95
G8A45998	1.0	4	1.5	20	55	0.95
G8A45012	1.2	4	1.8	6	45	1.15
G8A45915	1.2	4	1.8	8	45	1.15
G8A45916	1.2	4	1.8	10	45	1.15
G8A45917	1.2	4	1.8	12	45	1.15
G8A45999	1.2	4	1.8	16	50	1.15

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

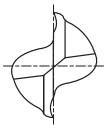
PLAIN SHANK **G8A45** SERIES

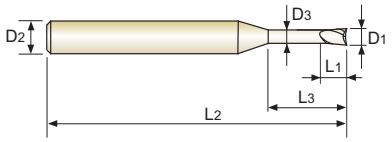
CARBIDE, 2 FLUTE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN für SCHMALE RIPPEN
Fraise carbure, 2 dents pour usinage de rainure
2 TAGLIENTI PER NERVATURE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Geeignet für hochpräzises Fräsen.
- Höhere Verschleißfestigkeit.





CARBIDE | 2 | 30° | PLAIN | BLUE

p.C189~C190

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
G8A45979	3.0	6	4.5	18	55	2.85
G8A45980	3.0	6	4.5	20	60	2.85
G8A45981	3.0	6	4.5	25	65	2.85
G8A45832	3.0	6	4.5	30	70	2.85
G8A45833	3.0	6	4.5	35	80	2.85
G8A45983	3.0	6	4.5	40	90	2.85
G8A45040	4.0	6	6	12	50	3.85
G8A45801	4.0	6	6	16	60	3.85
G8A45802	4.0	6	6	20	60	3.85
G8A45803	4.0	6	6	25	70	3.85
G8A45834	4.0	6	6	30	70	3.85
G8A45835	4.0	6	6	35	80	3.85
G8A45836	4.0	6	6	40	90	3.85
G8A45837	4.0	6	6	45	90	3.85
G8A45838	4.0	6	6	50	100	3.85

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

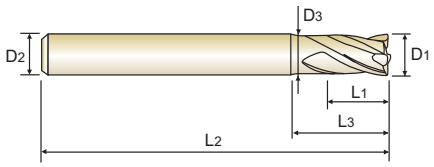
PLAIN SHANK **G8A02 SERIES**

CARBIDE, 4 FLUTE with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN mit ABGESETZTEM SCHAFTTEIL
Fraise carbure, 4 dents, détalonnée
4 TAGLIENTI CON SCARICO ESTESO

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.

- Geeignet zum Fräsen hochgehärteter Stähle.
- Geeignet zum Trockenfräsen und HSC-Fräsen dank neuentwickeltem Material und Beschichtung.
- Excellente Werkstückoberflächen.
- Geeignet für hochpräzises Fräsen.
- Höhere Verschleißfestigkeit.



CARBIDE | 4 | 30° | PLAIN | BLUE

p.C194

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G8A02010	1.0	6	1.5	3	50	0.95
G8A02020	2.0	6	2	5	50	1.95
G8A02030	3.0	6	3	8	55	2.85
G8A02040	4.0	6	4	10	55	3.85
G8A02050	5.0	6	5	13	55	4.85
G8A02060	6.0	6	6	15	55	5.85
G8A02080	8.0	8	8	20	65	7.7
G8A02100	10.0	10	10	25	75	9.7
G8A02120	12.0	12	12	28	85	11.7
G8A02160	16.0	16	16	32	90	15.7
G8A02200	20.0	20	20	40	105	19.7

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0 ~ - 0.012	h5
over Ø6	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

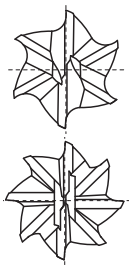
PLAIN SHANK **G8D64 SERIES**

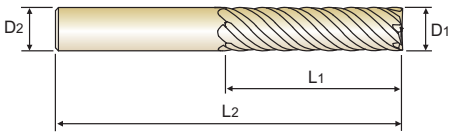
CARBIDE, 6&8 FLUTE 45° HELIX EXTRA LONG LENGTH

VOLLHARTMETALL, 6&8 SCHNEIDEN 45° RECHTSSPIRALE EXTRA LANG
Fraise carbure, 6&8 dents, hélice 45°, extra-longue
6&8 TAGLIENTI, ELICA 45°, TAGLIENTE EXTRA LUNGO

- Designed to machine high hardened materials.
- Designed for high abrasion resistance thanks to negative rake angle.
- Excellent side-cutting of press mold field.

- Speziell ausgelegt für die Hartbearbeitung
- Ausgelegt für hohe Abriebfestigkeit dank der negativen Spanwinkel.
- Hervorragend geeignet für die Seitenbearbeitung im Formenbau





CARBIDE | 6&8 | 45° | PLAIN | BLUE

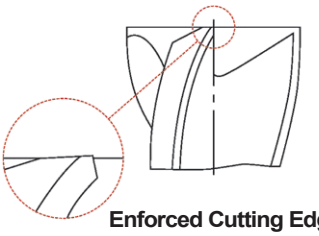
p.C197

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
G8D64060	6.0	6	26	70	6
G8D64080	8.0	8	36	90	6
G8D64100	10.0	10	46	100	6
G8D64120	12.0	12	56	110	6
G8D64160	16.0	16	66	130	6
G8D64200	20.0	20	76	140	8
G8D64250	25.0	25	92	180	8

Due to the characteristics of the blue decoration layer, it might be erased during short term use and the color layer might not be uniformed. However, it doesn't affect the performance of the tool.

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		◎	◎	○	◎

X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A46, G8A54 SERIES — 2 FLUTE BALL NOSE FOR RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.2	0.3	0.4	0.5	0.6
P	5	Non-alloy steel	Vc	31	45~47	60~63	50~55	50~56
			fz	0.003~0.004	0.005~0.005	0.007~0.008	0.006~0.013	0.007~0.015
			RPM	50000	48000~50000	48000~50000	31900~35200	26400~29700
			FEED	265~310	440~460	450~550	450~540	440~540
			Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034
	8-9	Low alloy steel	Vc	31	45~47	60~63	54~78	54~77
			fz	0.003~0.004	0.005~0.005	0.007~0.008	0.006~0.013	0.007~0.015
			RPM	50000	48000~50000	48000~50000	34100~49500	28600~40700
			FEED	300~350	480~520	720~790	600~870	590~850
			Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034
	11.1 - 11.2	High alloyed steel, and tool steel	Vc	31	45~47	60~63	54~78	54~77
			fz	0.003~0.004	0.005~0.005	0.007~0.008	0.006~0.013	0.007~0.015
			RPM	50000	48000~50000	48000~50000	34100~49500	28600~40700
			FEED	300~350	480~520	720~790	600~870	590~850
			Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034
H	38.1 - 38.2	Hardened steel	Vc	31	45~47	60~63	50~55	50~56
			fz	0.003~0.003	0.004~0.005	0.005~0.006	0.006~0.008	0.007~0.010
			RPM	50000	48000~50000	48000~50000	31900~35200	26400~29700
			FEED	265~310	440~460	450~550	450~540	440~540
			Ap	0.005~0.013	0.008~0.014	0.011~0.026	0.005~0.023	0.006~0.028
	39.1		Vc	31	43~47	58~63	50~55	50~56
			fz	0.009~0.011	0.017~0.017	0.017~0.018	0.028~0.027	0.030~0.032
			RPM	50000	46000~50000	46000~50000	31900~35200	26400~29700
			FEED	225~265	390~420	400~460	440~480	400~480
			Ap	0.005~0.012	0.007~0.013	0.010~0.024	0.005~0.021	0.006~0.025
	39.2		Vc	31	43~47	58~63	50~55	50~56
			fz	0.009~0.011	0.017~0.017	0.017~0.018	0.028~0.027	0.030~0.032
			RPM	50000	46000~50000	46000~50000	31900~35200	26400~29700
			FEED	225~265	390~420	400~460	440~480	400~480
			Ap	0.005~0.012	0.007~0.013	0.010~0.024	0.005~0.021	0.006~0.025
	40	Chilled Cast Iron	Vc	31	45~47	60~63	54~78	54~77
			fz	0.003~0.004	0.005~0.005	0.007~0.008	0.006~0.013	0.007~0.015
			RPM	50000	48000~50000	48000~50000	34100~49500	28600~40700
			FEED	300~350	480~520	720~790	600~870	590~850
			Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034
	41	Hardened Cast Iron	Vc	31	45~47	60~63	50~55	50~56
			fz	0.003~0.003	0.004~0.005	0.005~0.006	0.006~0.008	0.007~0.010
			RPM	50000	48000~50000	48000~50000	31900~35200	26400~29700
			FEED	265~310	440~460	450~550	450~540	440~540
			Ap	0.005~0.013	0.008~0.014	0.011~0.026	0.005~0.023	0.006~0.028

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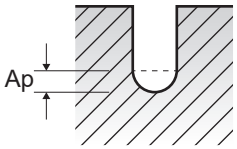

X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A28, G8A38, G8A53 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.2	0.3	0.4	0.5	0.6	0.8	1.0
P	5	Non-alloy steel	0.05D	0.02D	Vc	30	45	65	80	95	125	155
					fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048
					RPM	47746	47746	51725	50930	50399	49736	49338
					FEED	1146	1432	1966	2445	2923	3879	4736
	8-9	Low alloy steel	0.05D	0.02D	Vc	30	45	65	80	95	125	155
					fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048
					RPM	47746	47746	51725	50930	50399	49736	49338
					FEED	1146	1432	1966	2445	2923	3879	4736
	11.1	High alloyed steel, and tool steel	0.05D	0.02D	Vc	30	45	65	80	95	125	155
					fz	0.012	0.015	0.019	0.024	0.029	0.039	0.048
					RPM	47746	47746	51725	50930	50399	49736	49338
					FEED	1146	1432	1966	2445	2923	3879	4736
	11.2		0.05D	0.02D	Vc	30	45	65	80	95	125	155
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042
					RPM	47746	47746	51725	50930	50399	49736	49338
					FEED	1050	1337	1759	2139	2520	3283	4144
H	38.1	Hardened steel	0.05D	0.02D	Vc	30	45	65	80	95	125	155
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042
					RPM	47746	47746	51725	50930	50399	49736	49338
					FEED	1050	1337	1759	2139	2520	3283	4144
	38.2		0.05D	0.02D	Vc	30	40	55	70	85	115	140
					fz	0.011	0.013	0.017	0.021	0.024	0.033	0.042
					RPM	47746	42441	43768	44563	45094	45757	44563
					FEED	1050	1103	1488	1872	2165	3020	3743
	39.1		0.05D	0.02D	Vc	25	40	50	65	75	100	125
					fz	0.01	0.012	0.015	0.019	0.023	0.03	0.038
					RPM	39789	42441	39789	41380	39789	39789	39789
					FEED	796	1019	1194	1572	1830	2387	3024
	39.2		0.05D	0.02D	Vc	20	35	45	55	65	90	110
					fz	0.01	0.012	0.015	0.019	0.023	0.03	0.037
					RPM	31831	37136	35810	35014	34484	35810	35014
					FEED	637	891	1074	1331	1586	2149	2591
	39.3		0.05D	0.02D	Vc	20	30	40	50	60	80	110
					fz	0.009	0.011	0.014	0.017	0.022	0.029	0.033
					RPM	31831	31831	31831	31831	31831	31831	35014
					FEED	573	700	891	1082	1401	1846	2311
	40	Chilled Cast Iron	0.05D	0.02D	Vc	30	45	65	80	95	125	155
					fz	0.011	0.014	0.017	0.021	0.025	0.033	0.042
					RPM	47746	47746	51725	50930	50399	49736	49338
					FEED	1050	1337	1759	2139	2520	3283	4144
	41	Hardened Cast Iron	0.05D	0.02D	Vc	30	40	55	70	85	115	140
					fz	0.011	0.013	0.017	0.021	0.024	0.033	0.042
					RPM	47746	47746	51725	50930	50399	49736	49338
					FEED	1050	1337	1759	2139	2520	3283	4144

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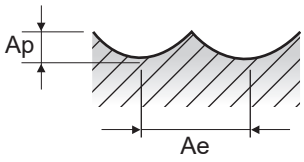


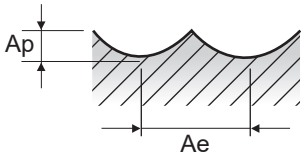
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A59 SERIES — **3 FLUTE BALL NOSE**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	5	Non-alloy steel	0.05D	0.02D	Vc	300	305	315	340	340	340	340	335	340
					fz	0.09	0.107	0.121	0.159	0.181	0.202	0.225	0.229	0.222
					RPM	31831	24271	20054	18038	13528	10823	9019	6665	5411
					FEED	8594	7791	7279	8604	7346	6558	6088	4579	3604
	8-9	Low alloy steel	0.05D	0.02D	Vc	300	305	315	340	340	340	340	335	340
					fz	0.09	0.107	0.121	0.159	0.181	0.202	0.225	0.229	0.222
					RPM	31831	24271	20054	18038	13528	10823	9019	6665	5411
					FEED	8594	7791	7279	8604	7346	6558	6088	4579	3604
	11.1 - 11.2	High alloyed steel, and tool steel	0.05D	0.02D	Vc	300	305	315	340	340	340	340	335	340
					fz	0.09	0.107	0.121	0.159	0.181	0.202	0.225	0.229	0.222
					RPM	31831	24271	20054	18038	13528	10823	9019	6665	5411
					FEED	8594	7791	7279	8604	7346	6558	6088	4579	3604
H	38.1 - 38.2	Hardened steel	0.05D	0.02D	Vc	255	255	265	285	285	285	285	285	285
					fz	0.072	0.09	0.108	0.136	0.155	0.168	0.187	0.19	0.192
					RPM	27056	20292	16870	15120	11340	9072	7560	5670	4536
					FEED	5844	5479	5466	6169	5273	4572	4241	3232	2613
	39.1		0.05D	0.02D	Vc	185	185	195	230	230	230	230	230	230
					fz	0.072	0.087	0.099	0.123	0.144	0.156	0.173	0.18	0.18
					RPM	19629	14722	12414	12202	9151	7321	6101	4576	3661
					FEED	4240	3842	3687	4502	3953	3426	3166	2471	1977
	39.2		0.05D	0.02D	Vc	175	180	185	210	210	210	210	210	205
					fz	0.072	0.086	0.099	0.115	0.134	0.144	0.145	0.144	0.145
					RPM	18568	14324	11777	11141	8356	6685	5570	4178	3263
					FEED	4011	3696	3498	3844	3359	2888	2423	1805	1419
	39.3		0.05D	0.02D	Vc	120	120	125	145	145	145	145	145	145
					fz	0.072	0.087	0.099	0.108	0.125	0.144	0.144	0.144	0.143
					RPM	12732	9549	7958	7692	5769	4615	3846	2885	2308
					FEED	2750	2492	2363	2492	2164	1994	1662	1246	990
	40	Chilled Cast Iron	0.05D	0.02D	Vc	300	305	315	340	340	340	340	335	340
					fz	0.09	0.107	0.121	0.159	0.181	0.202	0.225	0.229	0.222
					RPM	31831	24271	20054	18038	13528	10823	9019	6665	5411
					FEED	8594	7791	7279	8604	7346	6558	6088	4579	3604
	41	Hardened Cast Iron	0.05D	0.02D	Vc	255	255	265	285	285	285	285	285	285
					fz	0.072	0.09	0.108	0.136	0.155	0.168	0.187	0.19	0.192
					RPM	27056	20292	16870	15120	11340	9072	7560	5670	4536
					FEED	5844	5479	5466	6169	5273	4572	4241	3232	2613



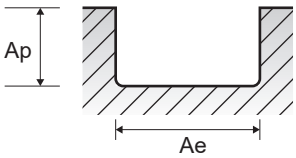
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A60 SERIES — **2 FLUTE CORNER RADIUS - SLOTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.5	0.6	0.8	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	5	Non-alloy steel	1.0D	0.05D	Vc	80	95	125	150	210	205	210	245	245	250	245	250
					fz	0.001	0.002	0.002	0.006	0.01	0.015	0.021	0.026	0.029	0.037	0.043	0.051
					RPM	50930	50399	49736	47746	33423	21751	16711	15597	12998	9947	7799	6631
					FEED	102	202	199	573	668	653	702	811	754	736	671	676
	8-9	Low alloy steel	1.0D	0.05D	Vc	80	95	125	150	210	205	210	245	245	250	245	250
					fz	0.001	0.002	0.002	0.006	0.01	0.015	0.021	0.026	0.029	0.037	0.043	0.051
					RPM	50930	50399	49736	47746	33423	21751	16711	15597	12998	9947	7799	6631
					FEED	102	202	199	573	668	653	702	811	754	736	671	676
	11.1	High alloyed steel, and tool steel	1.0D	0.05D	Vc	80	95	125	150	210	205	210	245	245	250	245	250
					fz	0.001	0.002	0.002	0.006	0.01	0.015	0.021	0.026	0.029	0.037	0.043	0.051
					RPM	50930	50399	49736	47746	33423	21751	16711	15597	12998	9947	7799	6631
					FEED	102	202	199	573	668	653	702	811	754	736	671	676
	11.2		1.0D	0.05D	Vc	70	85	100	120	165	165	165	195	195	195	195	200
					fz	0.001	0.002	0.002	0.006	0.01	0.016	0.021	0.026	0.03	0.037	0.044	0.051
					RPM	44563	45094	39789	38197	26261	17507	13130	12414	10345	7759	6207	5305
					FEED	89	180	159	458	525	560	551	646	621	574	546	541
H	38.1	Hardened steel	1.0D	0.05D	Vc	70	85	100	120	165	165	165	195	195	195	195	200
					fz	0.001	0.002	0.002	0.006	0.01	0.016	0.021	0.026	0.03	0.037	0.044	0.051
					RPM	44563	45094	39789	38197	26261	17507	13130	12414	10345	7759	6207	5305
					FEED	89	180	159	458	525	560	551	646	621	574	546	541
	38.2		1.0D	0.05D	Vc	65	75	75	80	110	110	110	130	130	130	130	130
					fz	0.001	0.001	0.002	0.006	0.01	0.015	0.02	0.024	0.028	0.034	0.04	0.047
					RPM	41380	39789	29842	25465	17507	11671	8754	8276	6897	5173	4138	3448
					FEED	83	80	119	306	350	350	350	397	386	352	331	324
	39.1		1.0D	0.05D	Vc	50	55	65	65	90	90	90	100	100	100	100	100
					fz	0.001	0.001	0.001	0.004	0.007	0.011	0.015	0.018	0.021	0.026	0.03	0.036
					RPM	31831	29178	25863	20690	14324	9549	7162	6366	5305	3979	3183	2653
					FEED	64	58	52	166	201	210	215	229	223	207	191	191
	39.2		1.0D	0.05D	Vc	40	45	50	50	70	70	70	80	80	80	80	80
					fz	0.001	0.001	0.001	0.003	0.006	0.009	0.012	0.014	0.017	0.02	0.024	0.029
					RPM	25465	23873	19894	15915	11141	7427	5570	5093	4244	3183	2546	2122
					FEED	51	48	40	95	134	134	134	143	144	127	122	123
	39.3		1.0D	0.02D	Vc	30	40	40	40	60	60	60	70	70	70	70	70
					fz	0.001	0.001	0.001	0.003	0.005	0.007	0.01	0.012	0.014	0.017	0.021	0.024
					RPM	19099	21221	15915	12732	9549	6366	4775	4456	3714	2785	2228	1857
					FEED	19	25	29	71	90	89	96	105	100	95	91	90
	40	Chilled Cast Iron	1.0D	0.05D	Vc	70	85	100	120	165	165	165	195	195	195	195	200
					fz	0.001	0.002	0.002	0.006	0.01	0.016	0.021	0.026	0.03	0.037	0.044	0.051
					RPM	44563	45094	39789	38197	26261	17507	13130	12414	10345	7759	6207	5305
					FEED	89	180	159	458	525	560	551	646	621	574	546	541
	41	Hardened Cast Iron	1.0D	0.05D	Vc	65	75	75	80	110	110	110	130	130	130	130	130
					fz	0.001	0.001	0.002	0.006	0.01	0.015	0.02	0.024	0.028	0.034	0.04	0.047
					RPM	41380	39789	29842	25465	17507	11671	8754	8276	6897	5173	4138	3448
					FEED	83	80	119	306	350	350	350	397	386	352	331	324



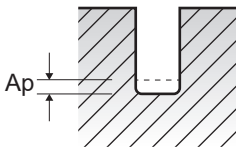
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A52 SERIES — 2 FLUTE CORNER RADIUS FOR RIB PROCESSING - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.5	0.6	0.8	1.0	1.2	1.5	2.0
P	5	Non-alloy steel	Vc	40~52	39~66	41~66	39~59	39~66	43~83	40~66
			fz	0.006~0.009	0.005~0.013	0.007~0.018	0.009~0.022	0.010~0.028	0.012~0.046	0.016~0.045
			RPM	25650~33000	20900~35200	16150~26400	12300~18700	10450~17600	9100~17600	6350~10550
			FEED	370~470	330~560	360~590	350~540	350~590	430~830	340~570
			Ap	0.0056~0.0350	0.0063~0.0294	0.0084~0.0392	0.0105~0.0280	0.0245~0.0700	0.0161~0.0770	0.0210~0.1400
	8-9	Low alloy steel	Vc	40~52	39~66	41~66	39~59	39~66	43~83	40~66
			fz	0.006~0.009	0.005~0.013	0.007~0.018	0.009~0.022	0.010~0.028	0.012~0.046	0.016~0.045
			RPM	25650~33000	20900~35200	16150~26400	12300~18700	10450~17600	9100~17600	6350~10550
			FEED	370~470	330~560	360~590	350~540	350~590	430~830	340~570
			Ap	0.0056~0.0350	0.0063~0.0294	0.0084~0.0392	0.0105~0.0280	0.0245~0.0700	0.0161~0.0770	0.0210~0.1400
	11.1 - 11.2	High alloyed steel, and tool steel	Vc	40~52	39~66	41~66	39~59	39~66	43~83	40~66
			fz	0.006~0.009	0.005~0.013	0.007~0.018	0.009~0.022	0.010~0.028	0.012~0.046	0.016~0.045
			RPM	25650~33000	20900~35200	16150~26400	12300~18700	10450~17600	9100~17600	6350~10550
			FEED	370~470	330~560	360~590	350~540	350~590	430~830	340~570
			Ap	0.0056~0.0350	0.0063~0.0294	0.0084~0.0392	0.0105~0.0280	0.0245~0.0700	0.0161~0.0770	0.0210~0.1400
H	38.1 - 38.2	Hardened steel	Vc	37~41	38~41	38~42	33~36	34~38	33~38	38~42
			fz	0.005~0.007	0.004~0.007	0.006~0.010	0.008~0.013	0.009~0.015	0.011~0.020	0.015~0.025
			RPM	23750~26000	19900~22000	15200~16700	10500~11500	9100~10000	7000~8000	6100~6700
			FEED	285~315	190~290	210~310	190~280	180~280	180~280	200~300
			Ap	0.0040~0.0250	0.0450~0.0210	0.0060~0.0280	0.0075~0.0200	0.0150~0.0420	0.0115~0.0550	0.0150~0.1000
	39.1 - 39.3		Vc	22~28	22~29	23~29	20~25	20~26	20~26	23~30
			fz	0.016~0.014	0.017~0.015	0.024~0.021	0.032~0.029	0.037~0.033	0.047~0.042	0.056~0.051
			RPM	14200~18000	11900~15500	9000~11700	6300~8050	5400~7000	4300~5500	3600~4700
			FEED	115~130	100~120	110~125	100~115	100~115	100~115	100~120
			Ap	0.016~0.014	0.017~0.015	0.024~0.021	0.032~0.029	0.037~0.033	0.047~0.042	0.056~0.051
	40	Chilled Cast Iron	Vc	40~52	39~66	41~66	39~59	39~66	43~83	40~66
			fz	0.006~0.009	0.005~0.013	0.007~0.018	0.009~0.022	0.010~0.028	0.012~0.046	0.016~0.045
			RPM	25650~33000	20900~35200	16150~26400	12300~18700	10450~17600	9100~17600	6350~10550
			FEED	370~470	330~560	360~590	350~540	350~590	430~830	340~570
			Ap	0.0056~0.0350	0.0063~0.0294	0.0084~0.0392	0.0105~0.0280	0.0245~0.0700	0.0161~0.0770	0.0210~0.1400
	41	Hardened Cast Iron	Vc	37~41	38~41	38~42	33~36	34~38	33~38	38~42
			fz	0.005~0.007	0.004~0.007	0.006~0.010	0.008~0.013	0.009~0.015	0.011~0.020	0.015~0.025
			RPM	23750~26000	19900~22000	15200~16700	10500~11500	9100~10000	7000~8000	6100~6700
			FEED	285~315	190~290	210~310	190~280	180~280	180~280	200~300
			Ap	0.0040~0.0250	0.0450~0.0210	0.0060~0.0280	0.0075~0.0200	0.0150~0.0420	0.0115~0.0550	0.0150~0.1000



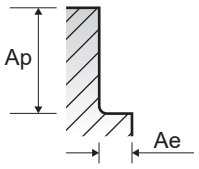
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A47, G8B08 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	5	Non-alloy steel	0.03D	1.0D	Vc	150	210	205	210	245	245	250	245	250	245	245
					fz	0.006	0.011	0.016	0.022	0.025	0.03	0.038	0.045	0.053	0.061	0.067
					RPM	47746	33423	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	1146	1471	1392	1471	1560	1560	1512	1404	1406	1189	1045
	8-9	Low alloy steel	0.03D	1.0D	Vc	150	210	205	210	245	245	250	245	250	245	245
					fz	0.006	0.011	0.016	0.022	0.025	0.03	0.038	0.045	0.053	0.061	0.067
					RPM	47746	33423	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	1146	1471	1392	1471	1560	1560	1512	1404	1406	1189	1045
	11.1	High alloyed steel, and tool steel	0.03D	1.0D	Vc	150	210	205	210	245	245	250	245	250	245	245
					fz	0.006	0.011	0.016	0.022	0.025	0.03	0.038	0.045	0.053	0.061	0.067
					RPM	47746	33423	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	1146	1471	1392	1471	1560	1560	1512	1404	1406	1189	1045
	11.2		0.03D	1.0D	Vc	120	165	165	165	195	195	195	195	200	195	195
					fz	0.006	0.01	0.014	0.02	0.024	0.027	0.035	0.041	0.048	0.056	0.063
					RPM	38197	26261	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	917	1050	980	1050	1192	1117	1086	1018	1019	869	782
H	38.1	Hardened steel	0.03D	1.0D	Vc	120	165	165	165	195	195	195	195	200	195	195
					fz	0.006	0.01	0.014	0.02	0.024	0.027	0.035	0.041	0.048	0.056	0.063
					RPM	38197	26261	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	917	1050	980	1050	1192	1117	1086	1018	1019	869	782
	38.2		0.03D	1.0D	Vc	80	110	110	110	130	130	130	130	130	130	130
					fz	0.006	0.01	0.015	0.02	0.024	0.028	0.035	0.041	0.048	0.056	0.063
					RPM	25465	17507	11671	8754	8276	6897	5173	4138	3448	2586	2069
					FEED	611	700	700	700	794	772	724	679	662	579	521
	39.1		0.03D	1.0D	Vc	65	90	90	90	100	100	100	100	100	100	100
					fz	0.004	0.007	0.011	0.015	0.018	0.021	0.026	0.03	0.036	0.042	0.048
					RPM	20690	14324	9549	7162	6366	5305	3979	3183	2653	1989	1592
					FEED	331	401	420	430	458	446	414	382	382	334	306
	39.2		0.03D	1.0D	Vc	50	70	70	70	80	80	80	80	80	80	80
					fz	0.003	0.006	0.009	0.012	0.015	0.017	0.021	0.024	0.029	0.034	0.038
					RPM	15915	11141	7427	5570	5093	4244	3183	2546	2122	1592	1273
					FEED	191	267	267	267	306	289	267	244	246	217	193
	39.3		0.03D	1.0D	Vc	40	60	60	60	70	70	70	70	70	70	70
					fz	0.003	0.005	0.007	0.01	0.012	0.014	0.017	0.02	0.024	0.029	0.033
					RPM	12732	9549	6366	4775	4456	3714	2785	2228	1857	1393	1114
					FEED	153	191	178	191	214	208	189	178	178	162	147
	40	Chilled Cast Iron	0.03D	1.0D	Vc	120	165	165	165	195	195	195	195	200	195	195
					fz	0.006	0.01	0.014	0.02	0.024	0.027	0.035	0.041	0.048	0.056	0.063
					RPM	38197	26261	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	917	1050	980	1050	1192	1117	1086	1018	1019	869	782
	41	Hardened Cast Iron	0.03D	1.0D	Vc	80	110	110	110	130	130	130	130	130	130	130
					fz	0.006	0.01	0.015	0.02	0.024	0.028	0.035	0.041	0.048	0.056	0.063
					RPM	25465	17507	11671	8754	8276	6897	5173	4138	3448	2586	2069
					FEED	611	700	700	700	794	772	724	679	662	579	521



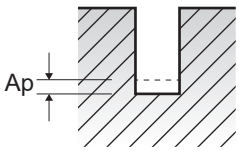
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A45 SERIES — 2 FLUTE for RIB PROCESSING - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 1.0	1.2	1.5	2.0	3.0	4.0
P	5	Non-alloy steel	Vc	39~59	39~66	43~83	40~66	41~66	40~67
			fz	0.014~0.014	0.017~0.017	0.024~0.024	0.027~0.027	0.064~0.064	0.063~0.064
			RPM	12300~18700	10450~17600	9100~17600	6350~10550	4300~7050	3200~5300
			FEED	350~540	350~590	430~830	340~570	550~900	400~675
			Ap	0.011~0.028	0.025~0.070	0.017~0.077	0.021~0.140	0.056~0.210	0.074~0.280
	8-9	Low alloy steel	Vc	39~59	39~66	43~83	40~66	41~66	40~67
			fz	0.014~0.014	0.017~0.017	0.024~0.024	0.027~0.027	0.064~0.064	0.063~0.064
			RPM	12300~18700	10450~17600	9100~17600	6350~10550	4300~7050	3200~5300
			FEED	350~540	350~590	430~830	340~570	550~900	400~675
			Ap	0.011~0.028	0.025~0.070	0.017~0.077	0.021~0.140	0.056~0.210	0.074~0.280
	11.1 - 11.2	High alloyed steel, and tool steel	Vc	39~59	39~66	43~83	40~66	41~66	40~67
			fz	0.014~0.014	0.017~0.017	0.024~0.024	0.027~0.027	0.064~0.064	0.063~0.064
			RPM	12300~18700	10450~17600	9100~17600	6350~10550	4300~7050	3200~5300
			FEED	350~540	350~590	430~830	340~570	550~900	400~675
			Ap	0.011~0.028	0.025~0.070	0.017~0.077	0.021~0.140	0.056~0.210	0.074~0.280
H	38.1 - 38.2	Hardened steel	Vc	33~36	34~38	33~38	38~42	38~43	38~43
			fz	0.012~0.012	0.014~0.014	0.018~0.018	0.022~0.022	0.056~0.056	0.056~0.056
			RPM	10500~11500	9100~10000	7000~8000	6100~6700	3990~4600	3000~3400
			FEED	250~280	250~280	250~280	270~300	445~515	335~380
			Ap	0.008~0.020	0.015~0.042	0.012~0.055	0.015~0100	0.040~0.150	0.053~0.200
	39.1 - 39.2		Vc	20~25	20~26	20~26	23~30	23~30	23~30
			fz	0.008~0.007	0.009~0.008	0.012~0.01	0.014~0.013	0.022~0.048	0.021~0.048
			RPM	6300~8050	5400~7000	4300~5500	3600~4700	2400~3200	1800~2400
			FEED	100~115	100~115	100~115	100~120	105~310	75~230
			Ap	0.005~0.012	0.009~0.026	0.007~0.033	0.009~0.060	0.024~0.090	0.032~0.120
	40	Chilled Cast Iron	Vc	39~59	39~66	43~83	40~66	41~66	40~67
			fz	0.014~0.014	0.017~0.017	0.024~0.024	0.027~0.027	0.064~0.064	0.063~0.064
			RPM	12300~18700	10450~17600	9100~17600	6350~10550	4300~7050	3200~5300
			FEED	350~540	350~590	430~830	340~570	550~900	400~675
			Ap	0.011~0.028	0.025~0.070	0.017~0.077	0.021~0.140	0.056~0.210	0.074~0.280
	41	Hardened Cast Iron	Vc	33~36	34~38	33~38	38~42	38~43	38~43
			fz	0.012~0.012	0.014~0.014	0.018~0.018	0.022~0.022	0.056~0.056	0.056~0.056
			RPM	10500~11500	9100~10000	7000~8000	6100~6700	3990~4600	3000~3400
			FEED	250~280	250~280	250~280	270~300	445~515	335~380
			Ap	0.008~0.020	0.015~0.042	0.012~0.055	0.015~0100	0.040~0.150	0.053~0.200



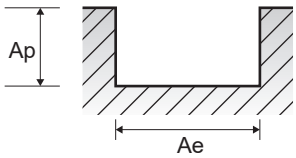
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A01, G8A36 SERIES — 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	5	Non-alloy steel	1.0D	0.05D	Vc	205	210	245	245	250	245	250	245	245
					fz	0.019	0.026	0.032	0.036	0.047	0.054	0.064	0.074	0.085
					RPM	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	827	869	998	936	935	842	849	721	663
	8-9	Low alloy steel	1.0D	0.05D	Vc	205	210	245	245	250	245	250	245	245
					fz	0.019	0.026	0.032	0.036	0.047	0.054	0.064	0.074	0.085
					RPM	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	827	869	998	936	935	842	849	721	663
	11.1	High alloyed steel, and tool steel	1.0D	0.05D	Vc	205	210	245	245	250	245	250	245	245
					fz	0.019	0.026	0.032	0.036	0.047	0.054	0.064	0.074	0.085
					RPM	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	827	869	998	936	935	842	849	721	663
	11.2		1.0D	0.05D	Vc	165	165	195	195	195	195	200	195	195
					fz	0.02	0.027	0.032	0.037	0.046	0.055	0.065	0.074	0.085
					RPM	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	700	709	794	766	714	683	690	574	528
H	38.1	Hardened steel	1.0D	0.05D	Vc	165	165	195	195	195	195	200	195	195
					fz	0.02	0.027	0.032	0.037	0.046	0.055	0.065	0.074	0.085
					RPM	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	700	709	794	766	714	683	690	574	528
	38.2		1.0D	0.05D	Vc	110	110	130	130	130	130	130	130	130
					fz	0.018	0.025	0.03	0.035	0.043	0.051	0.059	0.07	0.082
					RPM	11671	8754	8276	6897	5173	4138	3448	2586	2069
					FEED	420	438	497	483	445	422	407	362	339
	39.1		1.0D	0.05D	Vc	90	90	100	100	100	100	100	100	100
					fz	0.014	0.019	0.022	0.026	0.032	0.038	0.045	0.053	0.061
					RPM	9549	7162	6366	5305	3979	3183	2653	1989	1592
					FEED	267	272	280	276	255	242	239	211	194
	39.2		1.0D	0.05D	Vc	70	70	80	80	80	80	80	80	80
					fz	0.011	0.015	0.018	0.021	0.026	0.03	0.037	0.042	0.048
					RPM	7427	5570	5093	4244	3183	2546	2122	1592	1273
					FEED	163	167	183	178	166	153	157	134	122
	39.3		1.0D	0.02D	Vc	60	60	70	70	70	70	70	70	70
					fz	0.009	0.012	0.015	0.018	0.021	0.026	0.03	0.034	0.039
					RPM	6366	4775	4456	3714	2785	2228	1857	1393	1114
					FEED	115	118	132	131	119	114	112	94	86
	40	Chilled Cast Iron	1.0D	0.05D	Vc	165	165	195	195	195	195	200	195	195
					fz	0.02	0.027	0.032	0.037	0.046	0.055	0.065	0.074	0.085
					RPM	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	700	709	794	766	714	683	690	574	528
	41	Hardened Cast Iron	1.0D	0.05D	Vc	110	110	130	130	130	130	130	130	130
					fz	0.018	0.025	0.03	0.035	0.043	0.051	0.059	0.07	0.082
					RPM	11671	8754	8276	6897	5173	4138	3448	2586	2069
					FEED	420	438	497	483	445	422	407	362	339



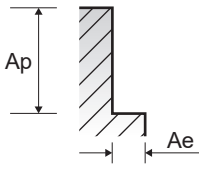
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8A02, G8A37 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	5	Non-alloy steel	0.03D	1.0D	Vc	150	210	205	210	245	245	250	245	250	245	245
					fz	0.008	0.013	0.02	0.027	0.032	0.037	0.048	0.056	0.066	0.077	0.083
					RPM	47746	33423	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	1528	1738	1740	1805	1996	1924	1910	1747	1751	1501	1294
	8-9	Low alloy steel	0.03D	1.0D	Vc	150	210	205	210	245	245	250	245	250	245	245
					fz	0.008	0.013	0.02	0.027	0.032	0.037	0.048	0.056	0.066	0.077	0.083
					RPM	47746	33423	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	1528	1738	1740	1805	1996	1924	1910	1747	1751	1501	1294
	11.1	High alloyed steel, and tool steel	0.03D	1.0D	Vc	150	210	205	210	245	245	250	245	250	245	245
					fz	0.008	0.013	0.02	0.027	0.032	0.037	0.048	0.056	0.066	0.077	0.083
					RPM	47746	33423	21751	16711	15597	12998	9947	7799	6631	4874	3899
					FEED	1528	1738	1740	1805	1996	1924	1910	1747	1751	1501	1294
	11.2		0.03D	1.0D	Vc	120	165	165	165	195	195	195	195	200	195	195
					fz	0.007	0.012	0.018	0.025	0.03	0.034	0.043	0.051	0.06	0.071	0.078
					RPM	38197	26261	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	1070	1261	1261	1313	1490	1407	1335	1266	1273	1102	968
H	38.1	Hardened steel	0.03D	1.0D	Vc	120	165	165	165	195	195	195	195	200	195	195
					fz	0.007	0.012	0.018	0.025	0.03	0.034	0.043	0.051	0.06	0.071	0.078
					RPM	38197	26261	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	1070	1261	1261	1313	1490	1407	1335	1266	1273	1102	968
	38.2		0.03D	1.0D	Vc	80	110	110	110	130	130	130	130	130	130	130
					fz	0.007	0.012	0.018	0.025	0.03	0.034	0.043	0.051	0.06	0.07	0.079
					RPM	25465	17507	11671	8754	8276	6897	5173	4138	3448	2586	2069
					FEED	713	840	840	875	993	938	890	844	828	724	654
	39.1		0.03D	1.0D	Vc	65	90	90	90	100	100	100	100	100	100	100
					fz	0.005	0.009	0.014	0.019	0.023	0.026	0.033	0.038	0.045	0.053	0.059
					RPM	20690	14324	9549	7162	6366	5305	3979	3183	2653	1989	1592
					FEED	414	516	535	544	586	552	525	484	478	422	376
	39.2		0.03D	1.0D	Vc	50	70	70	70	80	80	80	80	80	80	80
					fz	0.004	0.007	0.011	0.015	0.018	0.021	0.026	0.03	0.036	0.042	0.048
					RPM	15915	11141	7427	5570	5093	4244	3183	2546	2122	1592	1273
					FEED	255	312	327	334	367	356	331	306	306	267	244
	39.3		0.03D	1.0D	Vc	40	60	60	60	70	70	70	70	70	70	70
					fz	0.004	0.007	0.009	0.013	0.016	0.018	0.022	0.025	0.03	0.036	0.041
					RPM	12732	9549	6366	4775	4456	3714	2785	2228	1857	1393	1114
					FEED	204	267	229	248	285	267	245	223	223	201	183
	40	Chilled Cast Iron	0.03D	1.0D	Vc	120	165	165	165	195	195	195	195	200	195	195
					fz	0.007	0.012	0.018	0.025	0.03	0.034	0.043	0.051	0.06	0.071	0.078
					RPM	38197	26261	17507	13130	12414	10345	7759	6207	5305	3879	3104
					FEED	1070	1261	1261	1313	1490	1407	1335	1266	1273	1102	968
	41	Hardened Cast Iron	0.03D	1.0D	Vc	80	110	110	110	130	130	130	130	130	130	130
					fz	0.007	0.012	0.018	0.025	0.03	0.034	0.043	0.051	0.06	0.07	0.079
					RPM	25465	17507	11671	8754	8276	6897	5173	4138	3448	2586	2069
					FEED	713	840	840	875	993	938	890	844	828	724	654



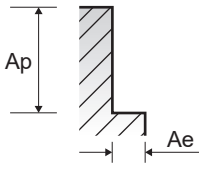
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G8D63 SERIES 6&8 FLUTE LONG LENGTH - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	5	Non-alloy steel	0.04D	1.5D	Vc	120	120	120	120	120	120	120	120	125
					fz	0.039	0.052	0.063	0.07	0.081	0.09	0.095	0.08	0.11
					RPM	6366	4775	3820	3183	2728	2387	2122	1910	1592
					FEED	1490	1490	1444	1337	1326	1289	1613	1222	1401
	8-9	Low alloy steel	0.04D	1.5D	Vc	120	120	120	120	120	120	120	120	125
					fz	0.039	0.052	0.063	0.07	0.081	0.09	0.095	0.08	0.11
					RPM	6366	4775	3820	3183	2728	2387	2122	1910	1592
					FEED	1490	1490	1444	1337	1326	1289	1613	1222	1401
	11.1	High alloyed steel, and tool steel	0.04D	1.5D	Vc	120	120	120	120	120	120	120	120	125
					fz	0.039	0.052	0.063	0.07	0.081	0.09	0.095	0.08	0.11
					RPM	6366	4775	3820	3183	2728	2387	2122	1910	1592
					FEED	1490	1490	1444	1337	1326	1289	1613	1222	1401
	11.2		0.04D	1.5D	Vc	95	95	95	95	95	95	95	100	95
					fz	0.035	0.046	0.055	0.062	0.07	0.079	0.08	0.091	0.096
					RPM	5040	3780	3024	2520	2160	1890	1680	1592	1210
					FEED	1058	1043	998	937	907	896	1075	1159	929
H	38.1 - 38.2	Hardened steel	0.04D	1.5D	Vc	95	95	95	95	95	95	95	100	95
					fz	0.035	0.046	0.055	0.062	0.07	0.079	0.08	0.091	0.096
					RPM	5040	3780	3024	2520	2160	1890	1680	1592	1210
					FEED	1058	1043	998	937	907	896	1075	1159	929
	39.1 - 39.2		0.04D	1.5D	Vc	70	70	70	70	70	70	70	75	75
					fz	0.031	0.042	0.05	0.056	0.066	0.072	0.073	0.069	0.087
					RPM	3714	2785	2228	1857	1592	1393	1238	1194	955
					FEED	691	702	668	624	630	602	723	659	665
	39.3		0.04D	1.5D	Vc	50	50	50	50	45	50	50	45	50
					fz	0.028	0.037	0.045	0.05	0.051	0.064	0.066	0.071	0.079
					RPM	2653	1989	1592	1326	1023	995	884	716	637
					FEED	446	442	430	398	313	382	467	407	403
	40	Chilled Cast Iron	0.04D	1.5D	Vc	95	95	95	95	95	95	95	100	95
					fz	0.035	0.046	0.055	0.062	0.07	0.079	0.08	0.091	0.096
					RPM	5040	3780	3024	2520	2160	1890	1680	1592	1210
					FEED	1058	1043	998	937	907	896	1075	1159	929
	41	Hardened Cast Iron	0.04D	1.5D	Vc	95	95	95	95	95	95	95	100	95
					fz	0.035	0.046	0.055	0.062	0.07	0.079	0.08	0.091	0.096
					RPM	5040	3780	3024	2520	2160	1890	1680	1592	1210
					FEED	1058	1043	998	937	907	896	1075	1159	929



Global Cutting Tool Leader **YG-1**

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SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
4G Mill
END MILLS

High Speed Cutting
for Pre-Hardened Steels up to HRc55

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◎ : Excellent ○ : Good

Recommended cutting conditions : p. C300

SERIES	SEMD98	SEM846	SEM846	SEMD99
FLUTE	2	2	2	2
HELIX ANGLE	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS
SIZE MIN	R0.05	R0.05	R0.25	D0.2
SIZE MAX	R12.5	R6.0	R1.0	D20.0
PAGE	C204	C210	C219	C222
	-	EXTENDED NECK	EXTENDED NECK (6mm SHANK)	-
	Y-Coating	Y-Coating	Y-Coating	Y-Coating

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	○	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○
	11			Quenched & Tempered	325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○	○
	18		Pearlitic		250	25	○	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○	○
	20		Pearlitic		230	21	○	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55	○	○	○	○
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	○	○	○	○

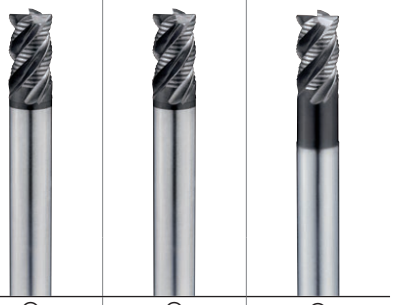
SELECTION GUIDE

YG MILLING TOOLS

SERIES	G9D75 G9D67	G9D76 G9D68	G9D77 G9D69
FLUTE	4&5	4&5	4&5
HELIX ANGLE	44°~45° (MULTIPLE HELIX)	44°~45° (MULTIPLE HELIX)	44°~45° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING
SIZE MIN	D6.0	D6.0	D6.0
SIZE MAX	D20.0	D20.0	D20.0
PAGE	C297	C298	C299
	SHORT LENGTH	LONG LENGTH	LONG REACH
	X-Coating	X-Coating	X-Coating

SOLID CARBIDE
4G Mill
X-SPEED ROUGHER END MILLS

High Speed Cutting
for Pre-Hardened Steels up to HRc55



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C368

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○
	11			Quenched & Tempered	325	35	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○	○
	14		Austenitic		180	10	○	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	◎	◎
	20		Pearlitic		230	21	◎	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

4G MILL END MILLS

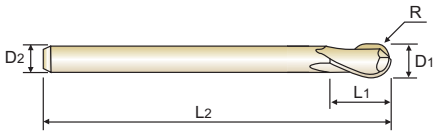
PLAIN SHANK **SEMD98** SERIES

CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS
Fraise carbure, 2 dents, hémisphérique
MD, 2 TAGLIENTI, SEMISFERICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit.
- Aufgrund der einzigartigen Kugelgeometrie und Schneidkantenpräparation wird die Schnittkraft reduziert und die Verschleißfestigkeit erhöht.
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p.C300~C301

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D_1	D_2	L_1	L_2	
SEMD98001SE	R0.05	0.1	4	0.1	40	Short
SEMD980013SE	R0.05	0.1	3	0.2	40	3mm Shank
SEMD980015SE	R0.075	0.15	4	0.15	40	Short
SEMD980015E	R0.075	0.15	4	0.3	40	Regular
SEMD9800153SE	R0.075	0.15	3	0.3	40	3mm Shank
SEMD98002SE	R0.1	0.2	4	0.2	40	Short
SEMD98002E	R0.1	0.2	4	0.4	40	Regular
SEMD980023SE	R0.1	0.2	3	0.4	40	3mm Shank
SEMD98003SE	R0.15	0.3	4	0.3	40	Short
SEMD98003E	R0.15	0.3	4	0.6	40	Regular
SEMD980033SE	R0.15	0.3	3	0.6	40	3mm Shank
SEMD98004SE	R0.2	0.4	4	0.4	40	Short
SEMD98004E	R0.2	0.4	4	0.8	40	Regular
SEMD980043SE	R0.2	0.4	3	0.8	40	3mm Shank
SEMD98005S6SE	R0.25	0.5	6	0.8	40	-
SEMD98005E	R0.25	0.5	4	1.0	40	Regular
SEMD98006SE	R0.3	0.6	4	0.6	40	Short
SEMD98006E	R0.3	0.6	4	1.2	40	Regular
SEMD980063SE	R0.3	0.6	3	1.2	40	3mm Shank
SEMD98007E	R0.35	0.7	4	1.4	40	Regular
SEMD98008E	R0.4	0.8	4	1.6	40	Regular
SEMD980083SE	R0.4	0.8	3	1.6	40	3mm Shank
SEMD98009SE	R0.45	0.9	4	0.9	40	Short
SEMD98009E	R0.45	0.9	4	1.8	40	Regular

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS
Fraise carbure, 2 dents, hémisphérique
MD, 2 TAGLIENTI, SEMISFERICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
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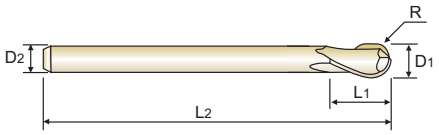
- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit.
- Aufgrund der einzigartigen Kugelgeometrie und Schneidkantenpräparation wird die Schnittkraft reduziert und die Verschleißfestigkeit erhöht.
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p.C300~C301

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D_1	D_2	L_1	L_2	
SEMD980253SE	R1.25	2.5	3	6	60	3mm Shank
SEMD980254SE	R1.25	2.5	4	6	60	Regular
SEMD98025E	R1.25	2.5	6	6	60	Regular
SEMD98025080E	R1.25	2.5	6	6	80	Long Shank
SEMD98025100E	R1.25	2.5	6	6	100	Long Shank
SEMD98030040E	R1.5	3.0	6	4.5	40	Short
SEMD980303SE	R1.5	3.0	3	6	60	3mm Shank
SEMD980304SE	R1.5	3.0	4	6	60	Regular
SEMD98030E	R1.5	3.0	6	6	60	Regular
SEMD98030080E	R1.5	3.0	6	6	80	Long Shank
SEMD98030100E	R1.5	3.0	6	6	100	Long Shank
SEMD98035E	R1.75	3.5	6	8	70	-
SEMD98040050E	R2.0	4.0	6	6	50	Short
SEMD980404SE	R2.0	4.0	4	8	70	Regular
SEMD98040E	R2.0	4.0	6	8	70	Regular
SEMD980401004SE	R2.0	4.0	4	8	100	Long Shank
SEMD980401204SE	R2.0	4.0	4	8	120	Long Shank
SEMD98040100E	R2.0	4.0	6	8	100	Long Shank
SEMD98040120E	R2.0	4.0	6	8	120	Long Shank
SEMD98045E	R2.25	4.5	6	9	80	-
SEMD98050060E	R2.5	5.0	6	7.5	60	Short
SEMD98050E	R2.5	5.0	6	10	80	Regular
SEMD980505SE	R2.5	5.0	5	10	80	5mmShank
SEMD98055E	R2.75	5.5	6	11	90	-

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

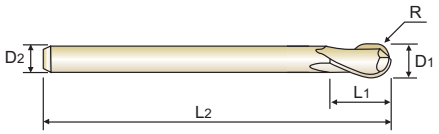
PLAIN SHANK **SEMD98** SERIES

CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS
Fraise carbure, 2 dents, hémisphérique
MD, 2 TAGLIENTI, SEMISFERICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit.
- Aufgrund der einzigartigen Kugelgeometrie und Schneidkantenpräparation wird die Schnittkraft reduziert und die Verschleißfestigkeit erhöht.
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p.C300~C301

R0.05~R3 R3.25~R12.5

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD98100150E	R5.0	10.0	10	18	150	Long Shank
SEMD98100180E	R5.0	10.0	10	18	180	Long Shank
SEMD98100200E	R5.0	10.0	10	18	200	Long Shank
SEMD98110E	R5.5	11.0	12	20	100	-
SEMD98120060E	R6.0	12.0	12	18	60	Short
SEMD98120080E	R6.0	12.0	12	18	80	Short
SEMD98120090E	R6.0	12.0	12	18	90	Short
SEMD98120100E	R6.0	12.0	12	18	100	Short
SEMD98120E	R6.0	12.0	12	22	110	Regular
SEMD98120130E	R6.0	12.0	12	22	130	Long Shank
SEMD98120150E	R6.0	12.0	12	22	150	Long Shank
SEMD98120200E	R6.0	12.0	12	22	200	Long Shank
SEMD98130E	R6.5	13.0	12	24	100	-
SEMD98140E	R7.0	14.0	12	26	100	Regular
SEMD9814016SE	R7.0	14.0	16	26	100	-
SEMD98150E	R7.5	15.0	16	28	140	-
SEMD98160100E	R8.0	16.0	16	24	100	Short
SEMD98160130E	R8.0	16.0	16	24	130	Short
SEMD98160E	R8.0	16.0	16	30	150	Regular
SEMD98160200E	R8.0	16.0	16	30	200	Long Shank
SEMD9818018SE	R9.0	18.0	18	34	150	-
SEMD98200100E	R10.0	20.0	20	30	100	Short
SEMD98200130E	R10.0	20.0	20	30	130	Short
SEMD98200E	R10.0	20.0	20	38	150	Regular

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

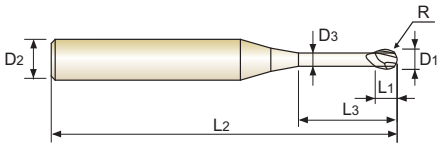
PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS mit LANG ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, hémisphérique, détalonnée
MD, 2 TAGLIENTI, SEMISFERICA, SCARICATA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit.
- Aufgrund der einzigartigen Kugelgeometrie und Schneidkantenpräparation wird die Schnittkraft reduziert und die Verschleißfestigkeit erhöht.
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.



CARBIDE | 2 | 30° | R ±0.005 (R0.05~R3) | R ±0.010 (R4~R6) | PLAIN | Y Coating

p.C302~C313

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D_1	D_2	L_1	L_3	L_2	D_3
SEM846001002E	R0.05	**0.1**	4	0.1	0.2	40	0.085
SEM846001005E	R0.05	**0.1**	4	0.1	0.5	40	0.085
SEM84600101E	R0.05	**0.1**	4	0.1	1	40	0.085
SEM846002005E	R0.1	**0.2**	4	0.2	0.5	40	0.17
SEM84600201E	R0.1	**0.2**	4	0.2	1	40	0.17
SEM846002015E	R0.1	**0.2**	4	0.2	1.5	40	0.17
SEM84600203E	R0.1	**0.2**	4	0.2	3	40	0.17
SEM84600301E	R0.15	**0.3**	4	0.3	1	40	0.27
SEM846003015E	R0.15	**0.3**	4	0.3	1.5	40	0.27
SEM84600302E	R0.15	**0.3**	4	0.3	2	40	0.27
SEM846003025E	R0.15	**0.3**	4	0.3	2.5	40	0.27
SEM84600303E	R0.15	**0.3**	4	0.3	3	40	0.27
SEM84600304E	R0.15	**0.3**	4	0.3	4	40	0.27
SEM84600305E	R0.15	**0.3**	4	0.3	5	40	0.27
SEM84600401E	R0.2	**0.4**	4	0.4	1	40	0.37
SEM846004015E	R0.2	**0.4**	4	0.4	1.5	40	0.37
SEM84600402E	R0.2	**0.4**	4	0.4	2	40	0.37
SEM846004025E	R0.2	**0.4**	4	0.4	2.5	40	0.37
SEM84600403E	R0.2	**0.4**	4	0.4	3	40	0.37
SEM84600404E	R0.2	**0.4**	4	0.4	4	40	0.37
SEM84600405E	R0.2	**0.4**	4	0.4	5	40	0.37
SEM84600406E	R0.2	**0.4**	4	0.4	6	40	0.37
SEM846005015E	R0.25	**0.5**	4	0.5	1.5	45	0.45
SEM84600502E	R0.25	**0.5**	4	0.5	2	45	0.45

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

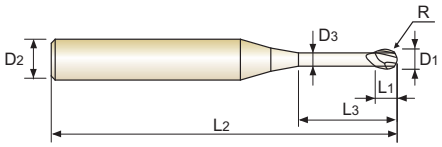
PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS mit LANG ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, hémisphérique, détalonnée
MD, 2 TAGLIENTI, SEMISFERICA, SCARICATA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit.
- Aufgrund der einzigartigen Kugelgeometrie und Schneidkantenpräparation wird die Schnittkraft reduziert und die Verschleißfestigkeit erhöht.
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.



CARBIDE | 2 | 30° | R ±0.005 (R0.05~R3) | R ±0.010 (R4~R6) | PLAIN | Y Coating

p.C302~C313

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D_1	D_2	L_1	L_3	L_2	D_3
SEM84600802E	R0.4	**0.8**	4	0.8	2	45	0.75
SEM84600803E	R0.4	**0.8**	4	0.8	3	45	0.75
SEM84600804E	R0.4	**0.8**	4	0.8	4	45	0.75
SEM84600805E	R0.4	**0.8**	4	0.8	5	45	0.75
SEM84600806E	R0.4	**0.8**	4	0.8	6	45	0.75
SEM84600808E	R0.4	**0.8**	4	0.8	8	45	0.75
SEM84600810E	R0.4	**0.8**	4	0.8	10	45	0.75
SEM84600812E	R0.4	**0.8**	4	0.8	12	45	0.75
SEM84600814E	R0.4	**0.8**	4	0.8	14	45	0.75
SEM84600816E	R0.4	**0.8**	4	0.8	16	45	0.75
SEM84600820E	R0.4	**0.8**	4	0.8	20	45	0.75
SEM84600904E	R0.45	**0.9**	4	0.9	4	45	0.85
SEM84601002E	R0.5	**1.0**	4	1	2	50	0.95
SEM84601003E	R0.5	**1.0**	4	1	3	50	0.95
SEM84601004E	R0.5	**1.0**	4	1	4	50	0.95
SEM84601005E	R0.5	**1.0**	4	1	5	50	0.95
SEM84601006E	R0.5	**1.0**	4	1	6	50	0.95
SEM84601007E	R0.5	**1.0**	4	1	7	50	0.95
SEM84601008E	R0.5	**1.0**	4	1	8	50	0.95
SEM84601009E	R0.5	**1.0**	4	1	9	50	0.95
SEM84601010E	R0.5	**1.0**	4	1	10	50	0.95
SEM84601012E	R0.5	**1.0**	4	1	12	50	0.95
SEM84601014E	R0.5	**1.0**	4	1	14	50	0.95
SEM84601016E	R0.5	**1.0**	4	1	16	50	0.95

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

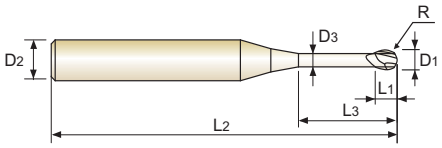
PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS mit LANG ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, hémisphérique, détalonnée
MD, 2 TAGLIENTI, SEMISFERICA, SCARICATA

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Due to unique ball nose geometry and cutting edges, cutting force decreased, and so wear resistance increased.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit.
- Aufgrund der einzigartigen Kugelgeometrie und Schneidkantenpräparation wird die Schnittkraft reduziert und die Verschleißfestigkeit erhöht.
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.



CARBIDE | 2 | 30° | R ±0.005 (R0.05~R3) | R ±0.010 (R4~R6) | PLAIN | Y Coating

p.C302~C313

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D_1	D_2	L_1	L_3	L_2	D_3
SEM84601510E	R0.75	1.5	4	1.5	10	50	1.45
SEM84601512E	R0.75	1.5	4	1.5	12	50	1.45
SEM84601514E	R0.75	1.5	4	1.5	14	50	1.45
SEM84601516E	R0.75	1.5	4	1.5	16	50	1.45
SEM84601518E	R0.75	1.5	4	1.5	18	50	1.45
SEM84601520E	R0.75	1.5	4	1.5	20	50	1.45
SEM84601522E	R0.75	1.5	4	1.5	22	60	1.45
SEM84601526E	R0.75	1.5	4	1.5	26	60	1.45
SEM84601530E	R0.75	1.5	4	1.5	30	70	1.45
SEM84601535E	R0.75	1.5	4	1.5	35	70	1.45
SEM84601540E	R0.75	1.5	4	1.5	40	80	1.45
SEM84601604E	R0.8	1.6	4	1.6	4	50	1.55
SEM84601606E	R0.8	1.6	4	1.6	6	50	1.55
SEM84601608E	R0.8	1.6	4	1.6	8	50	1.55
SEM84601612E	R0.8	1.6	4	1.6	12	50	1.55
SEM84601616E	R0.8	1.6	4	1.6	16	50	1.55
SEM84601804E	R0.9	1.8	4	1.8	4	50	1.75
SEM84601806E	R0.9	1.8	4	1.8	6	50	1.75
SEM84601808E	R0.9	1.8	4	1.8	8	50	1.75
SEM84601810E	R0.9	1.8	4	1.8	10	50	1.75
SEM84601812E	R0.9	1.8	4	1.8	12	50	1.75
SEM84601816E	R0.9	1.8	4	1.8	16	50	1.75
SEM84601820E	R0.9	1.8	4	1.8	20	50	1.75
SEM84602004E	R1.0	2.0	4	2	4	50	1.95

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Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS mit LANG ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, hémisphérique, détalonnée
MD, 2 TAGLIENTI, SEMISFERICA, SCARICATA

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- Aufgrund der einzigartigen Kugelgeometrie und Schneidkantenpräparation wird die Schnittkraft reduziert und die Verschleißfestigkeit erhöht.
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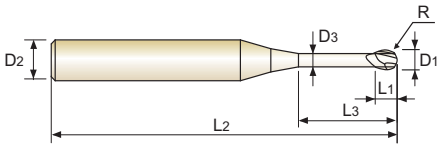

CARBIDE | 2 | 30° | R ±0.005 (R0.05~R3) | R ±0.010 (R4~R6) | PLAIN | Y Coating

p.C302~C313

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84602535E	R1.25	2.5	4	2.5	35	70	2.40
SEM84602545E	R1.25	2.5	4	2.5	45	90	2.40
SEM84603006E	R1.5	3.0	6	3	6	50	2.85
SEM84603008E	R1.5	3.0	6	3	8	50	2.85
SEM84603010E	R1.5	3.0	6	3	10	50	2.85
SEM84603012E	R1.5	3.0	6	3	12	50	2.85
SEM84603014E	R1.5	3.0	6	3	14	60	2.85
SEM84603015E	R1.5	3.0	6	3	15	60	2.85
SEM84603016E	R1.5	3.0	6	3	16	60	2.85
SEM84603018E	R1.5	3.0	6	3	18	60	2.85
SEM84603020E	R1.5	3.0	6	3	20	60	2.85
SEM84603022E	R1.5	3.0	6	3	22	65	2.85
SEM84603026E	R1.5	3.0	6	3	26	65	2.85
SEM84603030E	R1.5	3.0	6	3	30	70	2.85
SEM84603035E	R1.5	3.0	6	3	35	70	2.85
SEM84603040E	R1.5	3.0	6	3	40	80	2.85
SEM84603045E	R1.5	3.0	6	3	45	90	2.85
SEM84603050E	R1.5	3.0	6	3	50	100	2.85
SEM84603060E	R1.5	3.0	6	3	60	100	2.85
SEM84604008E	R2.0	4.0	6	4	8	50	3.85
SEM84604010E	R2.0	4.0	6	4	10	50	3.85
SEM84604012E	R2.0	4.0	6	4	12	50	3.85
SEM84604014E	R2.0	4.0	6	4	14	60	3.85
SEM84604016E	R2.0	4.0	6	4	16	60	3.85

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS mit LANG ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, hémisphérique, détalonnée
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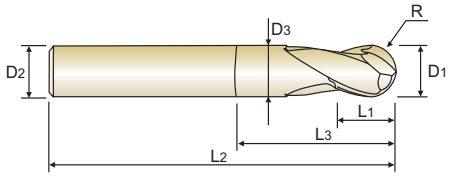
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p.C302~C313

R0.05~R3 R4~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84608035E	R4.0	**8.0**	8	10	35	70	7.70
SEM84608025100E	R4.0	**8.0**	8	14	25	100	7.70
SEM84608035100E	R4.0	**8.0**	8	14	35	100	7.70
SEM84610030E	R5.0	**10.0**	10	12	30	75	9.70
SEM84610040E	R5.0	**10.0**	10	12	40	75	9.70
SEM84610030100E	R5.0	**10.0**	10	18	30	100	9.70
SEM84610040100E	R5.0	**10.0**	10	18	40	100	9.70
SEM84612032E	R6.0	**12.0**	12	14	32	80	11.70
SEM84612045E	R6.0	**12.0**	12	14	45	80	11.70
SEM84612032110E	R6.0	**12.0**	12	22	32	110	11.70
SEM84612045110E	R6.0	**12.0**	12	22	45	110	11.70

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	± 0.005	0 ~ - 0.012	h5
over R3	± 0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

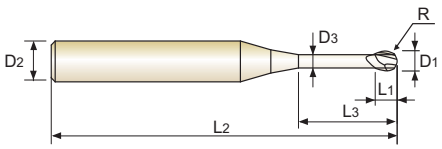
PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK (6mm shank)

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS mit ABGESETZTEM SCHAFTTETL (6mm ZYLINDERSCHAFT)
Fraise carbure, 2 dents, hémisphérique, détalonnée (Ø queue 6mm)
MD, 2 TAGLIENTI, SEMISFERICA, SCARICATA (gambo 6mm)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- With its unique ball nose geometry and cutting edges the cutting force has decreased, also increasing wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit.
- Aufgrund der einzigartigen Kugelgeometrie und Schneidkantenpräparation wird die Schnittkraft reduziert und die Verschleißfestigkeit erhöht.
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | Y Coating

p.C302~C313

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.005)	D1	D2	L1	L3	L2	D3
SEM846010076SE	R0.5	1.0	6	1	7	50	0.95
SEM846010086SE	R0.5	1.0	6	1	8	50	0.95
SEM846010106SE	R0.5	1.0	6	1	10	50	0.95
SEM846010126SE	R0.5	1.0	6	1	12	50	0.95
SEM846010166SE	R0.5	1.0	6	1	16	50	0.95
SEM846010186SE	R0.5	1.0	6	1	18	50	0.95
SEM846010206SE	R0.5	1.0	6	1	20	50	0.95
SEM846010226SE	R0.5	1.0	6	1	22	60	0.95
SEM846010266SE	R0.5	1.0	6	1	26	60	0.95
SEM846010306SE	R0.5	1.0	6	1	30	70	0.95
SEM846015036SE	R0.75	1.5	6	1.5	3	50	1.45
SEM846015046SE	R0.75	1.5	6	1.5	4	50	1.45
SEM846015066SE	R0.75	1.5	6	1.5	6	50	1.45
SEM846015126SE	R0.75	1.5	6	1.5	12	50	1.45
SEM846015146SE	R0.75	1.5	6	1.5	14	50	1.45
SEM846015166SE	R0.75	1.5	6	1.5	16	50	1.45
SEM846015186SE	R0.75	1.5	6	1.5	18	50	1.45
SEM846015206SE	R0.75	1.5	6	1.5	20	50	1.45
SEM846015226SE	R0.75	1.5	6	1.5	22	60	1.45
SEM846015266SE	R0.75	1.5	6	1.5	26	60	1.45
SEM846015306SE	R0.75	1.5	6	1.5	30	70	1.45
SEM846020066SE	R1.0	2.0	6	2	6	50	1.95
SEM846020086SE	R1.0	2.0	6	2	8	50	1.95
SEM846020106SE	R1.0	2.0	6	2	10	50	1.95

▶ NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.005	0 ~ - 0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

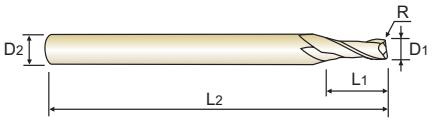
PLAIN SHANK **SEMD99** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS
Fraise carbure, 2 dents, torique
MD, 2 TAGLIENTI, TORICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available in short, regular and long shank end mills.
- Available with various corner radius end mills, from 0.02mm to 5.0mm corner radius.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: kurz, standard und lang
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 5,0mm Eckradius.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C314~C315

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD99002002E	R0.02	0.2	4	0.4	40	-
SEMD99002005E	R0.05	0.2	4	0.4	40	-
SEMD99003002E	R0.02	0.3	4	0.6	40	-
SEMD99004005E	R0.05	0.4	4	0.8	40	-
SEMD9900401E	R0.1	0.4	4	0.8	40	-
SEMD9900501E	R0.1	0.5	4	1	40	-
SEMD99006005E	R0.05	0.6	4	1.2	40	-
SEMD9900601E	R0.1	0.6	4	1.2	40	-
SEMD9900602E	R0.2	0.6	4	1.2	40	-
SEMD9900701E	R0.1	0.7	4	1.4	40	-
SEMD99008005E	R0.05	0.8	4	1.6	40	-
SEMD9900801E	R0.1	0.8	4	1.6	40	-
SEMD9900802E	R0.2	0.8	4	1.6	40	-
SEMD99009005E	R0.05	0.9	4	1.8	40	-
SEMD9900901E	R0.1	0.9	4	1.8	40	-
SEMD99010034SE	R0.3	1.0	4	2.5	50	4mm Shank
SEMD99010005E	R0.05	1.0	6	2.5	50	-
SEMD9901001E	R0.1	1.0	6	2.5	50	-
SEMD9901002E	R0.2	1.0	6	2.5	50	-
SEMD9901003E	R0.3	1.0	6	2.5	50	-
SEMD99012005E	R0.05	1.2	6	3	50	-
SEMD9901201E	R0.1	1.2	6	3	50	-
SEMD9901202E	R0.2	1.2	6	3	50	-
SEMD9901203E	R0.3	1.2	6	3	50	-

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

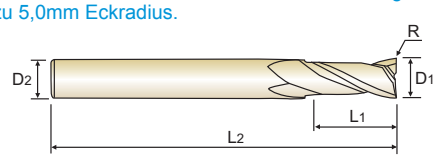
PLAIN SHANK **SEMD99 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS
Fraise carbure, 2 dents, torique
MD, 2 TAGLIENTI, TORICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available in short, regular and long shank end mills.
- Available with various corner radius end mills, from 0.02mm to 5.0mm corner radius.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: kurz, standard und lang
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 5,0mm Eckradius.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C314~C315

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD99040011004SE	R0.1	4.0	4	10	100	4mm Shank
SEMD99040031004SE	R0.3	4.0	4	10	100	4mm Shank
SEMD99040051004SE	R0.5	4.0	4	10	100	4mm Shank
SEMD99040101004SE	R1.0	4.0	4	10	100	4mm Shank
SEMD9904002E	R0.2	4.0	6	10	70	Regular
SEMD9904003E	R0.3	4.0	6	10	70	Regular
SEMD9904005E	R0.5	4.0	6	10	70	Regular
SEMD9904010E	R1.0	4.0	6	10	70	Regular
SEMD9904501E	R0.1	4.5	6	11	80	-
SEMD9904502E	R0.2	4.5	6	11	80	-
SEMD9904503E	R0.3	4.5	6	11	80	-
SEMD9904505E	R0.5	4.5	6	11	80	-
SEMD9905002E	R0.2	5.0	6	13	90	-
SEMD9905003E	R0.3	5.0	6	13	90	-
SEMD9905005E	R0.5	5.0	6	13	90	-
SEMD9905010E	R1.0	5.0	6	13	90	-
SEMD9905501E	R0.1	5.5	6	13	90	-
SEMD9905502E	R0.2	5.5	6	13	90	-
SEMD9905510E	R1.0	5.5	6	13	90	-
SEMD9906002060E	R0.2	6.0	6	15	60	Short
SEMD9906003060E	R0.3	6.0	6	15	60	Short
SEMD9906005060E	R0.5	6.0	6	15	60	Short
SEMD9906010060E	R1.0	6.0	6	15	60	Short
SEMD9906001E	R0.1	6.0	6	15	90	Regular

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

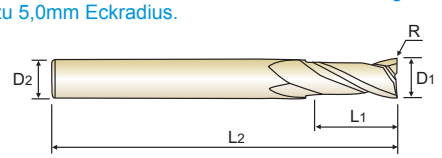
PLAIN SHANK **SEMD99** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS
Fraise carbure, 2 dents, torique
MD, 2 TAGLIENTI, TORICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available in short, regular and long shank end mills.
- Available with various corner radius end mills, from 0.02mm to 5.0mm corner radius.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: kurz, standard und lang
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 5,0mm Eckradius.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C314~C315

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD9908010120E	R1.0	**8.0**	8	20	120	Long Shank
SEMD9908015150E	R0.5	**8.0**	8	20	150	Long Shank
SEMD9908010150E	R1.0	**8.0**	8	20	150	Long Shank
SEMD9910005075E	R0.5	**10.0**	10	25	75	Short
SEMD9910010075E	R1.0	**10.0**	10	25	75	Short
SEMD9910001E	R0.1	**10.0**	10	25	100	Regular
SEMD9910002E	R0.2	**10.0**	10	25	100	Regular
SEMD9910005E	R0.5	**10.0**	10	25	100	Regular
SEMD9910010E	R1.0	**10.0**	10	25	100	Regular
SEMD9910015E	R1.5	**10.0**	10	25	100	Regular
SEMD9910020E	R2.0	**10.0**	10	25	100	Regular
SEMD9910025E	R2.5	**10.0**	10	25	100	Regular
SEMD9910030E	R3.0	**10.0**	10	25	100	Regular
SEMD9910040E	R4.0	**10.0**	10	25	100	Regular
SEMD9910005130E	R0.5	**10.0**	10	25	130	Long Shank
SEMD9910010130E	R1.0	**10.0**	10	25	130	Long Shank
SEMD9910005150E	R0.5	**10.0**	10	25	150	Long Shank
SEMD9910010150E	R1.0	**10.0**	10	25	150	Long Shank
SEMD9911002E	R0.2	**11.0**	12	25	110	-
SEMD9911003E	R0.3	**11.0**	12	25	110	-
SEMD9911005E	R0.5	**11.0**	12	25	110	-
SEMD9911010E	R1.0	**11.0**	12	25	110	-
SEMD9912005080E	R0.5	**12.0**	12	30	80	Short
SEMD9912010080E	R1.0	**12.0**	12	30	80	Short

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

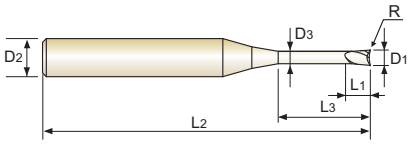
PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, torique, détalonnée
MD, 2 TAGLIENTI, SCARICATA, TORICA

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeo-metrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: standard und lang.
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 2,0mm Eckradius.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C316~C323

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6100200201E	R0.02	0.2	4	0.3	1	40	0.17	-
SEME61002002015E	R0.02	0.2	4	0.3	1.5	40	0.17	-
SEME6100200501E	R0.05	0.2	4	0.3	1	40	0.17	-
SEME61002005015E	R0.05	0.2	4	0.3	1.5	40	0.17	-
SEME6100300201E	R0.02	0.3	4	0.5	1	40	0.27	-
SEME6100300202E	R0.02	0.3	4	0.5	2	40	0.27	-
SEME6100300501E	R0.05	0.3	4	0.5	1	40	0.27	-
SEME6100300502E	R0.05	0.3	4	0.5	2	40	0.27	-
SEME6100300503E	R0.05	0.3	4	0.5	3	40	0.27	-
SEME6100400501E	R0.05	0.4	4	0.6	1	40	0.37	-
SEME61004005015E	R0.05	0.4	4	0.6	1.5	40	0.37	-
SEME6100400502E	R0.05	0.4	4	0.6	2	40	0.37	-
SEME61004005025E	R0.05	0.4	4	0.6	2.5	40	0.37	-
SEME6100400503E	R0.05	0.4	4	0.6	3	40	0.37	-
SEME610040101E	R0.1	0.4	4	0.6	1	40	0.37	-
SEME6100401015E	R0.1	0.4	4	0.6	1.5	40	0.37	-
SEME610040102E	R0.1	0.4	4	0.6	2	40	0.37	-
SEME610040103E	R0.1	0.4	4	0.6	3	40	0.37	-
SEME610040104E	R0.1	0.4	4	0.6	4	40	0.37	-
SEME6100500501E	R0.05	0.5	4	0.7	1	45	0.45	-
SEME61005005015E	R0.05	0.5	4	0.7	1.5	45	0.45	-
SEME6100500502E	R0.05	0.5	4	0.7	2	45	0.45	-
SEME61005005025E	R0.05	0.5	4	0.7	2.5	45	0.45	-
SEME6100500503E	R0.05	0.5	4	0.7	3	45	0.45	-

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

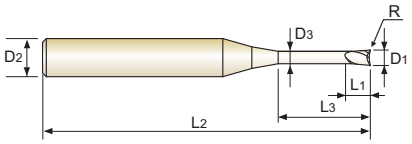
PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, torique, détalonnée
MD, 2 TAGLIENTI, SCARICATA, TORICA

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeo-metrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: standard und lang.
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 2,0mm Eckradius.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C316~C323

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610060210E	R0.2	0.6	4	0.9	10	45	0.55	-
SEME6100700504E	R0.05	0.7	4	1.2	4	45	0.65	-
SEME6100700508E	R0.05	0.7	4	1.2	8	45	0.65	-
SEME610070102E	R0.1	0.7	4	1.2	2	45	0.65	-
SEME610070104E	R0.1	0.7	4	1.2	4	45	0.65	-
SEME610070106E	R0.1	0.7	4	1.2	6	45	0.65	-
SEME610070108E	R0.1	0.7	4	1.2	8	45	0.65	-
SEME610070110E	R0.1	0.7	4	1.2	10	45	0.65	-
SEME610070202E	R0.2	0.7	4	1.2	2	45	0.65	-
SEME610070204E	R0.2	0.7	4	1.2	4	45	0.65	-
SEME610070206E	R0.2	0.7	4	1.2	6	45	0.65	-
SEME610070208E	R0.2	0.7	4	1.2	8	45	0.65	-
SEME6100800502E	R0.05	0.8	4	1.2	2	45	0.75	-
SEME6100800504E	R0.05	0.8	4	1.2	4	45	0.75	-
SEME6100800506E	R0.05	0.8	4	1.2	6	45	0.75	-
SEME6100800508E	R0.05	0.8	4	1.2	8	45	0.75	-
SEME610080103E	R0.1	0.8	4	1.2	3	45	0.75	-
SEME610080104E	R0.1	0.8	4	1.2	4	45	0.75	-
SEME610080106E	R0.1	0.8	4	1.2	6	45	0.75	-
SEME610080108E	R0.1	0.8	4	1.2	8	45	0.75	-
SEME610080110E	R0.1	0.8	4	1.2	10	45	0.75	-
SEME610080202E	R0.2	0.8	4	1.2	2	45	0.75	-
SEME610080203E	R0.2	0.8	4	1.2	3	45	0.75	-
SEME610080204E	R0.2	0.8	4	1.2	4	45	0.75	-

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, torique, détalonnée
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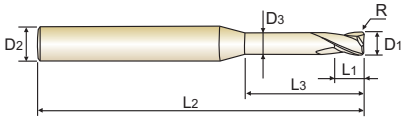
- Erhältlich in den Schaft-Ausführungen: standard und lang.
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 2,0mm Eckradius.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C316~C323

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610100210E	R0.2	1.0	4	1.5	10	50	0.95	-
SEME610100212E	R0.2	1.0	4	1.5	12	50	0.95	-
SEME610100214E	R0.2	1.0	4	1.5	14	50	0.95	-
SEME610100216E	R0.2	1.0	4	1.5	16	50	0.95	-
SEME610100220E	R0.2	1.0	4	1.5	20	50	0.95	-
SEME610100303E	R0.3	1.0	4	1.5	3	50	0.95	-
SEME610100304E	R0.3	1.0	4	1.5	4	50	0.95	-
SEME610100306E	R0.3	1.0	4	1.5	6	50	0.95	-
SEME610100308E	R0.3	1.0	4	1.5	8	50	0.95	-
SEME610100310E	R0.3	1.0	4	1.5	10	50	0.95	-
SEME610100314E	R0.3	1.0	4	1.5	14	50	0.95	-
SEME610100316E	R0.3	1.0	4	1.5	16	50	0.95	-
SEME6101200504E	R0.05	1.2	4	1.8	4	50	1.15	-
SEME6101200508E	R0.05	1.2	4	1.8	8	50	1.15	-
SEME6101200510E	R0.05	1.2	4	1.8	10	50	1.15	-
SEME6101200512E	R0.05	1.2	4	1.8	12	50	1.15	-
SEME610120104E	R0.1	1.2	4	1.8	4	50	1.15	-
SEME610120106E	R0.1	1.2	4	1.8	6	50	1.15	-
SEME610120110E	R0.1	1.2	4	1.8	10	50	1.15	-
SEME610120116E	R0.1	1.2	4	1.8	16	50	1.15	-
SEME610120203E	R0.2	1.2	4	1.8	3	50	1.15	-
SEME610120204E	R0.2	1.2	4	1.8	4	50	1.15	-
SEME610120206E	R0.2	1.2	4	1.8	6	50	1.15	-
SEME610120208E	R0.2	1.2	4	1.8	8	50	1.15	-

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
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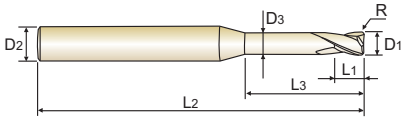

CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C316~C323

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610150210E	R0.2	1.5	4	2.3	10	50	1.45	-
SEME610150212E	R0.2	1.5	4	2.3	12	50	1.45	-
SEME610150214E	R0.2	1.5	4	2.3	14	50	1.45	-
SEME610150216E	R0.2	1.5	4	2.3	16	50	1.45	-
SEME610150220E	R0.2	1.5	4	2.3	20	50	1.45	-
SEME610150222E	R0.2	1.5	4	2.3	22	60	1.45	-
SEME610150226E	R0.2	1.5	4	2.3	26	60	1.45	-
SEME610150304E	R0.3	1.5	4	2.3	4	50	1.45	-
SEME610150306E	R0.3	1.5	4	2.3	6	50	1.45	-
SEME610150308E	R0.3	1.5	4	2.3	8	50	1.45	-
SEME610150310E	R0.3	1.5	4	2.3	10	50	1.45	-
SEME610150312E	R0.3	1.5	4	2.3	12	50	1.45	-
SEME610150314E	R0.3	1.5	4	2.3	14	50	1.45	-
SEME610150316E	R0.3	1.5	4	2.3	16	50	1.45	-
SEME610150320E	R0.3	1.5	4	2.3	20	50	1.45	-
SEME610150322E	R0.3	1.5	4	2.3	22	60	1.45	-
SEME610150326E	R0.3	1.5	4	2.3	26	60	1.45	-
SEME610150504E	R0.5	1.5	4	2.3	4	50	1.45	-
SEME610150506E	R0.5	1.5	4	2.3	6	50	1.45	-
SEME610150508E	R0.5	1.5	4	2.3	8	50	1.45	-
SEME610150510E	R0.5	1.5	4	2.3	10	50	1.45	-
SEME610150512E	R0.5	1.5	4	2.3	12	50	1.45	-
SEME610150516E	R0.5	1.5	4	2.3	16	50	1.45	-
SEME610150520E	R0.5	1.5	4	2.3	20	50	1.45	-

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

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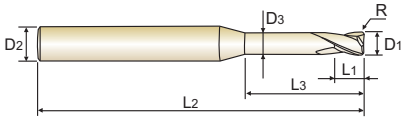
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeo-metrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: standard und lang.
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 2,0mm Eckradius.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C316~C323

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610200316E	R0.3	2.0	4	3	16	50	1.95	-
SEME610200320E	R0.3	2.0	4	3	20	50	1.95	-
SEME610200326E	R0.3	2.0	4	3	26	60	1.95	-
SEME610200330E	R0.3	2.0	4	3	30	70	1.95	-
SEME610200506E	R0.5	2.0	4	3	6	50	1.95	-
SEME610200508E	R0.5	2.0	4	3	8	50	1.95	-
SEME610200510E	R0.5	2.0	4	3	10	50	1.95	-
SEME610200512E	R0.5	2.0	4	3	12	50	1.95	-
SEME610200514E	R0.5	2.0	4	3	14	50	1.95	-
SEME610200516E	R0.5	2.0	4	3	16	50	1.95	-
SEME610200520E	R0.5	2.0	4	3	20	50	1.95	-
SEME610200522E	R0.5	2.0	4	3	22	60	1.95	-
SEME610200526E	R0.5	2.0	4	3	26	60	1.95	-
SEME610200530E	R0.5	2.0	4	3	30	70	1.95	-
SEME6102005086SE	R0.5	2.0	6	3	8	50	1.95	
SEME610250108E	R0.1	2.5	4	4	8	50	2.40	-
SEME610250110E	R0.1	2.5	4	4	10	50	2.40	-
SEME610250112E	R0.1	2.5	4	4	12	50	2.40	-
SEME610250114E	R0.1	2.5	4	4	14	50	2.40	-
SEME610250116E	R0.1	2.5	4	4	16	50	2.40	-
SEME610250120E	R0.1	2.5	4	4	20	50	2.40	-
SEME610250126E	R0.1	2.5	4	4	26	60	2.40	-
SEME610250208E	R0.2	2.5	4	4	8	50	2.40	-
SEME610250210E	R0.2	2.5	4	4	10	50	2.40	-

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

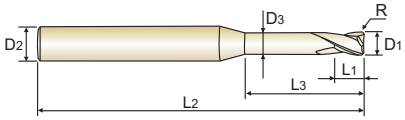
PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, torique, détalonnée
MD, 2 TAGLIENTI, SCARICATA, TORICA

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeo-metrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: standard und lang.
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 2,0mm Eckradius.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C316~C323

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610300130E	R0.1	3.0	6	4.5	30	70	2.85	-
SEME610300135E	R0.1	3.0	6	4.5	35	70	2.85	-
SEME610300140E	R0.1	3.0	6	4.5	40	80	2.85	-
SEME610300208E	R0.2	3.0	6	4.5	8	50	2.85	-
SEME610300210E	R0.2	3.0	6	4.5	10	50	2.85	-
SEME610300212E	R0.2	3.0	6	4.5	12	50	2.85	-
SEME610300216E	R0.2	3.0	6	4.5	16	60	2.85	-
SEME610300220E	R0.2	3.0	6	4.5	20	60	2.85	-
SEME610300230E	R0.2	3.0	6	4.5	30	70	2.85	-
SEME610300235E	R0.2	3.0	6	4.5	35	70	2.85	-
SEME610300240E	R0.2	3.0	6	4.5	40	80	2.85	-
SEME610300308E	R0.3	3.0	6	4.5	8	50	2.85	-
SEME610300310E	R0.3	3.0	6	4.5	10	50	2.85	-
SEME610300312E	R0.3	3.0	6	4.5	12	50	2.85	-
SEME610300314E	R0.3	3.0	6	4.5	14	60	2.85	-
SEME610300316E	R0.3	3.0	6	4.5	16	60	2.85	-
SEME610300320E	R0.3	3.0	6	4.5	20	60	2.85	-
SEME610300326E	R0.3	3.0	6	4.5	26	65	2.85	-
SEME610300330E	R0.3	3.0	6	4.5	30	70	2.85	-
SEME610300508E	R0.5	3.0	6	4.5	8	50	2.85	-
SEME610300510E	R0.5	3.0	6	4.5	10	50	2.85	-
SEME610300512E	R0.5	3.0	6	4.5	12	50	2.85	-
SEME610300514E	R0.5	3.0	6	4.5	14	60	2.85	-
SEME610300516E	R0.5	3.0	6	4.5	16	60	2.85	-

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Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

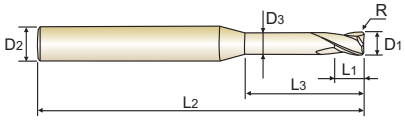
PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, torique, détalonnée
MD, 2 TAGLIENTI, SCARICATA, TORICA

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeo-metrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: standard und lang.
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 2,0mm Eckradius.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C316~C323

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610400212E	R0.2	4.0	6	6	12	50	3.85	-
SEME610400216E	R0.2	4.0	6	6	16	60	3.85	-
SEME610400220E	R0.2	4.0	6	6	20	60	3.85	-
SEME610400226E	R0.2	4.0	6	6	26	65	3.85	-
SEME610400230E	R0.2	4.0	6	6	30	70	3.85	-
SEME610400235E	R0.2	4.0	6	6	35	70	3.85	-
SEME610400245E	R0.2	4.0	6	6	45	90	3.85	-
SEME610400250E	R0.2	4.0	6	6	50	100	3.85	-
SEME610400310E	R0.3	4.0	6	6	10	50	3.85	-
SEME610400312E	R0.3	4.0	6	6	12	50	3.85	-
SEME610400316E	R0.3	4.0	6	6	16	50	3.85	-
SEME610400320E	R0.3	4.0	6	6	20	50	3.85	-
SEME610400326E	R0.3	4.0	6	6	26	65	3.85	-
SEME610400330E	R0.3	4.0	6	6	30	70	3.85	-
SEME610400335E	R0.3	4.0	6	6	35	70	3.85	-
SEME610400340E	R0.3	4.0	6	6	40	80	3.85	-
SEME610400345E	R0.3	4.0	6	6	45	90	3.85	-
SEME610400350E	R0.3	4.0	6	6	50	100	3.85	-
SEME610400510E	R0.5	4.0	6	6	10	50	3.85	-
SEME610400512E	R0.5	4.0	6	6	12	50	3.85	-
SEME610400514E	R0.5	4.0	6	6	14	60	3.85	-
SEME610400516E	R0.5	4.0	6	6	16	60	3.85	-
SEME610400520E	R0.5	4.0	6	6	20	60	3.85	-
SEME610400526E	R0.5	4.0	6	6	26	65	3.85	-

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Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

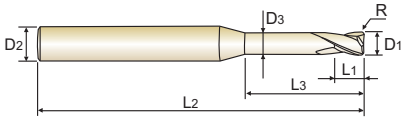
PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, torique, détalonnée
MD, 2 TAGLIENTI, SCARICATA, TORICA

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeo-metrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Erhältlich in den Schaft-Ausführungen: standard und lang.
- Erhältlich in verschiedenen Eckradien-Ausführungen: von 0,02mm bis zu 2,0mm Eckradius.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.2~Ø6) | R ±0.015 (Ø7~Ø20) | PLAIN | Y Coating

p.C316~C323

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6106003E	R0.3	6.0	6	9	20	60	5.85	Regular
SEME6106005E	R0.5	6.0	6	9	20	60	5.85	Regular
SEME6106010E	R1.0	6.0	6	9	20	60	5.85	Regular
SEME6106015E	R1.5	6.0	6	9	20	60	5.85	Regular
SEME6106020E	R2.0	6.0	6	9	20	60	5.85	Regular
SEME6106003090E	R0.3	6.0	6	15	30	90	5.85	Long Shank
SEME6106005090E	R0.5	6.0	6	15	30	90	5.85	Long Shank
SEME6106010090E	R1.0	6.0	6	15	30	90	5.85	Long Shank
SEME6108003E	R0.3	8.0	8	12	25	70	7.70	Regular
SEME6108005E	R0.5	8.0	8	12	25	70	7.70	Regular
SEME6108010E	R1.0	8.0	8	12	25	70	7.70	Regular
SEME6108015E	R1.5	8.0	8	12	25	70	7.70	Regular
SEME6108020E	R2.0	8.0	8	12	25	70	7.70	Regular
SEME6108003100E	R0.3	8.0	8	20	35	100	7.70	Long Shank
SEME6108005100E	R0.5	8.0	8	20	35	100	7.70	Long Shank
SEME6108010100E	R1.0	8.0	8	20	35	100	7.70	Long Shank
SEME6110002E	R0.2	10.0	10	15	30	75	9.70	Regular
SEME6110003E	R0.3	10.0	10	15	30	75	9.70	Regular
SEME6110005E	R0.5	10.0	10	15	30	75	9.70	Regular
SEME6110010E	R1.0	10.0	10	15	30	75	9.70	Regular
SEME6110003100E	R0.3	10.0	10	25	40	100	9.70	Long Shank
SEME6110005100E	R0.5	10.0	10	25	40	100	9.70	Long Shank
SEME6110010100E	R1.0	10.0	10	25	40	100	9.70	Long Shank
SEME6112002E	R0.2	12.0	12	18	32	80	11.70	Regular

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Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

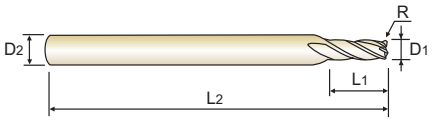
PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS (Short, Regular, Long Shank)

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS
Fraise carbure, 4 dents, torique, hélice multiple
MD, 4 TAGLIENTI, TORICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- Available in short, regular and long shank end mills.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.
- Erhältlich in den Schaft-Ausführungen: standard und lang.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C324~C325

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME01010005E	R0.05	1.0	6	2.5	50	-
SEME0101001E	R0.1	1.0	6	2.5	50	-
SEME0101002E	R0.2	1.0	6	2.5	50	-
SEME0101003E	R0.3	1.0	6	2.5	50	-
SEME01012005E	R0.05	1.2	6	3	50	-
SEME0101201E	R0.1	1.2	6	3	50	-
SEME0101202E	R0.2	1.2	6	3	50	-
SEME0101203E	R0.3	1.2	6	3	50	-
SEME01015005E	R0.05	1.5	6	4	50	-
SEME0101501E	R0.1	1.5	6	4	50	-
SEME0101502E	R0.2	1.5	6	4	50	-
SEME0101503E	R0.3	1.5	6	4	50	-
SEME0102001E	R0.1	2.0	6	6	50	-
SEME0102002E	R0.2	2.0	6	6	50	-
SEME0102003E	R0.3	2.0	6	6	50	-
SEME0102005E	R0.5	2.0	6	6	50	-
SEME0102501E	R0.1	2.5	6	7	60	-
SEME0102502E	R0.2	2.5	6	7	60	-
SEME0102503E	R0.3	2.5	6	7	60	-
SEME0102505E	R0.5	2.5	6	7	60	-
SEME0103001E	R0.1	3.0	6	8	60	-
SEME0103002E	R0.2	3.0	6	8	60	-
SEME0103003E	R0.3	3.0	6	8	60	-
SEME0103005E	R0.5	3.0	6	8	60	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

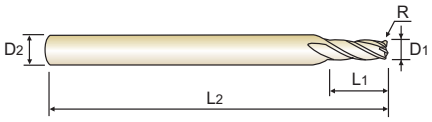
PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS (Short, Regular, Long Shank)

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS
Fraise carbure, 4 dents, torique, hélice multiple
MD, 4 TAGLIENTI, TORICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- Available in short, regular and long shank end mills.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.
- Erhältlich in den Schaft-Ausführungen: standard und lang.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C324~C325

D<Ø3, 30° HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0105003E	R0.3	5.0	6	13	90	-
SEME0105005E	R0.5	5.0	6	13	90	-
SEME0105010E	R1.0	5.0	6	13	90	-
SEME0105502E	R0.2	5.5	6	13	90	-
SEME0105503E	R0.3	5.5	6	13	90	-
SEME0105505E	R0.5	5.5	6	13	90	-
SEME0105510E	R1.0	5.5	6	13	90	-
SEME0106001060E	R0.1	6.0	6	15	60	Short
SEME0106002060E	R0.2	6.0	6	15	60	Short
SEME0106001E	R0.1	6.0	6	15	90	Regular
SEME0106002E	R0.2	6.0	6	15	90	Regular
SEME0106003E	R0.3	6.0	6	15	90	Regular
SEME0106005E	R0.5	6.0	6	15	90	Regular
SEME0106010E	R1.0	6.0	6	15	90	Regular
SEME0106015E	R1.5	6.0	6	15	90	Regular
SEME0106020E	R2.0	6.0	6	15	90	Regular
SEME0106005110E	R0.5	6.0	6	15	110	Long Shank
SEME0106010110E	R1.0	6.0	6	15	110	Long Shank
SEME0106005130E	R0.5	6.0	6	15	130	Long Shank
SEME0106010130E	R1.0	6.0	6	15	130	Long Shank
SEME0107001E	R0.1	7.0	8	16	90	-
SEME0107002E	R0.2	7.0	8	16	90	-
SEME0107005E	R0.5	7.0	8	16	90	-
SEME0108003070E	R0.3	8.0	8	20	70	Short

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

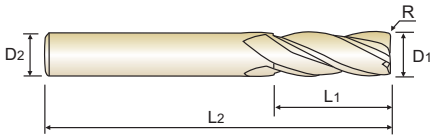
PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS (Short, Regular, Long Shank)

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS
Fraise carbure, 4 dents, torique, hélice multiple
VMD, 4 TAGLIENTI, TORICA (Serie corta, media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
- Available in short, regular and long shank end mills.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.
- Erhältlich in den Schaft-Ausführungen: standard und lang.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C324~C325

D<Ø3, 30° HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0110020E	R2.0	10.0	10	25	100	Regular
SEME0110025E	R2.5	10.0	10	25	100	Regular
SEME0110030E	R3.0	10.0	10	25	100	Regular
SEME0110040E	R4.0	10.0	10	25	100	Regular
SEME0110005130E	R0.5	10.0	10	22	130	Long Shank
SEME0110010130E	R1.0	10.0	10	22	130	Long Shank
SEME0110005150E	R0.5	10.0	10	22	150	Long Shank
SEME0110010150E	R1.0	10.0	10	22	150	Long Shank
SEME0111002E	R0.2	11.0	12	25	110	-
SEME0111003E	R0.3	11.0	12	25	110	-
SEME0111005E	R0.5	11.0	12	25	110	-
SEME0111010E	R1.0	11.0	12	25	110	-
SEME0112003080E	R0.3	12.0	12	30	80	Short
SEME0112005080E	R0.5	12.0	12	30	80	Short
SEME0112010080E	R1.0	12.0	12	30	80	Short
SEME0112001E	R0.1	12.0	12	30	110	Regular
SEME0112002E	R0.2	12.0	12	30	110	Regular
SEME0112003E	R0.3	12.0	12	30	110	Regular
SEME0112005E	R0.5	12.0	12	30	110	Regular
SEME0112010E	R1.0	12.0	12	30	110	Regular
SEME0112015E	R1.5	12.0	12	30	110	Regular
SEME0112020E	R2.0	12.0	12	30	110	Regular
SEME0112025E	R2.5	12.0	12	30	110	Regular
SEME0112030E	R3.0	12.0	12	30	110	Regular

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

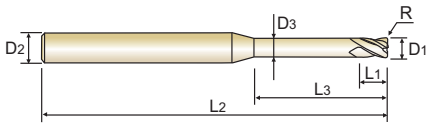
PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 4 dents, torique, hélice multiple, détalonnée
MD, 4 TAGLIENTI, SCARICATA, TORICA

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.

- ▶ Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- ▶ Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- ▶ Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C326~C329

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6401000503E	R0.05	1.0	4	1.5	3	50	0.95	-
SEME6401000506E	R0.05	1.0	4	1.5	6	50	0.95	-
SEME6401000508E	R0.05	1.0	4	1.5	8	50	0.95	-
SEME6401000512E	R0.05	1.0	4	1.5	12	50	0.95	-
SEME6401000514E	R0.05	1.0	4	1.5	14	50	0.95	-
SEME640100104E	R0.1	1.0	4	1.5	4	50	0.95	-
SEME640100106E	R0.1	1.0	4	1.5	6	50	0.95	-
SEME640100108E	R0.1	1.0	4	1.5	8	50	0.95	-
SEME640100110E	R0.1	1.0	4	1.5	10	50	0.95	-
SEME640100112E	R0.1	1.0	4	1.5	12	50	0.95	-
SEME640100114E	R0.1	1.0	4	1.5	14	50	0.95	-
SEME640100116E	R0.1	1.0	4	1.5	16	50	0.95	-
SEME640100120E	R0.1	1.0	4	1.5	20	50	0.95	-
SEME640100203E	R0.2	1.0	4	1.5	3	50	0.95	-
SEME640100204E	R0.2	1.0	4	1.5	4	50	0.95	-
SEME640100206E	R0.2	1.0	4	1.5	6	50	0.95	-
SEME640100208E	R0.2	1.0	4	1.5	8	50	0.95	-
SEME640100210E	R0.2	1.0	4	1.5	10	50	0.95	-
SEME640100212E	R0.2	1.0	4	1.5	12	50	0.95	-
SEME640100214E	R0.2	1.0	4	1.5	14	50	0.95	-
SEME640100216E	R0.2	1.0	4	1.5	16	50	0.95	-
SEME640100220E	R0.2	1.0	4	1.5	20	50	0.95	-
SEME640100303E	R0.3	1.0	4	1.5	3	50	0.95	-
SEME640100304E	R0.3	1.0	4	1.5	4	50	0.95	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 4 dents, torique, hélice multiple, détalonnée
MD, 4 TAGLIENTI, SCARICATA, TORICA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
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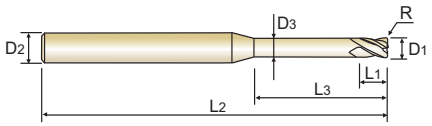
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C326~C329

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640120306E	R0.3	1.2	4	1.8	6	50	1.15	-
SEME640120308E	R0.3	1.2	4	1.8	8	50	1.15	-
SEME640120312E	R0.3	1.2	4	1.8	12	50	1.15	-
SEME640120316E	R0.3	1.2	4	1.8	16	50	1.15	-
SEME640120320E	R0.3	1.2	4	1.8	20	50	1.15	-
SEME6401500504E	R0.05	1.5	4	2.3	4	50	1.45	-
SEME6401500510E	R0.05	1.5	4	2.3	10	50	1.45	-
SEME6401500512E	R0.05	1.5	4	2.3	12	50	1.45	-
SEME6401500514E	R0.05	1.5	4	2.3	14	50	1.45	-
SEME6401500516E	R0.05	1.5	4	2.3	16	50	1.45	-
SEME6401500522E	R0.05	1.5	4	2.3	22	60	1.45	-
SEME640150104E	R0.1	1.5	4	2.3	4	50	1.45	-
SEME640150106E	R0.1	1.5	4	2.3	6	50	1.45	-
SEME640150108E	R0.1	1.5	4	2.3	8	50	1.45	-
SEME640150110E	R0.1	1.5	4	2.3	10	50	1.45	-
SEME640150112E	R0.1	1.5	4	2.3	12	50	1.45	-
SEME640150114E	R0.1	1.5	4	2.3	14	50	1.45	-
SEME640150116E	R0.1	1.5	4	2.3	16	50	1.45	-
SEME640150204E	R0.2	1.5	4	2.3	4	50	1.45	-
SEME640150206E	R0.2	1.5	4	2.3	6	50	1.45	-
SEME640150208E	R0.2	1.5	4	2.3	8	50	1.45	-
SEME640150210E	R0.2	1.5	4	2.3	10	50	1.45	-
SEME640150212E	R0.2	1.5	4	2.3	12	50	1.45	-
SEME640150214E	R0.2	1.5	4	2.3	14	50	1.45	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

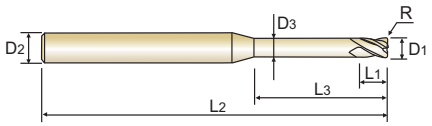
PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 4 dents, torique, hélice multiple, détalonnée
MD, 4 TAGLIENTI, SCARICATA, TORICA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C326~C329

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640200112E	R0.1	2.0	4	3	12	50	1.95	-
SEME640200114E	R0.1	2.0	4	3	14	50	1.95	-
SEME640200116E	R0.1	2.0	4	3	16	50	1.95	-
SEME640200120E	R0.1	2.0	4	3	20	50	1.95	-
SEME640200122E	R0.1	2.0	4	3	22	60	1.95	-
SEME640200126E	R0.1	2.0	4	3	26	60	1.95	-
SEME640200130E	R0.1	2.0	4	3	30	70	1.95	-
SEME640200206E	R0.2	2.0	4	3	6	50	1.95	-
SEME640200208E	R0.2	2.0	4	3	8	50	1.95	-
SEME640200210E	R0.2	2.0	4	3	10	50	1.95	-
SEME640200212E	R0.2	2.0	4	3	12	50	1.95	-
SEME640200214E	R0.2	2.0	4	3	14	50	1.95	-
SEME640200216E	R0.2	2.0	4	3	16	50	1.95	-
SEME640200220E	R0.2	2.0	4	3	20	50	1.95	-
SEME640200222E	R0.2	2.0	4	3	22	60	1.95	-
SEME640200226E	R0.2	2.0	4	3	26	60	1.95	-
SEME640200230E	R0.2	2.0	4	3	30	70	1.95	-
SEME640200306E	R0.3	2.0	4	3	6	50	1.95	-
SEME640200308E	R0.3	2.0	4	3	8	50	1.95	-
SEME640200310E	R0.3	2.0	4	3	10	50	1.95	-
SEME640200312E	R0.3	2.0	4	3	12	50	1.95	-
SEME640200314E	R0.3	2.0	4	3	14	50	1.95	-
SEME640200316E	R0.3	2.0	4	3	16	50	1.95	-
SEME640200320E	R0.3	2.0	4	3	20	50	1.95	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 4 dents, torique, hélice multiple, détalonnée
MD, 4 TAGLIENTI, SCARICATA, TORICA

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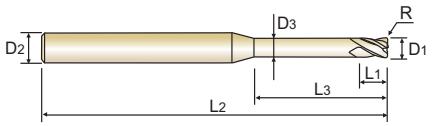
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.

- ▶ Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- ▶ Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- ▶ Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C326~C329

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640250312E	R0.3	2.5	4	4	12	50	2.40	-
SEME640250314E	R0.3	2.5	4	4	14	50	2.40	-
SEME640250316E	R0.3	2.5	4	4	16	50	2.40	-
SEME640250320E	R0.3	2.5	4	4	20	50	2.40	-
SEME640250326E	R0.3	2.5	4	4	26	60	2.40	-
SEME640250508E	R0.5	2.5	4	4	8	50	2.40	-
SEME640250510E	R0.5	2.5	4	4	10	50	2.40	-
SEME640250512E	R0.5	2.5	4	4	12	50	2.40	-
SEME640250514E	R0.5	2.5	4	4	14	50	2.40	-
SEME640250520E	R0.5	2.5	4	4	20	50	2.40	-
SEME640250526E	R0.5	2.5	4	4	26	60	2.40	-
SEME640250530E	R0.5	2.5	4	4	30	70	2.40	-
SEME640300108E	R0.1	3.0	6	4.5	8	50	2.85	-
SEME640300110E	R0.1	3.0	6	4.5	10	50	2.85	-
SEME640300112E	R0.1	3.0	6	4.5	12	50	2.85	-
SEME640300114E	R0.1	3.0	6	4.5	14	60	2.85	-
SEME640300116E	R0.1	3.0	6	4.5	16	60	2.85	-
SEME640300120E	R0.1	3.0	6	4.5	20	60	2.85	-
SEME640300126E	R0.1	3.0	6	4.5	26	65	2.85	-
SEME640300130E	R0.1	3.0	6	4.5	30	70	2.85	-
SEME640300135E	R0.1	3.0	6	4.5	35	70	2.85	-
SEME640300140E	R0.1	3.0	6	4.5	40	80	2.85	-
SEME640300208E	R0.2	3.0	6	4.5	8	50	2.85	-
SEME640300210E	R0.2	3.0	6	4.5	10	50	2.85	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 4 dents, torique, hélice multiple, détalonnée
MD, 4 TAGLIENTI, SCARICATA, TORICA

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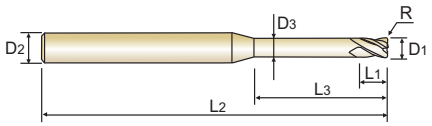
- ▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.

- ▶ Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- ▶ Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- ▶ Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C326~C329

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640300530E	R0.5	3.0	6	4.5	30	70	2.85	-
SEME640300535E	R0.5	3.0	6	4.5	35	70	2.85	-
SEME640300540E	R0.5	3.0	6	4.5	40	80	2.85	-
SEME640301008E	R1.0	3.0	6	4.5	8	50	2.85	-
SEME640301010E	R1.0	3.0	6	4.5	10	50	2.85	-
SEME640301012E	R1.0	3.0	6	4.5	12	50	2.85	-
SEME640301014E	R1.0	3.0	6	4.5	14	60	2.85	-
SEME640301016E	R1.0	3.0	6	4.5	16	60	2.85	-
SEME640301020E	R1.0	3.0	6	4.5	20	60	2.85	-
SEME640301026E	R1.0	3.0	6	4.5	26	65	2.85	-
SEME640301035E	R1.0	3.0	6	4.5	35	70	2.85	-
SEME640400110E	R0.1	4.0	6	6	10	50	3.85	-
SEME640400112E	R0.1	4.0	6	6	12	50	3.85	-
SEME640400116E	R0.1	4.0	6	6	16	60	3.85	-
SEME640400120E	R0.1	4.0	6	6	20	60	3.85	-
SEME640400126E	R0.1	4.0	6	6	26	65	3.85	-
SEME640400130E	R0.1	4.0	6	6	30	70	3.85	-
SEME640400135E	R0.1	4.0	6	6	35	70	3.85	-
SEME640400140E	R0.1	4.0	6	6	40	80	3.85	-
SEME640400150E	R0.1	4.0	6	6	50	100	3.85	-
SEME640400210E	R0.2	4.0	6	6	10	50	3.85	-
SEME640400212E	R0.2	4.0	6	6	12	50	3.85	-
SEME640400214E	R0.2	4.0	6	6	14	60	3.85	-
SEME640400216E	R0.2	4.0	6	6	16	60	3.85	-

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
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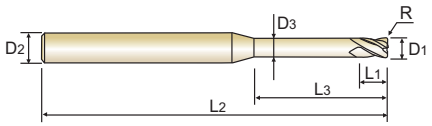


CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C326~C329

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640400535E	R0.5	4.0	6	6	35	70	3.85	-
SEME640400540E	R0.5	4.0	6	6	40	80	3.85	-
SEME640400550E	R0.5	4.0	6	6	50	100	3.85	-
SEME640401010E	R1.0	4.0	6	6	10	50	3.85	-
SEME640401012E	R1.0	4.0	6	6	12	50	3.85	-
SEME640401014E	R1.0	4.0	6	6	14	60	3.85	-
SEME640401016E	R1.0	4.0	6	6	16	60	3.85	-
SEME640401020E	R1.0	4.0	6	6	20	60	3.85	-
SEME640401026E	R1.0	4.0	6	6	26	65	3.85	-
SEME640401030E	R1.0	4.0	6	6	30	70	3.85	-
SEME640401035E	R1.0	4.0	6	6	35	70	3.85	-
SEME640401040E	R1.0	4.0	6	6	40	80	3.85	-
SEME640401050E	R1.0	4.0	6	6	50	100	3.85	-
SEME6405001E	R0.1	5.0	6	8	15	60	4.85	-
SEME6405002E	R0.2	5.0	6	8	15	60	4.85	-
SEME6405003E	R0.3	5.0	6	8	15	60	4.85	-
SEME6405005E	R0.5	5.0	6	8	15	60	4.85	-
SEME6405010E	R1.0	5.0	6	8	15	60	4.85	-
SEME6405015E	R1.5	5.0	6	8	15	60	4.85	-
SEME6405020E	R2.0	5.0	6	8	15	60	4.85	-
SEME6406001E	R0.1	6.0	6	9	20	60	5.85	Regular
SEME6406002E	R0.2	6.0	6	9	20	60	5.85	Regular
SEME6406003E	R0.3	6.0	6	9	20	60	5.85	Regular
SEME6406005E	R0.5	6.0	6	9	20	60	5.85	Regular

▶ NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

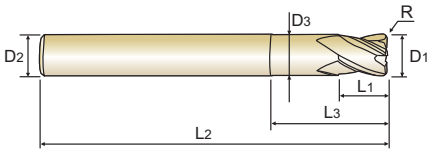
PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL ECKENRADIUS mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 4 dents, torique, hélice multiple, détalonnée
MD, 4 TAGLIENTI, SCARICATA, TORICA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C326~C329

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Corner Radius R (±0.02)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6410005100E	R0.5	10.0	10	25	40	100	9.70	Long Shank
SEME6410010100E	R1.0	10.0	10	25	40	100	9.70	Long Shank
SEME6412002E	R0.2	12.0	12	18	32	80	11.70	Regular
SEME6412003E	R0.3	12.0	12	18	32	80	11.70	Regular
SEME6412005E	R0.5	12.0	12	18	32	80	11.70	Regular
SEME6412010E	R1.0	12.0	12	18	32	80	11.70	Regular
SEME6412015E	R1.5	12.0	12	18	32	80	11.70	Regular
SEME6412020E	R2.0	12.0	12	18	32	80	11.70	Regular
SEME6412003110E	R0.3	12.0	12	30	50	110	11.70	Long Shank
SEME6412005110E	R0.5	12.0	12	30	50	110	11.70	Long Shank
SEME6412010110E	R1.0	12.0	12	30	50	110	11.70	Long Shank
SEME6416005E	R0.5	16.0	16	20	35	100	15.70	Regular
SEME6416010E	R1.0	16.0	16	20	35	100	15.70	Regular
SEME6416005150E	R0.5	16.0	16	35	50	150	15.70	Long Shank
SEME6420005E	R0.5	20.0	20	35	40	100	19.70	Regular
SEME6420010E	R1.0	20.0	20	35	40	100	19.70	Regular

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

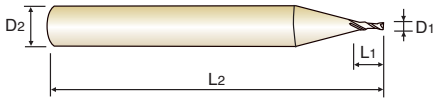
PLAIN SHANK **SEME35 SERIES**

CARBIDE, 2 FLUTE

VOLLHARTMETALL, 2 SCHNEIDEN
Fraise carbure, 2 dents
MD, 2 TAGLIENTI, SPIGOLO VIVO

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- From a sharp edge geometry at the end tooth, cutting abilities at work process is increased.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrund der scharfen Schneidengeometrie wird eine bessere Schnittfreudigkeit während der Bearbeitung gewährleistet.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C330~C333

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME35055E	5.5	6	15	60
SEME35060E	6.0	6	15	60
SEME35065E	6.5	8	18	60
SEME35070E	7.0	8	20	60
SEME35075E	7.5	8	20	60
SEME35080E	8.0	8	20	70
SEME35085E	8.5	10	22	70
SEME35090E	9.0	10	22	70
SEME35095E	9.5	10	24	70
SEME35100E	10.0	10	25	75
SEME35105E	10.5	12	26	75
SEME35110E	11.0	12	30	75
SEME35120E	12.0	12	30	80
SEME35130E	13.0	12	35	100
SEME3514014SE	14.0	14	35	100
SEME35140E	14.0	16	35	100
SEME35150E	15.0	16	38	100
SEME35160E	16.0	16	40	100
SEME35170E	17.0	16	42	100
SEME35180E	18.0	16	45	100
SEME3518018SE	18.0	18	45	100
SEME35200E	20.0	20	45	100
SEME35210E	21.0	20	45	100
SEME35220E	22.0	20	45	100

▶ NEXT PAGE

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0~ - 0.012	h5
over Ø6	0~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

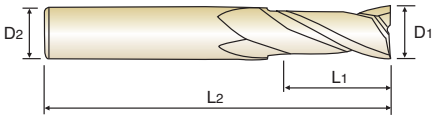
PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE (0.1mm a Unit / 4mm Shank)

VOLLHARTMETALL, 2 SCHNEIDEN
Fraise carbure, 2 dents (par 0.1mm / Ø queue 4mm)
MD, 2 TAGLIENTI, SPIGOLO VIVO (gambo 4 mm)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- From a sharp edge geometry at the end tooth, cutting abilities at work process is increased.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrund der scharfen Schneidengeometrie wird eine bessere Schnittfreudigkeit während der Bearbeitung gewährleistet.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C330~C333

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME350104SE	1.0	4	2.5	50
SEME350114SE	1.1	4	3	50
SEME350124SE	1.2	4	3	50
SEME350134SE	1.3	4	3	50
SEME350144SE	1.4	4	4	50
SEME350154SE	1.5	4	4	50
SEME350164SE	1.6	4	4	50
SEME350174SE	1.7	4	4	50
SEME350184SE	1.8	4	5	50
SEME350194SE	1.9	4	5	50
SEME350204SE	2.0	4	6	50
SEME350214SE	2.1	4	6	50
SEME350224SE	2.2	4	6	50
SEME350234SE	2.3	4	6	50
SEME350244SE	2.4	4	6	50
SEME350254SE	2.5	4	8	50
SEME350264SE	2.6	4	8	50
SEME350274SE	2.7	4	8	50
SEME350284SE	2.8	4	8	50
SEME350294SE	2.9	4	8	50
SEME350304SE	3.0	4	8	50
SEME350354SE	3.5	4	10	50
SEME350404SE	4.0	4	10	50
SEME350404S080E	4.0	4	10	80

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~ - 0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

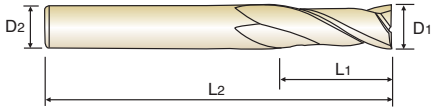
PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN LANG
Fraise carbure, 2 dents, longue
MD, 2 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available in various lengths of cut and also overall lengths.

- ▶ Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- ▶ Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- ▶ Erhältlich in verschiebenen Schneiden- und Gesamtlängen.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C334~C339

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
SEME7001003E	1.0	6	3	60
SEME7001004E	1.0	6	4	60
SEME7001005E	1.0	6	5	60
SEME7001006E	1.0	6	6	60
SEME7001008E	1.0	6	8	60
SEME7001010E	1.0	6	10	60
SEME7001012E	1.0	6	12	60
SEME7001204E	1.2	6	4	60
SEME7001206E	1.2	6	6	60
SEME7001208E	1.2	6	8	60
SEME7001210E	1.2	6	10	60
SEME7001506E	1.5	6	6	60
SEME7001508E	1.5	6	8	60
SEME7001510E	1.5	6	10	60
SEME7001512E	1.5	6	12	60
SEME7001514E	1.5	6	14	60
SEME7001516E	1.5	6	16	60
SEME7002008E	2.0	6	8	60
SEME7002010E	2.0	6	10	60
SEME7002012E	2.0	6	12	60
SEME7002014E	2.0	6	14	60
SEME7002016E	2.0	6	16	60
SEME7002510E	2.5	6	10	60
SEME7002512E	2.5	6	12	60

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

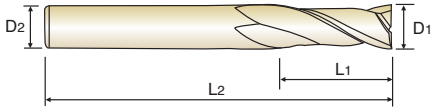
PLAIN SHANK **SEME70 SERIES**

CARBIDE, 2 FLUTE LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN LANG
Fraise carbure, 2 dents, longue
MD, 2 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available in various lengths of cut and also overall lengths.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Erhältlich in verschiebenen Schneiden- und Gesamtlängen.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C334~C339

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7006015080E	6.0	6	15	80
SEME7006020E	6.0	6	20	70
SEME7006020090E	6.0	6	20	90
SEME7006025E	6.0	6	25	75
SEME7006030E	6.0	6	30	80
SEME7006030100E	6.0	6	30	100
SEME7006030150E	6.0	6	30	150
SEME7006035E	6.0	6	35	90
SEME7006040E	6.0	6	40	90
SEME7006040120E	6.0	6	40	120
SEME7006045E	6.0	6	45	150
SEME7008025E	8.0	8	25	80
SEME7008030E	8.0	8	30	80
SEME7008030100E	8.0	8	30	100
SEME7008035E	8.0	8	35	90
SEME7008040E	8.0	8	40	90
SEME7008040150E	8.0	8	40	150
SEME7008045E	8.0	8	45	100
SEME7008050E	8.0	8	50	100
SEME7008050150E	8.0	8	50	150
SEME7010030E	10.0	10	30	80
SEME7010030100E	10.0	10	30	100
SEME7010035E	10.0	10	35	90
SEME7010040E	10.0	10	40	90

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

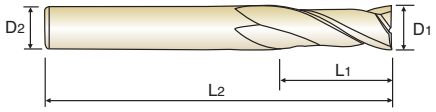
PLAIN SHANK **SEME70 SERIES**

CARBIDE, 2 FLUTE LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN LANG
Fraise carbure, 2 dents, longue
MD, 2 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- ▶ New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶ Available in various lengths of cut and also overall lengths.

- ▶ Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- ▶ Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- ▶ Erhältlich in verschiebenen Schneiden- und Gesamtlängen.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C334~C339

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME70160110E	16.0	16	110	200
SEME70160120E	16.0	16	120	250
SEME7018050E	18.0	20	50	120
SEME7018070E	18.0	20	70	130
SEME70180100E	18.0	20	100	200
SEME7020050E	20.0	20	50	110
SEME7020060E	20.0	20	60	130
SEME7020070E	20.0	20	70	130
SEME7020090E	20.0	20	90	150
SEME7020090200E	20.0	20	90	200
SEME7022075E	22.0	20	75	150
SEME70220110E	22.0	20	110	200
SEME7025090E	25.0	25	90	150
SEME70250120E	25.0	25	120	250

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

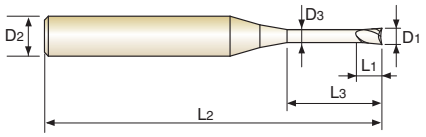
PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, détalonnée
MD, 2 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
- Available in several effective lengths of cut and also overall lengths to apply on various rib processing.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Bei Fräsern mit einem ø ≤ 1,0mm gewährleistet die "Doppel-Hals-Geometrie" eine erhöhte Werkzeugsteifigkeit und minimiert Vibrationen während der Bearbeitung.
- Die Auswahl an verschiedenen Effektiv- und Gesamt-Längen der Werkzeuge ermöglicht die Herstellung der verschiedensten Steg- und Rippen-Variationen.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C340~C349

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84500505E	0.5	4	0.7	5	45	0.45
SEM84500506E	0.5	4	0.7	6	45	0.45
SEM84500508E	0.5	4	0.7	8	45	0.45
SEM84500510E	0.5	4	0.7	10	45	0.45
SEM84500512E	0.5	4	0.7	12	45	0.45
SEM84500516E	0.5	4	0.7	16	45	0.45
SEM84500602E	0.6	4	0.9	2	45	0.55
SEM84500603E	0.6	4	0.9	3	45	0.55
SEM84500604E	0.6	4	0.9	4	45	0.55
SEM84500605E	0.6	4	0.9	5	45	0.55
SEM84500606E	0.6	4	0.9	6	45	0.55
SEM84500608E	0.6	4	0.9	8	45	0.55
SEM84500610E	0.6	4	0.9	10	45	0.55
SEM84500612E	0.6	4	0.9	12	45	0.55
SEM84500702E	0.7	4	1.2	2	45	0.65
SEM84500704E	0.7	4	1.2	4	45	0.65
SEM84500706E	0.7	4	1.2	6	45	0.65
SEM84500708E	0.7	4	1.2	8	45	0.65
SEM84500710E	0.7	4	1.2	10	45	0.65
SEM84500712E	0.7	4	1.2	12	45	0.65
SEM84500802E	0.8	4	1.2	2	45	0.75
SEM84500803E	0.8	4	1.2	3	45	0.75
SEM84500804E	0.8	4	1.2	4	45	0.75
SEM84500805E	0.8	4	1.2	5	45	0.75

▶ NEXT PAGE

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0 ~ - 0.012	h5
over Ø6	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

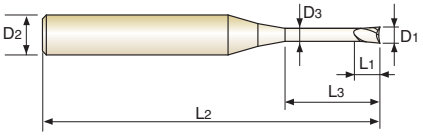
PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, détalonnée
MD, 2 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
- Available in several effective lengths of cut and also overall lengths to apply on various rib processing.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Bei Fräsern mit einem ø ≤ 1,0mm gewährleistet die "Doppel-Hals-Geometrie" eine erhöhte Werkzeugsteifigkeit und minimiert Vibrationen während der Bearbeitung.
- Die Auswahl an verschiedenen Effektiv- und Gesamt-Längen der Werkzeuge ermöglicht die Herstellung der verschiedensten Steg- und Rippen-Variationen.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C340~C349

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
SEM84501204E	1.2	4	1.8	4	50	1.15
SEM84501206E	1.2	4	1.8	6	50	1.15
SEM84501208E	1.2	4	1.8	8	50	1.15
SEM84501210E	1.2	4	1.8	10	50	1.15
SEM84501212E	1.2	4	1.8	12	50	1.15
SEM84501216E	1.2	4	1.8	16	50	1.15
SEM84501226E	1.2	4	1.8	26	60	1.15
SEM84501230E	1.2	4	1.8	30	70	1.15
SEM84501406E	1.4	4	2.1	6	50	1.35
SEM84501408E	1.4	4	2.1	8	50	1.35
SEM84501410E	1.4	4	2.1	10	50	1.35
SEM84501414E	1.4	4	2.1	14	50	1.35
SEM84501416E	1.4	4	2.1	16	50	1.35
SEM84501420E	1.4	4	2.1	20	50	1.35
SEM84501504E	1.5	4	2.3	4	50	1.45
SEM84501505E	1.5	4	2.3	5	50	1.45
SEM84501506E	1.5	4	2.3	6	50	1.45
SEM84501508E	1.5	4	2.3	8	50	1.45
SEM84501510E	1.5	4	2.3	10	50	1.45
SEM84501512E	1.5	4	2.3	12	50	1.45
SEM84501514E	1.5	4	2.3	14	50	1.45
SEM84501516E	1.5	4	2.3	16	50	1.45
SEM84501518E	1.5	4	2.3	18	50	1.45
SEM84501520E	1.5	4	2.3	20	50	1.45

▶ NEXT PAGE

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0 ~ - 0.012	h5
over Ø6	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

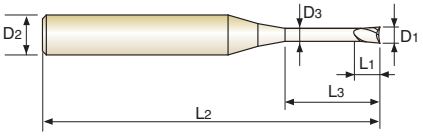
PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, détalonnée
MD, 2 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
- Available in several effective lengths of cut and also overall lengths to apply on various rib processing.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Bei Fräsern mit einem ø ≤ 1,0mm gewährleistet die "Doppel-Hals-Geometrie" eine erhöhte Werkzeugsteifigkeit und minimiert Vibrationen während der Bearbeitung.
- Die Auswahl an verschiedenen Effektiv- und Gesamt-Längen der Werkzeuge ermöglicht die Herstellung der verschiedensten Steg- und Rippen-Variationen.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C340~C349

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84502040E	2.0	4	3	40	80	1.95
SEM84502045E	2.0	4	3	45	90	1.95
SEM84502050E	2.0	4	3	50	100	1.95
SEM84502060E	2.0	4	3	60	110	1.95
SEM84502508E	2.5	4	4	8	50	2.40
SEM84502512E	2.5	4	4	12	50	2.40
SEM84502514E	2.5	4	4	14	50	2.40
SEM84502516E	2.5	4	4	16	50	2.40
SEM84502520E	2.5	4	4	20	50	2.40
SEM84502522E	2.5	4	4	22	60	2.40
SEM84502526E	2.5	4	4	26	60	2.40
SEM84502530E	2.5	4	4	30	70	2.40
SEM84502535E	2.5	4	4	35	70	2.40
SEM84502540E	2.5	4	4	40	80	2.40
SEM84503006E	3.0	6	4.5	6	50	2.85
SEM84503008E	3.0	6	4.5	8	50	2.85
SEM84503010E	3.0	6	4.5	10	50	2.85
SEM84503012E	3.0	6	4.5	12	50	2.85
SEM84503014E	3.0	6	4.5	14	60	2.85
SEM84503016E	3.0	6	4.5	16	60	2.85
SEM84503018E	3.0	6	4.5	18	60	2.85
SEM84503020E	3.0	6	4.5	20	60	2.85
SEM84503026E	3.0	6	4.5	26	65	2.85
SEM84503030E	3.0	6	4.5	30	70	2.85

▶ NEXT PAGE

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0 ~ - 0.012	h5
over Ø6	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

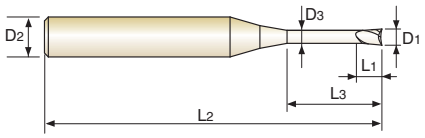
PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 2 dents, détalonnée
MD, 2 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter size products, it is designed with a double neck to increase tool rigidity and to minimize vibration.
- Available in several effective lengths of cut and also overall lengths to apply on various rib processing.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Bei Fräsern mit einem ø ≤ 1,0mm gewährleistet die "Doppel-Hals-Geometrie" eine erhöhte Werkzeugsteifigkeit und minimiert Vibrationen während der Bearbeitung.
- Die Auswahl an verschiedenen Effektiv- und Gesamt-Längen der Werkzeuge ermöglicht die Herstellung der verschiedensten Steg- und Rippen-Variationen.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C340~C349

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84505060E	5.0	6	8	60	100	4.85
SEM84506015E	6.0	6	9	15	60	5.85
SEM84506020E	6.0	6	9	20	60	5.85
SEM84506030E	6.0	6	9	30	70	5.85
SEM84506032E	6.0	6	9	32	90	5.85
SEM84508025E	8.0	8	12	25	70	7.70
SEM84508030E	8.0	8	12	30	80	7.70
SEM84508042E	8.0	8	12	42	100	7.70
SEM84510030E	10.0	10	15	30	75	9.70
SEM84510035E	10.0	10	15	35	80	9.70
SEM84510045E	10.0	10	15	45	100	9.70
SEM84512035E	12.0	12	20	35	80	11.70
SEM84512040E	12.0	12	20	40	90	11.70
SEM84512050E	12.0	12	20	50	110	11.70

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0 ~ - 0.012	h5
over Ø6	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

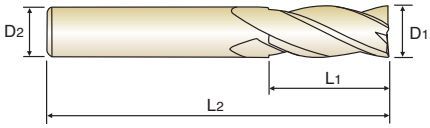
PLAIN SHANK **SEME36 SERIES**

CARBIDE, 4 FLUTE MULTIPLE HELIX

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL
Fraise carbure, 4 dents, hélice multiple
MD, 4 TAGLIENTI, SPIGOLO VIVO

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Multiple Helix for 3.0mm and over 3.0mm diameter end mills minimizing vibration and decreasing wear in cutting.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.



CARBIDE | 4 | 27°/30° | PLAIN | Y Coating

p.C350~C353

D<Ø3, 30˚ HELIX

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME36090E	9.0	10	22	70	-
SEME36095E	9.5	10	24	70	-
SEME36100E	10.0	10	25	75	-
SEME36105E	10.5	12	26	75	-
SEME36110E	11.0	12	30	75	-
SEME36115E	11.5	12	30	80	-
SEME36120E	12.0	12	30	80	-
SEME36130E	13.0	12	35	100	-
SEME3614012SE	14.0	12	35	100	-
SEME3614014SE	14.0	14	35	100	-
SEME36140E	14.0	16	35	100	-
SEME36150E	15.0	16	38	100	-
SEME36160E	16.0	16	40	100	-
SEME36170E	17.0	16	42	100	-
SEME36180E	18.0	16	45	100	-
SEME3618018SE	18.0	18	45	100	-
SEME36190E	19.0	20	45	100	-
SEME36200E	20.0	20	45	100	-
SEME36210E	21.0	20	45	100	-
SEME36220E	22.0	20	45	100	-
SEME36230E	23.0	25	50	120	-
SEME36250E	25.0	25	50	120	-

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

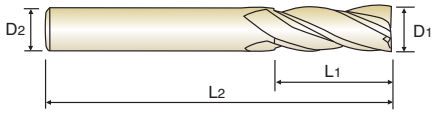
PLAIN SHANK **SEME71** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX (Sharp Corner Removal)

VOLLHARTMETALL, 4 SCHNEIDEN MEHRSPIRAL (Scharfe Schneidenecken entfernt)
Fraise carbure, 4 dents, hélice multiple (Protection de l'angle d'attaque)
MD, 4 TAGLIENTI, TAGLIENTE RINFORZATO

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Multiple Helix for 3.0mm and over 3.0mm diameter endmills minimizing vibration and decreasing wear in cutting.
  - Equal index flutes design for long length and single helix (38°) end mills.
- Gash land geometry applied at the end tooth, achieving heavy duty cutting.
- Available various length products like short, regular and long length end mills etc.
- Available in short, regular and long shank end mills.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeo-metrien hervorragende Schnittleistung und Verschleißfestigkeit
- Ausgezeichnet geeignet für das Fräsen von vorvergütetem Stahl, kohlenstoff Stahl, legiertem Stahl für Formen, bis HRc55 und Maschinenbauteile.
- Aufgrund der Multi-Helix (M-Helix) bei Schaftfräsern ≥ 3,0mm ø werden Vibrationen zuverlässig verhindert und gleichzeitig der Schneidkantenverschleiß verringert.
  -Designed mit gleichgeteilten Spannuten für überlange Schaftfräser.
- Aufgrund der korrigierten Stirnschneiden ist eine Schwerzerspanung möglich.
- Erhältlich in verschiedenen Variationen: kurz, lang und extra lang.



CARBIDE | 4 | 35°/38° | PLAIN | Y Coating

p.C350~C353

D<Ø3, Long Length 38˚ HELIX

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME71025E	2.5	6	7	50	Regular
SEME7102510E	2.5	6	10	50	Long
SEME7102512E	2.5	6	12	50	Long
SEME7103003E	3.0	6	3	40	Short
SEME7103006E	3.0	6	6	40	Short
SEME71030E	3.0	6	8	50	Regular
SEME7103010E	3.0	6	10	50	Long
SEME7103012E	3.0	6	12	50	Long
SEME7103014E	3.0	6	14	50	Long
SEME7104004E	4.0	6	4	40	Short
SEME7104008E	4.0	6	8	40	Short
SEME71040E	4.0	6	10	50	Regular
SEME7104012E	4.0	6	12	50	Long
SEME7104014E	4.0	6	14	50	Long
SEME7104016E	4.0	6	16	50	Long
SEME7105005E	5.0	6	5	50	Short
SEME7105010E	5.0	6	10	50	Short
SEME71050E	5.0	6	15	60	Regular
SEME7105020E	5.0	6	20	60	Long
SEME7105025E	5.0	6	25	60	Long
SEME7106006E	6.0	6	6	50	Short
SEME7106012E	6.0	6	12	50	Short
SEME71060E	6.0	6	15	60	Regular
SEME7106020E	6.0	6	20	60	Long

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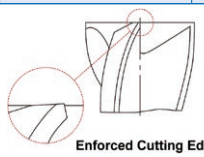
Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

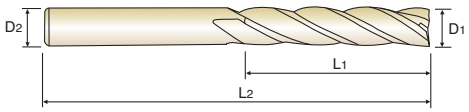
PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN LANG
Fraise carbure, 4 dents, longue
MD, 4 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available in short, regular and long shank end mills.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Erhältlich in verschiebenen Schneiden- und Gesamtlängen.



CARBIDE | 4 | 30° | PLAIN | Y Coating

p.C354~C359

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7201003E	1.0	6	3	60
SEME7201005E	1.0	6	5	60
SEME7201006E	1.0	6	6	60
SEME7201008E	1.0	6	8	60
SEME7201010E	1.0	6	10	60
SEME7201012E	1.0	6	12	60
SEME7201208E	1.2	6	8	60
SEME7201210E	1.2	6	10	60
SEME7201506E	1.5	6	6	60
SEME7201508E	1.5	6	8	60
SEME7201510E	1.5	6	10	60
SEME7201512E	1.5	6	12	60
SEME7201514E	1.5	6	14	60
SEME7201516E	1.5	6	16	60
SEME7202008E	2.0	6	8	60
SEME7202010E	2.0	6	10	60
SEME7202012E	2.0	6	12	60
SEME7202014E	2.0	6	14	60
SEME7202016E	2.0	6	16	60
SEME7202510E	2.5	6	10	60
SEME7202512E	2.5	6	12	60
SEME7202516E	2.5	6	16	60
SEME7202520E	2.5	6	20	60
SEME7202526E	2.5	6	26	60

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

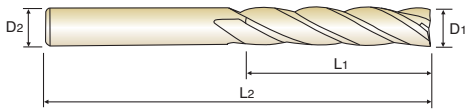
PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN LANG
Fraise carbure, 4 dents, longue
MD, 4 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available in short, regular and long shank end mills.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Erhältlich in verschiebenen Schneiden- und Gesamtlängen.



CARBIDE | 4 | 30° | PLAIN | Y Coating

p.C354~C359

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7206030E	6.0	6	30	80
SEME7206030100E	6.0	6	30	100
SEME7206030150E	6.0	6	30	150
SEME7206035E	6.0	6	35	90
SEME7206040E	6.0	6	40	90
SEME7206040120E	6.0	6	40	120
SEME7206045E	6.0	6	45	150
SEME7208025E	8.0	8	25	80
SEME7208030E	8.0	8	30	80
SEME7208030100E	8.0	8	30	100
SEME7208035E	8.0	8	35	90
SEME7208040E	8.0	8	40	90
SEME7208040120E	8.0	8	40	120
SEME7208040150E	8.0	8	40	150
SEME7208045E	8.0	8	45	100
SEME7208050E	8.0	8	50	100
SEME7208050150E	8.0	8	50	150
SEME7210030E	10.0	10	30	80
SEME7210030100E	10.0	10	30	100
SEME7210035E	10.0	10	35	90
SEME7210040E	10.0	10	40	90
SEME7210040120E	10.0	10	40	120
SEME7210045E	10.0	10	45	100
SEME7210050E	10.0	10	50	100

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

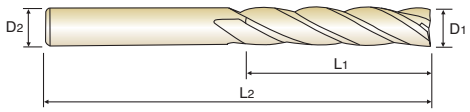
PLAIN SHANK **SEME72 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN LANG
Fraise carbure, 4 dents, longue
MD, 4 TAGLIENTI, SPIGOLO VIVO, SERIE LUNGA

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available in short, regular and long shank end mills.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Erhältlich in verschiebenen Schneiden- und Gesamtlängen.



CARBIDE | 4 | 30° | PLAIN | Y Coating

p.C354~C359

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7216070150E	16.0	16	70	150
SEME7216070200E	16.0	16	70	200
SEME7216080E	16.0	16	80	150
SEME7216090E	16.0	16	90	150
SEME72160110E	16.0	16	110	200
SEME72160120E	16.0	16	120	250
SEME7218070E	18.0	20	70	130
SEME7220050E	20.0	20	50	110
SEME7220050150E	20.0	20	50	150
SEME7220060E	20.0	20	60	130
SEME7220070E	20.0	20	70	130
SEME7220080E	20.0	20	80	150
SEME7220090E	20.0	20	90	150
SEME7220090200E	20.0	20	90	200
SEME72200110E	20.0	20	110	200
SEME72200120E	20.0	20	120	250
SEME7222075E	22.0	20	75	150
SEME72220110E	22.0	20	110	200
SEME7225070E	25.0	25	70	150
SEME7225090E	25.0	25	90	150
SEME72250110E	25.0	25	110	200
SEME72250120E	25.0	25	120	250

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

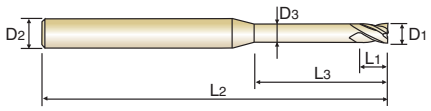
PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 4 dents, détalonnée
MD, 4 TAGLIENTI, SCARICATA, SPIGOLO VIVO

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available in several effective lengths of cut and also overall lengths than previous standard products.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 4 | 30° | PLAIN | Y Coating

p.C360~C365

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7301506E	1.5	4	2.3	6	50	1.45
SEME7301508E	1.5	4	2.3	8	50	1.45
SEME7301510E	1.5	4	2.3	10	50	1.45
SEME7301512E	1.5	4	2.3	12	50	1.45
SEME7301516E	1.5	4	2.3	16	50	1.45
SEME7301518E	1.5	4	2.3	18	50	1.45
SEME7301522E	1.5	4	2.3	22	60	1.45
SEME7301526E	1.5	4	2.3	26	60	1.45
SEME7301530E	1.5	4	2.3	30	70	1.45
SEME7302006E	2.0	4	3	6	50	1.95
SEME7302008E	2.0	4	3	8	50	1.95
SEME7302010E	2.0	4	3	10	50	1.95
SEME7302012E	2.0	4	3	12	50	1.95
SEME7302014E	2.0	4	3	14	50	1.95
SEME7302016E	2.0	4	3	16	50	1.95
SEME7302018E	2.0	4	3	18	50	1.95
SEME7302020E	2.0	4	3	20	50	1.95
SEME7302022E	2.0	4	3	22	60	1.95
SEME7302026E	2.0	4	3	26	60	1.95
SEME7302030E	2.0	4	3	30	70	1.95
SEME7302035E	2.0	4	3	35	70	1.95
SEME7302040E	2.0	4	3	40	80	1.95
SEME7302045E	2.0	4	3	45	90	1.95
SEME7302050E	2.0	4	3	50	100	1.95

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

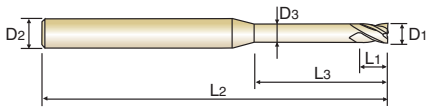
PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN mit ABGESETZTEM SCHAFTTETL
Fraise carbure, 4 dents, détalonnée
MD, 4 TAGLIENTI, SCARICATA, SPIGOLO VIVO

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available in several effective lengths of cut and also overall lengths than previous standard products.

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen. Mehr Auswahlmöglichkeiten als bei den bisherigen standard Produkten.



CARBIDE | 4 | 30° | PLAIN | Y Coating

p.C360~C365

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7303050E	3.0	6	4.5	50	100	2.85
SEME7303060E	3.0	6	4.5	60	100	2.85
SEME7304008E	4.0	6	6	8	50	3.85
SEME7304010E	4.0	6	6	10	50	3.85
SEME7304012E	4.0	6	6	12	50	3.85
SEME7304014E	4.0	6	6	14	60	3.85
SEME7304016E	4.0	6	6	16	60	3.85
SEME7304018E	4.0	6	6	18	60	3.85
SEME7304020E	4.0	6	6	20	60	3.85
SEME7304022E	4.0	6	6	22	65	3.85
SEME7304026E	4.0	6	6	26	65	3.85
SEME7304030E	4.0	6	6	30	70	3.85
SEME7304035E	4.0	6	6	35	70	3.85
SEME7304040E	4.0	6	6	40	80	3.85
SEME7304045E	4.0	6	6	45	90	3.85
SEME7304050E	4.0	6	6	50	100	3.85
SEME7304060E	4.0	6	6	60	100	3.85
SEME7305016E	5.0	6	8	16	60	4.85
SEME7305020E	5.0	6	8	20	60	4.85
SEME7305026E	5.0	6	8	26	65	4.85
SEME7305030E	5.0	6	8	30	70	4.85
SEME7305035E	5.0	6	8	35	75	4.85
SEME7305040E	5.0	6	8	40	80	4.85
SEME7305050E	5.0	6	8	50	90	4.85
SEME7305060E	5.0	6	8	60	100	4.85
SEME7306015E	6.0	6	9	15	60	5.85

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

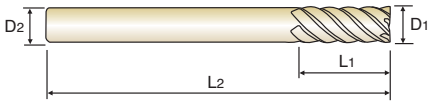
PLAIN SHANK **SEME75** SERIES

CARBIDE, 6 FLUTE 45° HELIX (Regular, Long Shank)

VOLLHARTMETALL, 6 SCHNEIDEN 45° RECHTSSPIRALE
Fraise carbure, 6 dents, hélice 45°
MD, 6 TAGLIENTI, ELICA 45°, SPIGOLO VIVO (Serie media e lunga)

- New coating and tool geometry applied resulting outstanding cutting abilities and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- From the 45 helix angle, better surface roughness can be achieved at side cutting.
- Available in several effective lengths of cut and also overall lengths

- Aufgrund einer neuartigen Beschichtung und neuer Werkzeuggeometrien hervorragende Schnittleistung und Verschleißfestigkeit
- Hervorragende Leistung bei der Zerspanung von vorvergüteten Stählen bis HRc55, welche im Werkzeug- und Formenbau Verwendung finden.
- Aufgrung der 45° Spirale werden bessere Oberlächengüten bei der Eckbearbeitung erreicht
- Erhältlich in verschiedenen gesamt Längen und effektiv Längen.



CARBIDE | 6 | 45° | PLAIN | Y Coating

p.C366~C367

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME7506020E	6.0	6	20	70	Long
SEME7506030E	6.0	6	30	80	Long
SEME75080E	8.0	8	20	70	Regular
SEME7508030E	8.0	8	30	80	Long
SEME7508035E	8.0	8	35	90	Long
SEME7508040E	8.0	8	40	90	Long
SEME7508040130E	8.0	8	40	130	Long
SEME75100E	10.0	10	25	75	Regular
SEME7510030E	10.0	10	30	80	Long
SEME7510040E	10.0	10	40	90	Long
SEME7510050E	10.0	10	50	100	Long
SEME75120E	12.0	12	30	80	Regular
SEME7512040E	12.0	12	40	90	Long
SEME7512050E	12.0	12	50	100	Long
SEME7512060E	12.0	12	60	110	Long
SEME7512060150E	12.0	12	60	150	Long
SEME75160E	16.0	16	40	100	Regular
SEME7516050E	16.0	16	50	110	Long
SEME7516060E	16.0	16	60	120	Long
SEME7516090E	16.0	16	90	150	Long
SEME75160110E	16.0	16	110	200	Long
SEME75160110250E	16.0	16	110	250	Long
SEME75200E	20.0	20	45	100	Regular
SEME7520060E	20.0	20	60	120	Long
SEME7520070E	20.0	20	70	130	Long
SEME75200110E	20.0	20	110	200	Long

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

4G MILL END MILLS

X-SPEED ROUGHER

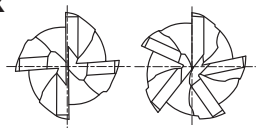
PLAIN SHANK **G9D76** SERIES
FLAT SHANK **G9D68** SERIES

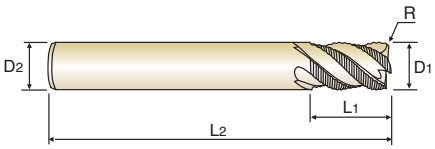
CARBIDE, 4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - LONG LENGTH

VOLLHARTMETALL, 4&5 SCHNEIDEN MEHRSPIRAL Fräser KURZ ECKENRADIUS
Fraise carbure, 4&5 dents, torique, hélice multiple, courte
MD, 4 & 5 TAGLIENTI, TORICA, SERIE CORTA

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.

- einzigartige Nutengeometrie für hervorragenden Spänetransport und Vibrationsreduzierung
- neuartiges Schruppprofil zur reduzierung der Schnittkräfte
- Spezielle Werkzeuggeometrie für Hochvorschub- und Schwerzerspanung geeignet
- speziell entwickelte Schneidengeometrie für Tauch- und Taschenfräsen
- YG-1 eigene Beschichtung um lange lebensdauer und sehr guten Spänetransport zu gewährleisten





CARBIDE | 4&5 | 44°~45° | PLAIN | FLAT | X Coating

p.C368

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
PLAIN	FLAT	R	D1	D2	L1	L2	
G9D76060	**G9D68060**	R0.5	**6.0**	6	12	57	4
G9D76080	**G9D68080**	R0.5	**8.0**	8	16	63	4
G9D76100	**G9D68100**	R0.5	**10.0**	10	20	72	4
G9D76120	**G9D68120**	R0.5	**12.0**	12	24	83	4
G9D76160	**G9D68160**	R1.0	**16.0**	16	32	92	5
G9D76200	**G9D68200**	R1.0	**20.0**	20	40	104	5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.05	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEMD98 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5
P	1-5	Non-alloy steel	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	113	141	187	187
					fz	0.007	0.012	0.015	0.019	0.024	0.029	0.034	0.039	0.044	0.048	0.051	0.054	0.057	0.074
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	29974	29921	29762	23810
					FEED	579	726	891	1149	1436	1754	2041	2328	2646	2872	3057	3231	3393	3524
	6-8	Low alloy steel	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	113	141	187	187
					fz	0.007	0.012	0.015	0.019	0.024	0.029	0.034	0.039	0.044	0.048	0.051	0.054	0.057	0.074
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	29974	29921	29762	23810
					FEED	579	726	891	1149	1436	1754	2041	2328	2646	2872	3057	3231	3393	3524
	9		0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	109	136	180	180
					fz	0.006	0.011	0.014	0.017	0.021	0.025	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.066
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	28913	28860	28648	22918
					FEED	497	665	832	1028	1257	1512	1741	1970	2285	2513	2602	2713	2865	3025
	10-11.1	High alloyed steel, and tool steel	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	113	141	187	187
					fz	0.007	0.012	0.015	0.019	0.024	0.029	0.034	0.039	0.044	0.048	0.051	0.054	0.057	0.074
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	29974	29921	29762	23810
					FEED	579	726	891	1149	1436	1754	2041	2328	2646	2872	3057	3231	3393	3524
	11.2		0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	109	136	180	180
					fz	0.006	0.011	0.014	0.017	0.021	0.025	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.066
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	28913	28860	28648	22918
					FEED	497	665	832	1028	1257	1512	1741	1970	2285	2513	2602	2713	2865	3025
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	113	141	187	187
					fz	0.007	0.012	0.015	0.019	0.024	0.029	0.034	0.039	0.044	0.048	0.051	0.054	0.057	0.074
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	29974	29921	29762	23810
					FEED	579	726	891	1149	1436	1754	2041	2328	2646	2872	3057	3231	3393	3524
H	38.1 - 38.2	Hardened steel	0.08D	0.05D	Vc	10	17	25	34	42	51	59	68	76	85	97	122	151	151
					fz	0.006	0.011	0.013	0.017	0.021	0.024	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.063
					RPM	31831	27056	26526	27056	26738	27056	26829	27056	26880	27056	25730	25889	24032	19226
					FEED	382	595	690	920	1123	1299	1556	1786	2043	2273	2316	2434	2403	2422
	40	Chilled Cast Iron	0.08D	0.05D	Vc	13	19	28	38	47	57	66	75	85	94	109	136	180	180
					fz	0.006	0.011	0.014	0.017	0.021	0.025	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.066
					RPM	41380	30239	29709	30239	29921	30239	30012	29842	30063	29921	28913	28860	28648	22918
					FEED	497	665	832	1028	1257	1512	1741	1970	2285	2513	2602	2713	2865	3025
	41	Hardened Cast Iron	0.08D	0.05D	Vc	10	17	25	34	42	51	59	68	76	85	97	122	151	151
					fz	0.006	0.011	0.013	0.017	0.021	0.024	0.029	0.033	0.038	0.042	0.045	0.047	0.05	0.063
					RPM	31831	27056	26526	27056	26738	27056	26829	27056	26880	27056	25730	25889	24032	19226
					FEED	382	595	690	920	1123	1299	1556	1786	2043	2273	2316	2434	2403	2422

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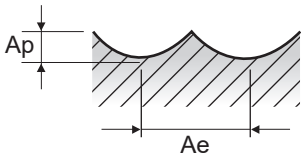

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
			LBS	0.2	0.3	0.5	1	0.5	1	1.5	2	3	1	1.5	2	2.5	3	4	
P	1-5	Non-alloy steel	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	499	499	357	357	357	323	
			Ap	0.009	0.009	0.006	0.002	0.018	0.013	0.007	0.005	0.003	0.019	0.019	0.011	0.007	0.007	0.004	
	6-8	Low alloy steel	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	499	499	357	357	357	323	
			Ap	0.009	0.009	0.006	0.002	0.018	0.013	0.007	0.005	0.003	0.019	0.019	0.011	0.007	0.007	0.004	
	9		Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	399	399	357	357	357	242	
			Ap	0.007	0.007	0.005	0.002	0.014	0.01	0.006	0.004	0.003	0.015	0.015	0.008	0.005	0.005	0.003	
	10-11.1	High alloyed steel, and tool steel	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	499	499	357	357	357	323	
			Ap	0.009	0.009	0.006	0.002	0.018	0.013	0.007	0.005	0.003	0.019	0.019	0.011	0.007	0.007	0.004	
	11.2		Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	399	399	357	357	357	242	
			Ap	0.007	0.007	0.005	0.002	0.014	0.01	0.006	0.004	0.003	0.015	0.015	0.008	0.005	0.005	0.003	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.004	0.004	0.004	0.004	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	499	499	357	357	357	323	
			Ap	0.009	0.009	0.006	0.002	0.018	0.013	0.007	0.005	0.003	0.019	0.019	0.011	0.007	0.007	0.004	
H	38.1 - 38.2	Hardened steel	Vc	16	16	16	14	27	27	24	24	24	40	40	36	36	36	32	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	42972	42972	38197	38197	38197	42441	42441	38197	38197	38197	33953	
			FEED	204	204	204	178	258	258	229	229	229	340	340	306	306	306	204	
			Ap	0.005	0.005	0.004	0.001	0.01	0.007	0.004	0.003	0.002	0.011	0.011	0.006	0.004	0.004	0.002	
	40	Chilled Cast Iron	Vc	16	16	16	14	31	31	28	28	28	47	47	42	42	42	38	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	49338	49338	44563	44563	44563	49869	49869	44563	44563	44563	40319	
			FEED	204	204	204	178	296	296	267	267	267	399	399	357	357	357	242	
			Ap	0.007	0.007	0.005	0.002	0.014	0.01	0.006	0.004	0.003	0.015	0.015	0.008	0.005	0.005	0.003	
	41	Hardened Cast Iron	Vc	16	16	16	14	27	27	24	24	24	40	40	36	36	36	32	
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	
			RPM	50930	50930	50930	44563	42972	42972	38197	38197	38197	42441	42441	38197	38197	38197	33953	
			FEED	204	204	204	178	258	258	229	229	229	340	340	306	306	306	204	
			Ap	0.005	0.005	0.004	0.001	0.01	0.007	0.004	0.003	0.002	0.011	0.011	0.006	0.004	0.004	0.002	

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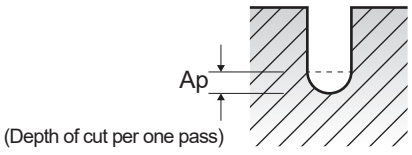

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																
			0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
		LBS	10	12	14	16	1	2	3	4	5	6	8	10	12	14	16	2	4
P	1-5	Vc	32	16	16	5	64	64	64	58	58	58	52	39	39	19	19	75	68
		fz	0.007	0.006	0.006	0.005	0.015	0.015	0.015	0.013	0.013	0.013	0.012	0.01	0.01	0.009	0.009	0.017	0.015
		RPM	20372	10186	10186	3183	33953	33953	33953	30770	30770	30770	27587	20690	20690	10080	10080	34105	30922
		FEED	285	122	122	32	1019	1019	1019	800	800	800	662	414	414	181	181	1160	928
		Ap	0.005	0.005	0.005	0.005	0.038	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025
	6-8	Vc	32	16	16	5	64	64	64	58	58	58	52	39	39	19	19	75	68
		fz	0.007	0.006	0.006	0.005	0.015	0.015	0.015	0.013	0.013	0.013	0.012	0.01	0.01	0.009	0.009	0.017	0.015
		RPM	20372	10186	10186	3183	33953	33953	33953	30770	30770	30770	27587	20690	20690	10080	10080	34105	30922
		FEED	285	122	122	32	1019	1019	1019	800	800	800	662	414	414	181	181	1160	928
		Ap	0.005	0.005	0.005	0.005	0.038	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025
	9	Vc	30	15	15	5	61	61	61	55	55	55	49	37	37	18	18	71	64
		fz	0.006	0.005	0.005	0.005	0.013	0.013	0.013	0.012	0.012	0.012	0.01	0.009	0.009	0.008	0.008	0.014	0.013
		RPM	19099	9549	9549	3183	32362	32362	32362	29178	29178	29178	25995	19629	19629	9549	9549	32286	29103
		FEED	229	95	95	32	841	841	841	700	700	700	520	353	353	153	153	904	757
		Ap	0.004	0.004	0.004	0.004	0.029	0.029	0.029	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02
	10-11.1	Vc	32	16	16	5	64	64	64	58	58	58	52	39	39	19	19	75	68
		fz	0.007	0.006	0.006	0.005	0.015	0.015	0.015	0.013	0.013	0.013	0.012	0.01	0.01	0.009	0.009	0.017	0.015
		RPM	20372	10186	10186	3183	33953	33953	33953	30770	30770	30770	27587	20690	20690	10080	10080	34105	30922
		FEED	285	122	122	32	1019	1019	1019	800	800	800	662	414	414	181	181	1160	928
		Ap	0.005	0.005	0.005	0.005	0.038	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025
	11.2	Vc	30	15	15	5	61	61	61	55	55	55	49	37	37	18	18	71	64
		fz	0.006	0.005	0.005	0.005	0.013	0.013	0.013	0.012	0.012	0.012	0.01	0.009	0.009	0.008	0.008	0.014	0.013
		RPM	19099	9549	9549	3183	32362	32362	32362	29178	29178	29178	25995	19629	19629	9549	9549	32286	29103
		FEED	229	95	95	32	841	841	841	700	700	700	520	353	353	153	153	904	757
		Ap	0.004	0.004	0.004	0.004	0.029	0.029	0.029	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02
K	15-20	Vc	32	16	16	5	64	64	64	58	58	58	52	39	39	19	19	75	68
		fz	0.007	0.006	0.006	0.005	0.015	0.015	0.015	0.013	0.013	0.013	0.012	0.01	0.01	0.009	0.009	0.017	0.015
		RPM	20372	10186	10186	3183	33953	33953	33953	30770	30770	30770	27587	20690	20690	10080	10080	34105	30922
		FEED	285	122	122	32	1019	1019	1019	800	800	800	662	414	414	181	181	1160	928
		Ap	0.005	0.005	0.005	0.005	0.038	0.038	0.038	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025
H	38.1 - 38.2	Vc	27	13	13	4	54	54	54	48	48	48	43	32	32	16	16	63	56
		fz	0.006	0.006	0.006	0.004	0.012	0.012	0.012	0.011	0.011	0.011	0.01	0.008	0.008	0.007	0.007	0.013	0.012
		RPM	17189	8276	8276	2546	28648	28648	28648	25465	25465	25465	22812	16977	16977	8488	8488	28648	25465
		FEED	206	99	99	20	688	688	688	560	560	560	456	272	272	119	119	745	611
		Ap	0.003	0.003	0.003	0.003	0.021	0.021	0.021	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.035	0.014
	40	Vc	30	15	15	5	61	61	61	55	55	55	49	37	37	18	18	71	64
		fz	0.006	0.005	0.005	0.005	0.013	0.013	0.013	0.012	0.012	0.012	0.01	0.009	0.009	0.008	0.008	0.014	0.013
		RPM	19099	9549	9549	3183	32362	32362	32362	29178	29178	29178	25995	19629	19629	9549	9549	32286	29103
		FEED	229	95	95	32	841	841	841	700	700	700	520	353	353	153	153	904	757
		Ap	0.004	0.004	0.004	0.004	0.029	0.029	0.029	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02
	41	Vc	27	13	13	4	54	54	54	48	48	48	43	32	32	16	16	63	56
		fz	0.006	0.006	0.006	0.004	0.012	0.012	0.012	0.011	0.011	0.011	0.01	0.008	0.008	0.007	0.007	0.013	0.012
		RPM	17189	8276	8276	2546	28648	28648	28648	25465	25465	25465	22812	16977	16977	8488	8488	28648	25465
		FEED	206	99	99	20	688	688	688	560	560	560	456	272	272	119	119	745	611
		Ap	0.003	0.003	0.003	0.003	0.021	0.021	0.021	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.035	0.014

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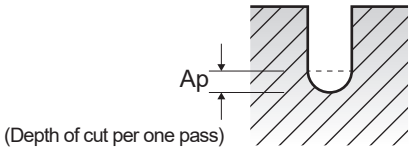

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM846 SERIES 2 FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)															
			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		LBS	3	4	5	6	7	8	10	12	14	16	18	20	22	26	30	40	50
P	1-5	Vc	97	97	97	87	87	87	87	77	77	58	58	58	29	29	29	10	10
		fz	0.025	0.025	0.025	0.022	0.022	0.022	0.022	0.02	0.02	0.017	0.017	0.017	0.015	0.015	0.015	0.012	0.012
		RPM	30876	30876	30876	27693	27693	27693	27693	24510	24510	18462	18462	18462	9231	9231	9231	3183	3183
		FEED	1544	1544	1544	1218	1218	1218	1218	980	980	628	628	628	277	277	277	76	76
		Ap	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009	0.009	0.009	0.009	0.006
	6-8	Vc	97	97	97	87	87	87	87	77	77	58	58	58	29	29	29	10	10
		fz	0.025	0.025	0.025	0.022	0.022	0.022	0.022	0.02	0.02	0.017	0.017	0.017	0.015	0.015	0.015	0.012	0.012
		RPM	30876	30876	30876	27693	27693	27693	27693	24510	24510	18462	18462	18462	9231	9231	9231	3183	3183
		FEED	1544	1544	1544	1218	1218	1218	1218	980	980	628	628	628	277	277	277	76	76
		Ap	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009	0.009	0.009	0.009	0.006
	9	Vc	91	91	91	82	82	82	82	73	73	55	55	55	27	27	27	9	9
		fz	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.018	0.018	0.016	0.016	0.016	0.013	0.013	0.013	0.011	0.011
		RPM	28966	28966	28966	26101	26101	26101	26101	23237	23237	17507	17507	17507	8594	8594	8594	2865	2865
		FEED	1332	1332	1332	1044	1044	1044	1044	837	837	560	560	560	223	223	223	63	63
		Ap	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007	0.007	0.007	0.007	0.005
	10-11.1	Vc	97	97	97	87	87	87	87	77	77	58	58	58	29	29	29	10	10
		fz	0.025	0.025	0.025	0.022	0.022	0.022	0.022	0.02	0.02	0.017	0.017	0.017	0.015	0.015	0.015	0.012	0.012
		RPM	30876	30876	30876	27693	27693	27693	27693	24510	24510	18462	18462	18462	9231	9231	9231	3183	3183
		FEED	1544	1544	1544	1218	1218	1218	1218	980	980	628	628	628	277	277	277	76	76
		Ap	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009	0.009	0.009	0.009	0.006
	11.2	Vc	91	91	91	82	82	82	82	73	73	55	55	55	27	27	27	9	9
		fz	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.018	0.018	0.016	0.016	0.016	0.013	0.013	0.013	0.011	0.011
		RPM	28966	28966	28966	26101	26101	26101	26101	23237	23237	17507	17507	17507	8594	8594	8594	2865	2865
		FEED	1332	1332	1332	1044	1044	1044	1044	837	837	560	560	560	223	223	223	63	63
		Ap	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007	0.007	0.007	0.007	0.005
K	15-20	Vc	97	97	97	87	87	87	87	77	77	58	58	58	29	29	29	10	10
		fz	0.025	0.025	0.025	0.022	0.022	0.022	0.022	0.02	0.02	0.017	0.017	0.017	0.015	0.015	0.015	0.012	0.012
		RPM	30876	30876	30876	27693	27693	27693	27693	24510	24510	18462	18462	18462	9231	9231	9231	3183	3183
		FEED	1544	1544	1544	1218	1218	1218	1218	980	980	628	628	628	277	277	277	76	76
		Ap	0.09	0.063	0.063	0.036	0.036	0.036	0.023	0.023	0.014	0.014	0.009	0.009	0.009	0.009	0.009	0.009	0.006
H	38.1 - 38.2	Vc	81	81	81	73	73	73	73	65	65	48	48	48	24	24	24	8	8
		fz	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.013	0.011	0.011
		RPM	25783	25783	25783	23237	23237	23237	23237	20690	20690	15279	15279	15279	7639	7639	7639	2546	2546
		FEED	1083	1083	1083	883	883	883	883	703	703	458	458	458	199	199	199	56	56
		Ap	0.05	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.008	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.003
	40	Vc	91	91	91	82	82	82	82	73	73	55	55	55	27	27	27	9	9
		fz	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.018	0.018	0.016	0.016	0.016	0.013	0.013	0.013	0.011	0.011
		RPM	28966	28966	28966	26101	26101	26101	26101	23237	23237	17507	17507	17507	8594	8594	8594	2865	2865
		FEED	1332	1332	1332	1044	1044	1044	1044	837	837	560	560	560	223	223	223	63	63
		Ap	0.07	0.049	0.049	0.028	0.028	0.028	0.018	0.018	0.011	0.011	0.007	0.007	0.007	0.007	0.007	0.007	0.005
	41	Vc	81	81	81	73	73	73	73	65	65	48	48	48	24	24	24	8	8
		fz	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.017	0.017	0.015	0.015	0.015	0.013	0.013	0.013	0.011	0.011
		RPM	25783	25783	25783	23237	23237	23237	23237	20690	20690	15279	15279	15279	7639	7639	7639	2546	2546
		FEED	1083	1083	1083	883	883	883	883	703	703	458	458	458	199	199	199	56	56
		Ap	0.05	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.008	0.008	0.005	0.005	0.005	0.005	0.005	0.005	0.003

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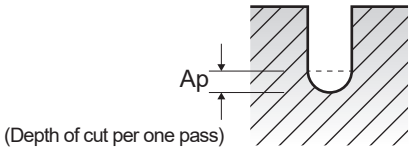

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																
			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.8	1.8
		LBS	16	18	20	22	26	30	35	40	4	6	8	10	12	16	20	4	6
P	1-5	Vc	90	90	90	90	68	68	34	34	112	112	112	100	100	100	89	126	126
		fz	0.026	0.026	0.026	0.026	0.023	0.023	0.02	0.02	0.035	0.035	0.035	0.032	0.032	0.032	0.028	0.04	0.04
		RPM	19099	19099	19099	19099	14430	14430	7215	7215	22282	22282	22282	19894	19894	19894	17706	22282	22282
		FEED	993	993	993	993	664	664	289	289	1560	1560	1560	1273	1273	1273	992	1783	1783
		Ap	0.034	0.034	0.02	0.02	0.014	0.014	0.01	0.01	0.101	0.101	0.101	0.058	0.058	0.036	0.036	0.113	0.113
	6-8	Vc	90	90	90	90	68	68	34	34	112	112	112	100	100	100	89	126	126
		fz	0.026	0.026	0.026	0.026	0.023	0.023	0.02	0.02	0.035	0.035	0.035	0.032	0.032	0.032	0.028	0.04	0.04
		RPM	19099	19099	19099	19099	14430	14430	7215	7215	22282	22282	22282	19894	19894	19894	17706	22282	22282
		FEED	993	993	993	993	664	664	289	289	1560	1560	1560	1273	1273	1273	992	1783	1783
		Ap	0.034	0.034	0.02	0.02	0.014	0.014	0.01	0.01	0.101	0.101	0.101	0.058	0.058	0.036	0.036	0.113	0.113
	9	Vc	85	85	85	85	64	64	32	32	106	106	106	95	95	95	84	119	119
		fz	0.024	0.024	0.024	0.024	0.021	0.021	0.018	0.018	0.031	0.031	0.031	0.028	0.028	0.028	0.025	0.035	0.035
		RPM	18038	18038	18038	18038	13581	13581	6791	6791	21088	21088	21088	18900	18900	18900	16711	21044	21044
		FEED	866	866	866	866	570	570	244	244	1307	1307	1307	1058	1058	1058	836	1473	1473
		Ap	0.026	0.026	0.016	0.016	0.011	0.011	0.008	0.008	0.078	0.078	0.078	0.045	0.045	0.028	0.028	0.088	0.088
	10-11.1	Vc	90	90	90	90	68	68	34	34	112	112	112	100	100	100	89	126	126
		fz	0.026	0.026	0.026	0.026	0.023	0.023	0.02	0.02	0.035	0.035	0.035	0.032	0.032	0.032	0.028	0.04	0.04
		RPM	19099	19099	19099	19099	14430	14430	7215	7215	22282	22282	22282	19894	19894	19894	17706	22282	22282
		FEED	993	993	993	993	664	664	289	289	1560	1560	1560	1273	1273	1273	992	1783	1783
		Ap	0.034	0.034	0.02	0.02	0.014	0.014	0.01	0.01	0.101	0.101	0.101	0.058	0.058	0.036	0.036	0.113	0.113
	11.2	Vc	85	85	85	85	64	64	32	32	106	106	106	95	95	95	84	119	119
		fz	0.024	0.024	0.024	0.024	0.021	0.021	0.018	0.018	0.031	0.031	0.031	0.028	0.028	0.028	0.025	0.035	0.035
		RPM	18038	18038	18038	18038	13581	13581	6791	6791	21088	21088	21088	18900	18900	18900	16711	21044	21044
		FEED	866	866	866	866	570	570	244	244	1307	1307	1307	1058	1058	1058	836	1473	1473
		Ap	0.026	0.026	0.016	0.016	0.011	0.011	0.008	0.008	0.078	0.078	0.078	0.045	0.045	0.028	0.028	0.088	0.088
K	15-20	Vc	90	90	90	90	68	68	34	34	112	112	112	100	100	100	89	126	126
		fz	0.026	0.026	0.026	0.026	0.023	0.023	0.02	0.02	0.035	0.035	0.035	0.032	0.032	0.032	0.028	0.04	0.04
		RPM	19099	19099	19099	19099	14430	14430	7215	7215	22282	22282	22282	19894	19894	19894	17706	22282	22282
		FEED	993	993	993	993	664	664	289	289	1560	1560	1560	1273	1273	1273	992	1783	1783
		Ap	0.034	0.034	0.02	0.02	0.014	0.014	0.01	0.01	0.101	0.101	0.101	0.058	0.058	0.036	0.036	0.113	0.113
H	38.1 - 38.2	Vc	75	75	75	75	57	57	28	28	93	93	93	84	84	84	74	105	105
		fz	0.022	0.022	0.022	0.022	0.019	0.019	0.016	0.016	0.03	0.03	0.03	0.027	0.027	0.027	0.024	0.033	0.033
		RPM	15915	15915	15915	15915	12096	12096	5942	5942	18502	18502	18502	16711	16711	16711	14722	18568	18568
		FEED	700	700	700	700	460	460	190	190	1110	1110	1110	902	902	902	707	1225	1225
		Ap	0.019	0.019	0.011	0.011	0.008	0.008	0.005	0.005	0.056	0.056	0.056	0.032	0.032	0.02	0.02	0.063	0.063
	40	Vc	85	85	85	85	64	64	32	32	106	106	106	95	95	95	84	119	119
		fz	0.024	0.024	0.024	0.024	0.021	0.021	0.018	0.018	0.031	0.031	0.031	0.028	0.028	0.028	0.025	0.035	0.035
		RPM	18038	18038	18038	18038	13581	13581	6791	6791	21088	21088	21088	18900	18900	18900	16711	21044	21044
		FEED	866	866	866	866	570	570	244	244	1307	1307	1307	1058	1058	1058	836	1473	1473
		Ap	0.026	0.026	0.016	0.016	0.011	0.011	0.008	0.008	0.078	0.078	0.078	0.045	0.045	0.028	0.028	0.088	0.088
	41	Vc	75	75	75	75	57	57	28	28	93	93	93	84	84	84	74	105	105
		fz	0.022	0.022	0.022	0.022	0.019	0.019	0.016	0.016	0.03	0.03	0.03	0.027	0.027	0.027	0.024	0.033	0.033
		RPM	15915	15915	15915	15915	12096	12096	5942	5942	18502	18502	18502	16711	16711	16711	14722	18568	18568
		FEED	700	700	700	700	460	460	190	190	1110	1110	1110	902	902	902	707	1225	1225
		Ap	0.019	0.019	0.011	0.011	0.008	0.008	0.005	0.005	0.056	0.056	0.056	0.032	0.032	0.02	0.02	0.063	0.063

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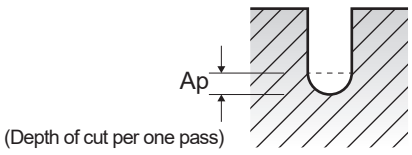

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																
			2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0
		LBS	60	8	10	12	16	20	22	26	30	35	40	45	50	6	8	10	12
P	1-5	Vc	34	124	124	124	112	112	112	99	99	99	74	74	74	129	129	129	129
		fz	0.03	0.061	0.061	0.061	0.055	0.055	0.055	0.049	0.049	0.049	0.043	0.043	0.043	0.075	0.075	0.075	0.075
		RPM	5411	15788	15788	15788	14260	14260	14260	12605	12605	12605	9422	9422	9422	13687	13687	13687	13687
		FEED	325	1926	1926	1926	1569	1569	1569	1235	1235	1235	810	810	810	2053	2053	2053	2053
		Ap	0.018	0.158	0.158	0.158	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189
	6-8	Vc	34	124	124	124	112	112	112	99	99	99	74	74	74	129	129	129	129
		fz	0.03	0.061	0.061	0.061	0.055	0.055	0.055	0.049	0.049	0.049	0.043	0.043	0.043	0.075	0.075	0.075	0.075
		RPM	5411	15788	15788	15788	14260	14260	14260	12605	12605	12605	9422	9422	9422	13687	13687	13687	13687
		FEED	325	1926	1926	1926	1569	1569	1569	1235	1235	1235	810	810	810	2053	2053	2053	2053
		Ap	0.018	0.158	0.158	0.158	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189
	9	Vc	32	117	117	117	105	105	105	94	94	94	70	70	70	122	122	122	122
		fz	0.027	0.054	0.054	0.054	0.048	0.048	0.048	0.043	0.043	0.043	0.038	0.038	0.038	0.067	0.067	0.067	0.067
		RPM	5093	14897	14897	14897	13369	13369	13369	11968	11968	11968	8913	8913	8913	12945	12945	12945	12945
		FEED	275	1609	1609	1609	1283	1283	1283	1029	1029	1029	677	677	677	1735	1735	1735	1735
		Ap	0.014	0.123	0.123	0.123	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147
	10-11.1	Vc	34	124	124	124	112	112	112	99	99	99	74	74	74	129	129	129	129
		fz	0.03	0.061	0.061	0.061	0.055	0.055	0.055	0.049	0.049	0.049	0.043	0.043	0.043	0.075	0.075	0.075	0.075
		RPM	5411	15788	15788	15788	14260	14260	14260	12605	12605	12605	9422	9422	9422	13687	13687	13687	13687
		FEED	325	1926	1926	1926	1569	1569	1569	1235	1235	1235	810	810	810	2053	2053	2053	2053
		Ap	0.018	0.158	0.158	0.158	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189
	11.2	Vc	32	117	117	117	105	105	105	94	94	94	70	70	70	122	122	122	122
		fz	0.027	0.054	0.054	0.054	0.048	0.048	0.048	0.043	0.043	0.043	0.038	0.038	0.038	0.067	0.067	0.067	0.067
		RPM	5093	14897	14897	14897	13369	13369	13369	11968	11968	11968	8913	8913	8913	12945	12945	12945	12945
		FEED	275	1609	1609	1609	1283	1283	1283	1029	1029	1029	677	677	677	1735	1735	1735	1735
		Ap	0.014	0.123	0.123	0.123	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147
K	15-20	Vc	34	124	124	124	112	112	112	99	99	99	74	74	74	129	129	129	129
		fz	0.03	0.061	0.061	0.061	0.055	0.055	0.055	0.049	0.049	0.049	0.043	0.043	0.043	0.075	0.075	0.075	0.075
		RPM	5411	15788	15788	15788	14260	14260	14260	12605	12605	12605	9422	9422	9422	13687	13687	13687	13687
		FEED	325	1926	1926	1926	1569	1569	1569	1235	1235	1235	810	810	810	2053	2053	2053	2053
		Ap	0.018	0.158	0.158	0.158	0.09	0.09	0.056	0.056	0.056	0.034	0.034	0.023	0.023	0.27	0.27	0.189	0.189
H	38.1 - 38.2	Vc	28	104	104	104	93	93	93	83	83	83	62	62	62	107	107	107	107
		fz	0.026	0.049	0.049	0.049	0.044	0.044	0.044	0.04	0.04	0.04	0.035	0.035	0.035	0.063	0.063	0.063	0.063
		RPM	4456	13242	13242	13242	11841	11841	11841	10568	10568	10568	7894	7894	7894	11353	11353	11353	11353
		FEED	232	1298	1298	1298	1042	1042	1042	845	845	845	553	553	553	1430	1430	1430	1430
		Ap	0.01	0.088	0.088	0.088	0.05	0.05	0.031	0.031	0.031	0.019	0.019	0.013	0.013	0.15	0.15	0.105	0.105
	40	Vc	32	117	117	117	105	105	105	94	94	94	70	70	70	122	122	122	122
		fz	0.027	0.054	0.054	0.054	0.048	0.048	0.048	0.043	0.043	0.043	0.038	0.038	0.038	0.067	0.067	0.067	0.067
		RPM	5093	14897	14897	14897	13369	13369	13369	11968	11968	11968	8913	8913	8913	12945	12945	12945	12945
		FEED	275	1609	1609	1609	1283	1283	1283	1029	1029	1029	677	677	677	1735	1735	1735	1735
		Ap	0.014	0.123	0.123	0.123	0.07	0.07	0.044	0.044	0.044	0.026	0.026	0.018	0.018	0.21	0.21	0.147	0.147
	41	Vc	28	104	104	104	93	93	93	83	83	83	62	62	62	107	107	107	107
		fz	0.026	0.049	0.049	0.049	0.044	0.044	0.044	0.04	0.04	0.04	0.035	0.035	0.035	0.063	0.063	0.063	0.063
		RPM	4456	13242	13242	13242	11841	11841	11841	10568	10568	10568	7894	7894	7894	11353	11353	11353	11353
		FEED	232	1298	1298	1298	1042	1042	1042	845	845	845	553	553	553	1430	1430	1430	1430
		Ap	0.01	0.088	0.088	0.088	0.05	0.05	0.031	0.031	0.031	0.019	0.019	0.013	0.013	0.15	0.15	0.105	0.105

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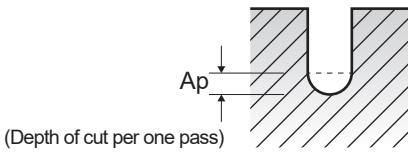

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)										
			4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
		LBS	26	30	35	40	45	50	60	15	20	26	30
P	1-5	Vc	111	111	111	111	99	99	99	121	121	109	109
		fz	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.12	0.12	0.108	0.108
		RPM	8833	8833	8833	8833	7878	7878	7878	7703	7703	6939	6939
		FEED	1590	1590	1590	1590	1261	1261	1261	1849	1849	1499	1499
		Ap	0.144	0.144	0.09	0.09	0.09	0.09	0.054	0.315	0.315	0.18	0.18
	6-8	Vc	111	111	111	111	99	99	99	121	121	109	109
		fz	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.12	0.12	0.108	0.108
		RPM	8833	8833	8833	8833	7878	7878	7878	7703	7703	6939	6939
		FEED	1590	1590	1590	1590	1261	1261	1261	1849	1849	1499	1499
		Ap	0.144	0.144	0.09	0.09	0.09	0.09	0.054	0.315	0.315	0.18	0.18
	9	Vc	105	105	105	105	93	93	93	115	115	103	103
		fz	0.081	0.081	0.081	0.081	0.072	0.072	0.072	0.1	0.1	0.09	0.09
		RPM	8356	8356	8356	8356	7401	7401	7401	7321	7321	6557	6557
		FEED	1354	1354	1354	1354	1066	1066	1066	1464	1464	1180	1180
		Ap	0.112	0.112	0.07	0.07	0.07	0.07	0.042	0.245	0.245	0.14	0.14
	10-11.1	Vc	111	111	111	111	99	99	99	121	121	109	109
		fz	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.12	0.12	0.108	0.108
		RPM	8833	8833	8833	8833	7878	7878	7878	7703	7703	6939	6939
		FEED	1590	1590	1590	1590	1261	1261	1261	1849	1849	1499	1499
		Ap	0.144	0.144	0.09	0.09	0.09	0.09	0.054	0.315	0.315	0.18	0.18
	11.2	Vc	105	105	105	105	93	93	93	115	115	103	103
		fz	0.081	0.081	0.081	0.081	0.072	0.072	0.072	0.1	0.1	0.09	0.09
		RPM	8356	8356	8356	8356	7401	7401	7401	7321	7321	6557	6557
		FEED	1354	1354	1354	1354	1066	1066	1066	1464	1464	1180	1180
		Ap	0.112	0.112	0.07	0.07	0.07	0.07	0.042	0.245	0.245	0.14	0.14
K	15-20	Vc	111	111	111	111	99	99	99	121	121	109	109
		fz	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.12	0.12	0.108	0.108
		RPM	8833	8833	8833	8833	7878	7878	7878	7703	7703	6939	6939
		FEED	1590	1590	1590	1590	1261	1261	1261	1849	1849	1499	1499
		Ap	0.144	0.144	0.09	0.09	0.09	0.09	0.054	0.315	0.315	0.18	0.18
H	38.1 - 38.2	Vc	93	93	93	93	82	82	82	101	101	90	90
		fz	0.077	0.077	0.077	0.077	0.068	0.068	0.068	0.1	0.1	0.09	0.09
		RPM	7401	7401	7401	7401	6525	6525	6525	6430	6430	5730	5730
		FEED	1140	1140	1140	1140	887	887	887	1286	1286	1031	1031
		Ap	0.08	0.08	0.05	0.05	0.05	0.05	0.03	0.175	0.175	0.1	0.1
	40	Vc	105	105	105	105	93	93	93	115	115	103	103
		fz	0.081	0.081	0.081	0.081	0.072	0.072	0.072	0.1	0.1	0.09	0.09
		RPM	8356	8356	8356	8356	7401	7401	7401	7321	7321	6557	6557
		FEED	1354	1354	1354	1354	1066	1066	1066	1464	1464	1180	1180
		Ap	0.112	0.112	0.07	0.07	0.07	0.07	0.042	0.245	0.245	0.14	0.14
	41	Vc	93	93	93	93	82	82	82	101	101	90	90
		fz	0.077	0.077	0.077	0.077	0.068	0.068	0.068	0.1	0.1	0.09	0.09
		RPM	7401	7401	7401	7401	6525	6525	6525	6430	6430	5730	5730
		FEED	1140	1140	1140	1140	887	887	887	1286	1286	1031	1031
		Ap	0.08	0.08	0.05	0.05	0.05	0.05	0.03	0.175	0.175	0.1	0.1

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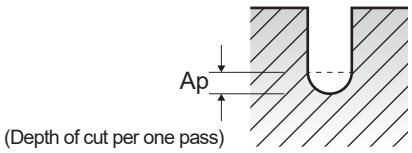

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEMD99 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5
P	1-5	Non-alloy steel	1.0D	0.2D	Vc	28	39	52	57	57	66	75	85	87	93	104
					fz	0.002	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.006
					RPM	44563	41380	41380	36287	30239	30012	29842	30063	27693	24669	22069
					FEED	178	166	166	218	242	240	239	241	222	247	265
	6-8	Low alloy steel	1.0D	0.2D	Vc	28	39	52	57	57	66	75	85	87	93	104
					fz	0.002	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.006
					RPM	44563	41380	41380	36287	30239	30012	29842	30063	27693	24669	22069
					FEED	178	166	166	218	242	240	239	241	222	247	265
	9		1.0D	0.2D	Vc	18	25	34	37	37	44	50	53	57	59	64
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	28648	26526	27056	23555	19629	20008	19894	18745	18144	15650	13581
					FEED	57	53	54	94	79	80	80	75	109	94	109
	10-11.1	High alloyed steel, and tool steel	1.0D	0.2D	Vc	28	39	52	57	57	66	75	85	87	93	104
					fz	0.002	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.006
					RPM	44563	41380	41380	36287	30239	30012	29842	30063	27693	24669	22069
					FEED	178	166	166	218	242	240	239	241	222	247	265
	11.2		1.0D	0.2D	Vc	18	25	34	37	37	44	50	53	57	59	64
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	28648	26526	27056	23555	19629	20008	19894	18745	18144	15650	13581
					FEED	57	53	54	94	79	80	80	75	109	94	109
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.2D	Vc	28	39	52	57	57	66	75	85	87	93	104
					fz	0.002	0.002	0.002	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.006
					RPM	44563	41380	41380	36287	30239	30012	29842	30063	27693	24669	22069
					FEED	178	166	166	218	242	240	239	241	222	247	265
H	38.1 - 38.2	Hardened steel	1.0D	0.2D	Vc	11	16	21	22	23	27	30	33	35	37	40
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	17507	16977	16711	14006	12202	12278	11937	11671	11141	9815	8488
					FEED	35	34	33	56	49	49	48	47	67	59	68
	40	Chilled Cast Iron	1.0D	0.2D	Vc	18	25	34	37	37	44	50	53	57	59	64
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	28648	26526	27056	23555	19629	20008	19894	18745	18144	15650	13581
					FEED	57	53	54	94	79	80	80	75	109	94	109
	41	Hardened Cast Iron	1.0D	0.2D	Vc	11	16	21	22	23	27	30	33	35	37	40
					fz	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004
					RPM	17507	16977	16711	14006	12202	12278	11937	11671	11141	9815	8488
					FEED	35	34	33	56	49	49	48	47	67	59	68

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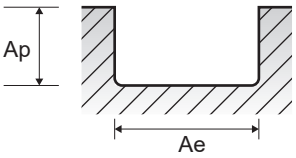

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)											
				0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
			LBS	0.5	1	1.5	2	1	2	3	1	1.5	2	2.5	3
P	1-5	Non-alloy steel	Vc	31	31	28	28	47	42	42	63	63	63	57	57
			fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	49338	49338	44563	44563	49869	44563	44563	50134	50134	50134	45359	45359
			FEED	197	197	178	178	199	178	178	201	201	201	181	181
			Ap	0.04	0.028	0.016	0.01	0.042	0.024	0.015	0.08	0.056	0.056	0.032	0.032
	6-8	Low alloy steel	Vc	31	31	28	28	47	42	42	63	63	63	57	57
			fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	49338	49338	44563	44563	49869	44563	44563	50134	50134	50134	45359	45359
			FEED	197	197	178	178	199	178	178	201	201	201	181	181
			Ap	0.04	0.028	0.016	0.01	0.042	0.024	0.015	0.08	0.056	0.056	0.032	0.032
	9		Vc	22	22	20	20	30	27	27	40	40	40	36	36
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	35014	35014	31831	31831	31831	28648	28648	31831	31831	31831	28648	28648
			FEED	70	70	64	64	64	57	57	64	64	64	57	57
			Ap	0.03	0.021	0.012	0.008	0.032	0.018	0.011	0.06	0.042	0.042	0.024	0.024
	10-11.1	High alloyed steel, and tool steel	Vc	31	31	28	28	47	42	42	63	63	63	57	57
			fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	49338	49338	44563	44563	49869	44563	44563	50134	50134	50134	45359	45359
			FEED	197	197	178	178	199	178	178	201	201	201	181	181
			Ap	0.04	0.028	0.016	0.01	0.042	0.024	0.015	0.08	0.056	0.056	0.032	0.032
	11.2		Vc	22	22	20	20	30	27	27	40	40	40	36	36
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	35014	35014	31831	31831	31831	28648	28648	31831	31831	31831	28648	28648
			FEED	70	70	64	64	64	57	57	64	64	64	57	57
			Ap	0.03	0.021	0.012	0.008	0.032	0.018	0.011	0.06	0.042	0.042	0.024	0.024
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	31	31	28	28	47	42	42	63	63	63	57	57
			fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	49338	49338	44563	44563	49869	44563	44563	50134	50134	50134	45359	45359
			FEED	197	197	178	178	199	178	178	201	201	201	181	181
			Ap	0.04	0.028	0.016	0.01	0.042	0.024	0.015	0.08	0.056	0.056	0.032	0.032
H	38.1 - 38.2	Hardened steel	Vc	13	13	12	12	19	17	17	25	25	25	23	23
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	20690	20690	19099	19099	20160	18038	18038	19894	19894	19894	18303	18303
			FEED	41	41	38	38	40	36	36	40	40	40	37	37
			Ap	0.024	0.017	0.01	0.006	0.025	0.014	0.009	0.048	0.034	0.034	0.019	0.019
	40	Chilled Cast Iron	Vc	22	22	20	20	30	27	27	40	40	40	36	36
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	35014	35014	31831	31831	31831	28648	28648	31831	31831	31831	28648	28648
			FEED	70	70	64	64	64	57	57	64	64	64	57	57
			Ap	0.03	0.021	0.012	0.008	0.032	0.018	0.011	0.06	0.042	0.042	0.024	0.024
	41	Hardened Cast Iron	Vc	13	13	12	12	19	17	17	25	25	25	23	23
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	20690	20690	19099	19099	20160	18038	18038	19894	19894	19894	18303	18303
			FEED	41	41	38	38	40	36	36	40	40	40	37	37
			Ap	0.024	0.017	0.01	0.006	0.025	0.014	0.009	0.048	0.034	0.034	0.019	0.019

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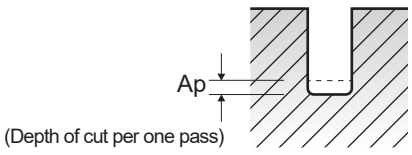

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)													
			0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0
		LBS	4	6	8	10	2	3	4	6	8	10	3	4	6	8	10
P	1-5	Vc	72	72	64	64	91	91	91	82	82	73	104	104	94	94	94
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004
		RPM	32740	32740	29103	29103	36208	36208	36208	32627	32627	29046	33104	33104	29921	29921	29921
		FEED	196	196	175	175	217	217	217	196	196	174	265	265	239	239	239
		Ap	0.056	0.035	0.035	0.021	0.16	0.112	0.112	0.064	0.04	0.04	0.2	0.14	0.08	0.08	0.05
	6-8	Vc	72	72	64	64	91	91	91	82	82	73	104	104	94	94	94
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004
		RPM	32740	32740	29103	29103	36208	36208	36208	32627	32627	29046	33104	33104	29921	29921	29921
		FEED	196	196	175	175	217	217	217	196	196	174	265	265	239	239	239
		Ap	0.056	0.035	0.035	0.021	0.16	0.112	0.112	0.064	0.04	0.04	0.2	0.14	0.08	0.08	0.05
	9	Vc	48	48	42	42	60	60	60	54	54	48	68	68	61	61	61
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	21827	21827	19099	19099	23873	23873	23873	21486	21486	19099	21645	21645	19417	19417	19417
		FEED	87	87	76	76	95	95	95	86	86	76	130	130	78	78	78
		Ap	0.042	0.026	0.026	0.016	0.12	0.084	0.084	0.048	0.03	0.03	0.15	0.105	0.06	0.06	0.038
	10-11.1	Vc	72	72	64	64	91	91	91	82	82	73	104	104	94	94	94
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004
		RPM	32740	32740	29103	29103	36208	36208	36208	32627	32627	29046	33104	33104	29921	29921	29921
		FEED	196	196	175	175	217	217	217	196	196	174	265	265	239	239	239
		Ap	0.056	0.035	0.035	0.021	0.16	0.112	0.112	0.064	0.04	0.04	0.2	0.14	0.08	0.08	0.05
	11.2	Vc	48	48	42	42	60	60	60	54	54	48	68	68	61	61	61
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	21827	21827	19099	19099	23873	23873	23873	21486	21486	19099	21645	21645	19417	19417	19417
		FEED	87	87	76	76	95	95	95	86	86	76	130	130	78	78	78
		Ap	0.042	0.026	0.026	0.016	0.12	0.084	0.084	0.048	0.03	0.03	0.15	0.105	0.06	0.06	0.038
K	15-20	Vc	72	72	64	64	91	91	91	82	82	73	104	104	94	94	94
		fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004
		RPM	32740	32740	29103	29103	36208	36208	36208	32627	32627	29046	33104	33104	29921	29921	29921
		FEED	196	196	175	175	217	217	217	196	196	174	265	265	239	239	239
		Ap	0.056	0.035	0.035	0.021	0.16	0.112	0.112	0.064	0.04	0.04	0.2	0.14	0.08	0.08	0.05
H	38.1 - 38.2	Vc	29	29	26	26	36	36	36	33	33	29	41	41	37	37	37
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	13187	13187	11823	11823	14324	14324	14324	13130	13130	11539	13051	13051	11777	11777	11777
		FEED	53	53	47	47	57	57	57	53	53	46	78	78	47	47	47
		Ap	0.034	0.021	0.021	0.013	0.096	0.067	0.067	0.038	0.024	0.024	0.12	0.084	0.048	0.048	0.03
	40	Vc	48	48	42	42	60	60	60	54	54	48	68	68	61	61	61
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	21827	21827	19099	19099	23873	23873	23873	21486	21486	19099	21645	21645	19417	19417	19417
		FEED	87	87	76	76	95	95	95	86	86	76	130	130	78	78	78
		Ap	0.042	0.026	0.026	0.016	0.12	0.084	0.084	0.048	0.03	0.03	0.15	0.105	0.06	0.06	0.038
	41	Vc	29	29	26	26	36	36	36	33	33	29	41	41	37	37	37
		fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002	0.002
		RPM	13187	13187	11823	11823	14324	14324	14324	13130	13130	11539	13051	13051	11777	11777	11777
		FEED	53	53	47	47	57	57	57	53	53	46	78	78	47	47	47
		Ap	0.034	0.021	0.021	0.013	0.096	0.067	0.067	0.038	0.024	0.024	0.12	0.084	0.048	0.048	0.03

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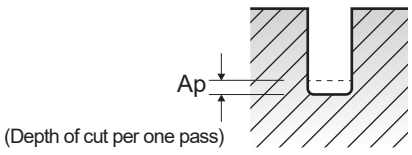

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)														
			1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
		LBS	12	14	16	20	22	26	6	8	10	12	14	16	20	22	26
P	1-5	Vc	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109
		fz	0.005	0.005	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006
		RPM	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348
		FEED	238	238	170	170	170	127	303	303	303	233	233	233	233	208	208
		Ap	0.12	0.075	0.075	0.045	0.045	0.03	0.4	0.28	0.28	0.16	0.16	0.16	0.1	0.1	0.1
	6-8	Vc	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109
		fz	0.005	0.005	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006
		RPM	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348
		FEED	238	238	170	170	170	127	303	303	303	233	233	233	233	208	208
		Ap	0.12	0.075	0.075	0.045	0.045	0.03	0.4	0.28	0.28	0.16	0.16	0.16	0.1	0.1	0.1
	9	Vc	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69
		fz	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004
		RPM	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982
		FEED	117	117	78	78	78	59	138	138	138	124	124	124	124	88	88
		Ap	0.09	0.056	0.056	0.034	0.034	0.023	0.3	0.21	0.21	0.12	0.12	0.12	0.075	0.075	0.075
	10-11.1	Vc	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109
		fz	0.005	0.005	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006
		RPM	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348
		FEED	238	238	170	170	170	127	303	303	303	233	233	233	233	208	208
		Ap	0.12	0.075	0.075	0.045	0.045	0.03	0.4	0.28	0.28	0.16	0.16	0.16	0.1	0.1	0.1
	11.2	Vc	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69
		fz	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004
		RPM	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982
		FEED	117	117	78	78	78	59	138	138	138	124	124	124	124	88	88
		Ap	0.09	0.056	0.056	0.034	0.034	0.023	0.3	0.21	0.21	0.12	0.12	0.12	0.075	0.075	0.075
K	15-20	Vc	112	112	100	100	100	75	136	136	136	122	122	122	122	109	109
		fz	0.005	0.005	0.004	0.004	0.004	0.004	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006
		RPM	23767	23767	21221	21221	21221	15915	21645	21645	21645	19417	19417	19417	19417	17348	17348
		FEED	238	238	170	170	170	127	303	303	303	233	233	233	233	208	208
		Ap	0.12	0.075	0.075	0.045	0.045	0.03	0.4	0.28	0.28	0.16	0.16	0.16	0.1	0.1	0.1
H	38.1 - 38.2	Vc	43	43	38	38	38	29	54	54	54	49	49	49	49	43	43
		fz	0.003	0.003	0.003	0.003	0.003	0.002	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004
		RPM	9125	9125	8064	8064	8064	6154	8594	8594	8594	7799	7799	7799	7799	6844	6844
		FEED	55	55	48	48	48	25	86	86	86	62	62	62	62	55	55
		Ap	0.072	0.045	0.045	0.027	0.027	0.018	0.24	0.168	0.168	0.096	0.096	0.096	0.06	0.06	0.06
	40	Vc	69	69	61	61	61	46	87	87	87	78	78	78	78	69	69
		fz	0.004	0.004	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004
		RPM	14642	14642	12945	12945	12945	9762	13846	13846	13846	12414	12414	12414	12414	10982	10982
		FEED	117	117	78	78	78	59	138	138	138	124	124	124	124	88	88
		Ap	0.09	0.056	0.056	0.034	0.034	0.023	0.3	0.21	0.21	0.12	0.12	0.12	0.075	0.075	0.075
	41	Vc	43	43	38	38	38	29	54	54	54	49	49	49	49	43	43
		fz	0.003	0.003	0.003	0.003	0.003	0.002	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004
		RPM	9125	9125	8064	8064	8064	6154	8594	8594	8594	7799	7799	7799	7799	6844	6844
		FEED	55	55	48	48	48	25	86	86	86	62	62	62	62	55	55
		Ap	0.072	0.045	0.045	0.027	0.027	0.018	0.24	0.168	0.168	0.096	0.096	0.096	0.06	0.06	0.06

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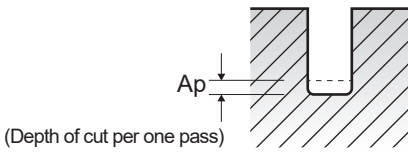

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)											
			3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
		LBS	30	35	40	10	12	14	16	20	26	30	35	45
P	1-5	Vc	135	120	120	161	161	161	161	161	145	145	145	129
		fz	0.009	0.008	0.008	0.016	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.012
		RPM	14324	12732	12732	12812	12812	12812	12812	12812	11539	11539	11539	10265
		FEED	258	204	204	410	410	410	410	410	323	323	323	246
		Ap	0.15	0.15	0.09	0.8	0.8	0.56	0.56	0.56	0.32	0.32	0.2	0.2	0.2
	6-8	Vc	135	120	120	161	161	161	161	161	145	145	145	145	129
		fz	0.009	0.008	0.008	0.016	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012
		RPM	14324	12732	12732	12812	12812	12812	12812	12812	11539	11539	11539	11539	10265
		FEED	258	204	204	410	410	410	410	410	323	323	323	323	246
		Ap	0.15	0.15	0.09	0.8	0.8	0.56	0.56	0.56	0.32	0.32	0.2	0.2	0.2
	9	Vc	87	78	78	103	103	103	103	103	93	93	93	93	82
		fz	0.007	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.01
		RPM	9231	8276	8276	8196	8196	8196	8196	8196	7401	7401	7401	7401	6525
		FEED	129	99	99	197	197	197	197	197	163	163	163	163	131
		Ap	0.113	0.113	0.068	0.6	0.6	0.42	0.42	0.42	0.24	0.24	0.15	0.15	0.15
	10-11.1	Vc	135	120	120	161	161	161	161	161	145	145	145	145	129
		fz	0.009	0.008	0.008	0.016	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012
		RPM	14324	12732	12732	12812	12812	12812	12812	12812	11539	11539	11539	11539	10265
		FEED	258	204	204	410	410	410	410	410	323	323	323	323	246
		Ap	0.15	0.15	0.09	0.8	0.8	0.56	0.56	0.56	0.32	0.32	0.2	0.2	0.2
	11.2	Vc	87	78	78	103	103	103	103	103	93	93	93	93	82
		fz	0.007	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.01
		RPM	9231	8276	8276	8196	8196	8196	8196	8196	7401	7401	7401	7401	6525
		FEED	129	99	99	197	197	197	197	197	163	163	163	163	131
		Ap	0.113	0.113	0.068	0.6	0.6	0.42	0.42	0.42	0.24	0.24	0.15	0.15	0.15
K	15-20	Vc	135	120	120	161	161	161	161	161	145	145	145	145	129
		fz	0.009	0.008	0.008	0.016	0.016	0.016	0.016	0.016	0.014	0.014	0.014	0.014	0.012
		RPM	14324	12732	12732	12812	12812	12812	12812	12812	11539	11539	11539	11539	10265
		FEED	258	204	204	410	410	410	410	410	323	323	323	323	246
		Ap	0.15	0.15	0.09	0.8	0.8	0.56	0.56	0.56	0.32	0.32	0.2	0.2	0.2
H	38.1 - 38.2	Vc	53	48	48	65	65	65	65	65	58	58	58	58	52
		fz	0.006	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.007
		RPM	5623	5093	5093	5173	5173	5173	5173	5173	4615	4615	4615	4615	4138
		FEED	67	51	51	93	93	93	93	93	74	74	74	74	58
		Ap	0.09	0.09	0.054	0.48	0.48	0.336	0.336	0.336	0.192	0.192	0.12	0.12	0.12
	40	Vc	87	78	78	103	103	103	103	103	93	93	93	93	82
		fz	0.007	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.011	0.011	0.011	0.011	0.01
		RPM	9231	8276	8276	8196	8196	8196	8196	8196	7401	7401	7401	7401	6525
		FEED	129	99	99	197	197	197	197	197	163	163	163	163	131
		Ap	0.113	0.113	0.068	0.6	0.6	0.42	0.42	0.42	0.24	0.24	0.15	0.15	0.15
	41	Vc	53	48	48	65	65	65	65	65	58	58	58	58	52
		fz	0.006	0.005	0.005	0.009	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008	0.007
		RPM	5623	5093	5093	5173	5173	5173	5173	5173	4615	4615	4615	4615	4138
		FEED	67	51	51	93	93	93	93	93	74	74	74	74	58
		Ap	0.09	0.09	0.054	0.48	0.48	0.336	0.336	0.336	0.192	0.192	0.12	0.12	0.12

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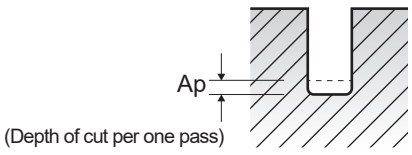

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME01 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0
P	1-5	Non-alloy steel	0.05D	2D	Vc	87	93	104	113	118	125	132	135
					fz	0.003	0.003	0.004	0.004	0.006	0.006	0.008	0.01
					RPM	27693	24669	22069	17985	15024	13263	12005	10743
					FEED	332	296	353	288	361	318	384	430
	6-8	Low alloy steel	0.05D	2D	Vc	87	93	104	113	118	125	132	135
					fz	0.003	0.003	0.004	0.004	0.006	0.006	0.008	0.01
					RPM	27693	24669	22069	17985	15024	13263	12005	10743
					FEED	332	296	353	288	361	318	384	430
	9		0.05D	2D	Vc	57	59	64	73	75	81	85	86
					fz	0.003	0.004	0.004	0.005	0.007	0.008	0.009	0.011
					RPM	18144	15650	13581	11618	9549	8594	7730	6844
					FEED	218	250	217	232	267	275	278	301
	10-11.1	High alloyed steel, and tool steel	0.05D	2D	Vc	87	93	104	113	118	125	132	135
					fz	0.003	0.003	0.004	0.004	0.006	0.006	0.008	0.01
					RPM	27693	24669	22069	17985	15024	13263	12005	10743
					FEED	332	296	353	288	361	318	384	430
	11.2		0.05D	2D	Vc	57	59	64	73	75	81	85	86
					fz	0.003	0.004	0.004	0.005	0.007	0.008	0.009	0.011
					RPM	18144	15650	13581	11618	9549	8594	7730	6844
					FEED	218	250	217	232	267	275	278	301
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2D	Vc	87	93	104	113	118	125	132	135
					fz	0.003	0.003	0.004	0.004	0.006	0.006	0.008	0.01
					RPM	27693	24669	22069	17985	15024	13263	12005	10743
					FEED	332	296	353	288	361	318	384	430
H	38.1 - 38.2	Hardened steel	0.02D	2D	Vc	35	37	40	45	48	50	53	54
					fz	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.008
					RPM	11141	9815	8488	7162	6112	5305	4820	4297
					FEED	134	118	136	143	122	127	135	138
	40	Chilled Cast Iron	0.05D	2D	Vc	57	59	64	73	75	81	85	86
					fz	0.003	0.004	0.004	0.005	0.007	0.008	0.009	0.011
					RPM	18144	15650	13581	11618	9549	8594	7730	6844
					FEED	218	250	217	232	267	275	278	301
	41	Hardened Cast Iron	0.02D	2D	Vc	35	37	40	45	48	50	53	54
					fz	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.008
					RPM	11141	9815	8488	7162	6112	5305	4820	4297
					FEED	134	118	136	143	122	127	135	138

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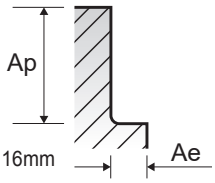

* 1.5XD Axial cutting depth should be for diameter over 16mm

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
			LBS	4	6	8	10	12	16	20	22	26	3	4	6	8	10	12	16
P	1-5	Non-alloy steel	Vc	104	94	94	94	83	62	62	31	31	112	112	112	101	101	101	90
			fz	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM	33104	29921	29921	29921	26420	19735	19735	9868	9868	29709	29709	29709	26791	26791	26791	23873
			FEED	397	239	239	239	211	158	158	79	79	357	357	357	321	321	321	191
			Ae	0.021	0.012	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.036	0.025	0.025	0.014	0.009	0.009	0.005
	6-8	Low alloy steel	Vc	104	94	94	94	83	62	62	31	31	112	112	112	101	101	101	90
			fz	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM	33104	29921	29921	29921	26420	19735	19735	9868	9868	29709	29709	29709	26791	26791	26791	23873
			FEED	397	239	239	239	211	158	158	79	79	357	357	357	321	321	321	191
			Ae	0.021	0.012	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.036	0.025	0.025	0.014	0.009	0.009	0.005
	9		Vc	68	61	61	61	54	41	41	20	20	71	71	71	64	64	64	57
			fz	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.003
			RPM	21645	19417	19417	19417	17189	13051	13051	6366	6366	18833	18833	18833	16977	16977	16977	15120
			FEED	260	233	233	233	138	104	104	51	51	301	301	301	204	204	204	181
			Ae	0.016	0.009	0.009	0.006	0.006	0.003	0.002	0.002	0.002	0.027	0.01	0.019	0.011	0.007	0.007	0.004
	10-11.1	High alloyed steel, and tool steel	Vc	104	94	94	94	83	62	62	31	31	112	112	112	101	101	101	90
			fz	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM	33104	29921	29921	29921	26420	19735	19735	9868	9868	29709	29709	29709	26791	26791	26791	23873
			FEED	397	239	239	239	211	158	158	79	79	357	357	357	321	321	321	191
			Ae	0.021	0.012	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.036	0.025	0.025	0.014	0.009	0.009	0.005
	11.2		Vc	68	61	61	61	54	41	41	20	20	71	71	71	64	64	64	57
			fz	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.003
			RPM	21645	19417	19417	19417	17189	13051	13051	6366	6366	18833	18833	18833	16977	16977	16977	15120
			FEED	260	233	233	233	138	104	104	51	51	301	301	301	204	204	204	181
			Ae	0.016	0.009	0.009	0.006	0.006	0.003	0.002	0.002	0.002	0.027	0.01	0.019	0.011	0.007	0.007	0.004
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	104	94	94	94	83	62	62	31	31	112	112	112	101	101	101	90
			fz	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM	33104	29921	29921	29921	26420	19735	19735	9868	9868	29709	29709	29709	26791	26791	26791	23873
			FEED	397	239	239	239	211	158	158	79	79	357	357	357	321	321	321	191
			Ae	0.021	0.012	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.036	0.025	0.025	0.014	0.009	0.009	0.005
H	38.1 - 38.2	Hardened steel	Vc	41	37	37	37	33	25	25	12	12	44	44	44	40	40	40	35
			fz	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM	13051	11777	11777	11777	10504	7958	7958	3820	3820	11671	11671	11671	10610	10610	10610	9284
			FEED	157	94	94	94	84	64	64	31	31	140	140	140	127	127	127	74
			Ae	0.013	0.007	0.007	0.005	0.005	0.003	0.002	0.002	0.002	0.022	0.015	0.015	0.009	0.005	0.005	0.003
	40	Chilled Cast Iron	Vc	68	61	61	61	54	41	41	20	20	71	71	71	64	64	64	57
			fz	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.004	0.004	0.004	0.003	0.003	0.003	0.003
			RPM	21645	19417	19417	19417	17189	13051	13051	6366	6366	18833	18833	18833	16977	16977	16977	15120
			FEED	260	233	233	233	138	104	104	51	51	301	301	301	204	204	204	181
			Ae	0.016	0.009	0.009	0.006	0.006	0.003	0.002	0.002	0.002	0.027	0.01	0.019	0.011	0.007	0.007	0.004
	41	Hardened Cast Iron	Vc	41	37	37	37	33	25	25	12	12	44	44	44	40	40	40	35
			fz	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.002
			RPM	13051	11777	11777	11777	10504	7958	7958	3820	3820	11671	11671	11671	10610	10610	10610	9284
			FEED	157	94	94	94	84	64	64	31	31	140	140	140	127	127	127	74
			Ae	0.013	0.007	0.007	0.005	0.005	0.003	0.002	0.002	0.002	0.022	0.015	0.015	0.009	0.005	0.005	0.003

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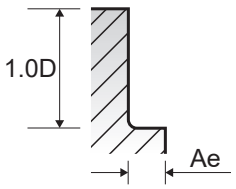

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0
		LBS	10	12	14	16	20	26	30	8	10	12	14	16	20	26	30	35	40	10	12
P	1-5	Vc	141	141	127	127	127	113	113	150	150	150	150	135	135	135	135	120	120	161	161
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.01	0.01
		RPM	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324	14324	12732	12732	12812	12812
		FEED	359	359	323	323	323	230	230	382	382	382	382	344	344	344	344	255	255	512	512
		Ae	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.09	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.014	0.12	0.12
	6-8	Vc	141	141	127	127	127	113	113	150	150	150	150	135	135	135	135	120	120	161	161
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.01	0.01
		RPM	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324	14324	12732	12732	12812	12812
		FEED	359	359	323	323	323	230	230	382	382	382	382	344	344	344	344	255	255	512	512
		Ae	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.09	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.014	0.12	0.12
	9	Vc	90	90	81	81	81	72	72	97	97	97	97	87	87	87	87	78	78	103	103
		fz	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.011	0.011
		RPM	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231	9231	8276	8276	8196	8196
		FEED	321	321	248	248	248	183	183	329	329	329	329	258	258	258	258	199	199	361	361
		Ae	0.039	0.039	0.023	0.023	0.023	0.014	0.014	0.068	0.047	0.047	0.047	0.027	0.027	0.017	0.017	0.017	0.01	0.09	0.09
	10-11.1	Vc	141	141	127	127	127	113	113	150	150	150	150	135	135	135	135	120	120	161	161
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.01	0.01
		RPM	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324	14324	12732	12732	12812	12812
		FEED	359	359	323	323	323	230	230	382	382	382	382	344	344	344	344	255	255	512	512
		Ae	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.09	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.014	0.12	0.12
	11.2	Vc	90	90	81	81	81	72	72	97	97	97	97	87	87	87	87	78	78	103	103
		fz	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.011	0.011
		RPM	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231	9231	8276	8276	8196	8196
		FEED	321	321	248	248	248	183	183	329	329	329	329	258	258	258	258	199	199	361	361
		Ae	0.039	0.039	0.023	0.023	0.023	0.014	0.014	0.068	0.047	0.047	0.047	0.027	0.027	0.017	0.017	0.017	0.01	0.09	0.09
K	15-20	Vc	141	141	127	127	127	113	113	150	150	150	150	135	135	135	135	120	120	161	161
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.01	0.01
		RPM	17953	17953	16170	16170	16170	14388	14388	15915	15915	15915	15915	14324	14324	14324	14324	12732	12732	12812	12812
		FEED	359	359	323	323	323	230	230	382	382	382	382	344	344	344	344	255	255	512	512
		Ae	0.053	0.053	0.03	0.03	0.03	0.019	0.019	0.09	0.063	0.063	0.063	0.036	0.036	0.023	0.023	0.023	0.014	0.12	0.12
H	38.1 - 38.2	Vc	57	57	52	52	52	46	46	59	59	59	59	53	53	53	53	48	48	65	65
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.008	0.008
		RPM	7257	7257	6621	6621	6621	5857	5857	6260	6260	6260	6260	5623	5623	5623	5623	5093	5093	5173	5173
		FEED	145	145	132	132	132	94	94	150	150	150	150	112	112	112	112	102	102	166	166
		Ae	0.032	0.032	0.018	0.018	0.018	0.011	0.011	0.054	0.038	0.038	0.038	0.022	0.022	0.014	0.014	0.014	0.008	0.072	0.072
	40	Vc	90	90	81	81	81	72	72	97	97	97	97	87	87	87	87	78	78	103	103
		fz	0.007	0.007	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.011	0.011
		RPM	11459	11459	10313	10313	10313	9167	9167	10292	10292	10292	10292	9231	9231	9231	9231	8276	8276	8196	8196
		FEED	321	321	248	248	248	183	183	329	329	329	329	258	258	258	258	199	199	361	361
		Ae	0.039	0.039	0.023	0.023	0.023	0.014	0.014	0.068	0.047	0.047	0.047	0.027	0.027	0.017	0.017	0.017	0.01	0.09	0.09
	41	Vc	57	57	52	52	52	46	46	59	59	59	59	53	53	53	53	48	48	65	65
		fz	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.008	0.008
		RPM	7257	7257	6621	6621	6621	5857	5857	6260	6260	6260	6260	5623	5623	5623	5623	5093	5093	5173	5173
		FEED	145	145	132	132	132	94	94	150	150	150	150	112	112	112	112	102	102	166	166
		Ae	0.032	0.032	0.018	0.018	0.018	0.011	0.011	0.054	0.038	0.038	0.038	0.022	0.022	0.014	0.014	0.014	0.008	0.072	0.072

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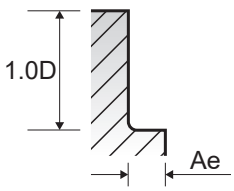

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME35 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
P	1-5	Non-alloy steel	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	13	26	37	49	57	60	62	63	66
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004
					RPM	41380	41380	39258	38993	36287	31831	28193	25067	23343
					FEED	83	83	79	78	145	127	169	150	187
	6-8	Low alloy steel	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	13	26	37	49	57	60	62	63	66
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004
					RPM	41380	41380	39258	38993	36287	31831	28193	25067	23343
					FEED	83	83	79	78	145	127	169	150	187
	9		1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	8	16	22	29	34	36	37	38	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003
					RPM	25465	25465	23343	23077	21645	19099	16825	15120	14147
					FEED	51	51	47	46	87	76	101	91	85
	10 - 11.1	High alloyed steel, and tool steel	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	13	26	37	49	57	60	62	63	66
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004
					RPM	41380	41380	39258	38993	36287	31831	28193	25067	23343
					FEED	83	83	79	78	145	127	169	150	187
	11.2		1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	8	16	22	29	34	36	37	38	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003
					RPM	25465	25465	23343	23077	21645	19099	16825	15120	14147
					FEED	51	51	47	46	87	76	101	91	85
M	14.1	Stainless steel	1.0D	0.5D (up to Ø1: 0.02D)	Vc	7	13	18	25	28	30	31	31	33
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003
					RPM	22282	20690	19099	19894	17825	15915	14097	12335	11671
					FEED	45	41	38	40	71	64	85	74	70
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	13	26	37	49	57	60	62	63	66
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004
					RPM	41380	41380	39258	38993	36287	31831	28193	25067	23343
					FEED	83	83	79	78	145	127	169	150	187
H	38.1 - 38.2	Hardened steel	1.0D	0.05D (up to Ø1: 0.02D)	Vc	5	11	15	20	23	24	25	25	27
					fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002
					RPM	15915	17507	15915	15915	14642	12732	11368	9947	9549
					FEED	16	35	32	32	29	25	23	40	38
	40	Chilled Cast Iron	1.0D	0.05D (up to Ø1: 0.02D)	Vc	8	16	22	29	34	36	37	38	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003
					RPM	25465	25465	23343	23077	21645	19099	16825	15120	14147
					FEED	51	51	47	46	87	76	101	91	85
	41	Hardened Cast Iron	1.0D	0.05D (up to Ø1: 0.02D)	Vc	5	11	15	20	23	24	25	25	27
					fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002
					RPM	15915	17507	15915	15915	14642	12732	11368	9947	9549
					FEED	16	35	32	32	29	25	23	40	38

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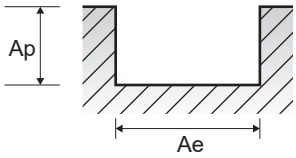

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME35 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)									
					7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0
P	1-5	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	107	106	106	105	104	102	103	104	104	103
				fz	0.043	0.048	0.049	0.05	0.051	0.053	0.053	0.053	0.053	0.054
				RPM	4541	4218	3970	3714	3485	3247	3122	3009	2879	2732
				FEED	391	405	389	371	355	344	331	319	305	295
	6-8	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	107	106	106	105	104	102	103	104	104	103
				fz	0.043	0.048	0.049	0.05	0.051	0.053	0.053	0.053	0.053	0.054
				RPM	4541	4218	3970	3714	3485	3247	3122	3009	2879	2732
				FEED	391	405	389	371	355	344	331	319	305	295
	9	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	64	63	64	64	64	63	63	64	64	63
				fz	0.039	0.042	0.042	0.042	0.042	0.043	0.042	0.041	0.04	0.04
				RPM	2716	2507	2397	2264	2144	2005	1910	1852	1771	1671
				FEED	212	211	201	190	180	172	160	152	142	134
	10 - 11.1	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	107	106	106	105	104	102	103	104	104	103
				fz	0.043	0.048	0.049	0.05	0.051	0.053	0.053	0.053	0.053	0.054
				RPM	4541	4218	3970	3714	3485	3247	3122	3009	2879	2732
				FEED	391	405	389	371	355	344	331	319	305	295
	11.2	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	64	63	64	64	64	63	63	64	64	63
				fz	0.039	0.042	0.042	0.042	0.042	0.043	0.042	0.041	0.04	0.04
				RPM	2716	2507	2397	2264	2144	2005	1910	1852	1771	1671
				FEED	212	211	201	190	180	172	160	152	142	134
M	14.1	1.0D	0.5D (up to Ø1: 0.02D)	Vc	54	53	53	53	53	53	53	53	52	51
				fz	0.042	0.045	0.046	0.048	0.049	0.051	0.05	0.049	0.049	0.05
				RPM	2292	2109	1985	1874	1776	1687	1607	1534	1439	1353
				FEED	193	190	183	180	174	172	161	150	141	135
K	15-20	1.0D	0.5D (up to Ø3: 0.2D) (up to Ø1: 0.15D)	Vc	107	106	106	105	104	102	103	104	104	103
				fz	0.043	0.048	0.049	0.05	0.051	0.053	0.053	0.053	0.053	0.054
				RPM	4541	4218	3970	3714	3485	3247	3122	3009	2879	2732
				FEED	391	405	389	371	355	344	331	319	305	295
H	38.1 - 38.2	1.0D	0.05D (up to Ø1: 0.02D)	Vc	41	42	43	43	43	43	43	44	44	44
				fz	0.021	0.024	0.023	0.022	0.022	0.023	0.023	0.023	0.024	0.025
				RPM	1740	1671	1610	1521	1441	1369	1304	1273	1218	1167
				FEED	73	80	74	67	63	63	60	59	58	58
	40	1.0D	0.05D (up to Ø1: 0.02D)	Vc	64	63	64	64	64	63	63	64	64	63
				fz	0.039	0.042	0.042	0.042	0.042	0.043	0.042	0.041	0.04	0.04
				RPM	2716	2507	2397	2264	2144	2005	1910	1852	1771	1671
				FEED	212	211	201	190	180	172	160	152	142	134
	41	1.0D	0.05D (up to Ø1: 0.02D)	Vc	41	42	43	43	43	43	43	44	44	44
				fz	0.021	0.024	0.023	0.022	0.022	0.023	0.023	0.023	0.024	0.025
				RPM	1740	1671	1610	1521	1441	1369	1304	1273	1218	1167
				FEED	73	80	74	67	63	63	60	59	58	58

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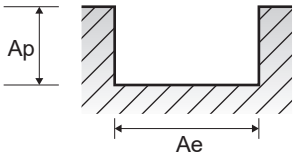

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
					LOC	3	4	5	6	7	8	10	12	4	6	8	10
P	1-5	Non-alloy steel	1.0D	0.3D (up to Ø3:0.4mm)	Vc	50	50	50	45	45	45	45	40	51	51	46	46
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002
					RPM	15915	15915	15915	14324	14324	14324	14324	12732	13528	13528	12202	12202
					FEED	64	64	64	57	57	57	57	51	81	81	49	49
	6-8	Low alloy steel	1.0D	0.3D (up to Ø3:0.4mm)	Vc	50	50	50	45	45	45	45	40	51	51	46	46
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002
					RPM	15915	15915	15915	14324	14324	14324	14324	12732	13528	13528	12202	12202
					FEED	64	64	64	57	57	57	57	51	81	81	49	49
	9		1.0D	0.3D (up to Ø3:0.4mm)	Vc	40	40	40	36	36	36	36	32	41	41	37	37
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	12732	12732	12732	11459	11459	11459	11459	10186	10876	10876	9815	9815
					FEED	51	51	51	46	46	46	46	41	65	65	59	39
	10-11.1	High alloyed steel, and tool steel	1.0D	0.3D (up to Ø3:0.4mm)	Vc	50	50	50	45	45	45	45	40	51	51	46	46
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002
					RPM	15915	15915	15915	14324	14324	14324	14324	12732	13528	13528	12202	12202
					FEED	64	64	64	57	57	57	57	51	81	81	49	49
	11.2		1.0D	0.3D (up to Ø3:0.4mm)	Vc	40	40	40	36	36	36	36	32	41	41	37	37
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	12732	12732	12732	11459	11459	11459	11459	10186	10876	10876	9815	9815
					FEED	51	51	51	46	46	46	46	41	65	65	59	39
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D (up to Ø3:0.4mm)	Vc	50	50	50	45	45	45	45	40	51	51	46	46
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	0.002
					RPM	15915	15915	15915	14324	14324	14324	14324	12732	13528	13528	12202	12202
					FEED	64	64	64	57	57	57	57	51	81	81	49	49
H	38.1 - 38.2	Hardened steel	1.0D	0.05D	Vc	25	25	25	23	23	23	23	20	25	25	23	23
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	7958	7958	7958	7321	7321	7321	7321	6366	6631	6631	6101	6101
					FEED	32	32	32	29	29	15	15	13	27	27	24	24
	40	Chilled Cast Iron	1.0D	0.3D (up to Ø3:0.4mm)	Vc	40	40	40	36	36	36	36	32	41	41	37	37
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	12732	12732	12732	11459	11459	11459	11459	10186	10876	10876	9815	9815
					FEED	51	51	51	46	46	46	46	41	65	65	59	39
	41	Hardened Cast Iron	1.0D	0.05D	Vc	25	25	25	23	23	23	23	20	25	25	23	23
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	7958	7958	7958	7321	7321	7321	7321	6366	6631	6631	6101	6101
					FEED	32	32	32	29	29	15	15	13	27	27	24	24

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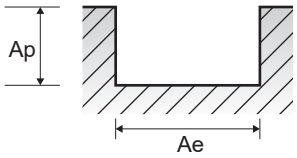

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)														
					3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	6.0
				LOC	16	20	26	30	12	16	20	26	30	20	25	30	35	40	15
P	1-5	1.0D	0.3D (up to Ø3:0.4mm)	Vc	54	54	54	54	65	65	65	58	58	69	69	62	62	62	72
				fz	0.008	0.007	0.006	0.006	0.012	0.012	0.012	0.01	0.01	0.017	0.017	0.015	0.015	0.014	0.024
				RPM	5730	5730	5730	5730	5173	5173	5173	4615	4615	4393	4393	3947	3947	3947	3820
				FEED	92	80	69	69	124	124	124	92	92	149	149	118	118	111	183
	6-8	1.0D	0.3D (up to Ø3:0.4mm)	Vc	54	54	54	54	65	65	65	58	58	69	69	62	62	62	72
				fz	0.008	0.007	0.006	0.006	0.012	0.012	0.012	0.01	0.01	0.017	0.017	0.015	0.015	0.014	0.024
				RPM	5730	5730	5730	5730	5173	5173	5173	4615	4615	4393	4393	3947	3947	3947	3820
				FEED	92	80	69	69	124	124	124	92	92	149	149	118	118	111	183
	9	1.0D	0.3D (up to Ø3:0.4mm)	Vc	44	44	44	44	52	52	52	46	46	55	55	49	49	49	57
				fz	0.008	0.008	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.018	0.018	0.016	0.016	0.014	0.025
				RPM	4669	4669	4669	4669	4138	4138	4138	3661	3661	3501	3501	3119	3119	3119	3024
				FEED	75	75	56	56	99	99	99	88	88	126	126	100	100	87	151
	10-11.1	1.0D	0.3D (up to Ø3:0.4mm)	Vc	54	54	54	54	65	65	65	58	58	69	69	62	62	62	72
				fz	0.008	0.007	0.006	0.006	0.012	0.012	0.012	0.01	0.01	0.017	0.017	0.015	0.015	0.014	0.024
				RPM	5730	5730	5730	5730	5173	5173	5173	4615	4615	4393	4393	3947	3947	3947	3820
				FEED	92	80	69	69	124	124	124	92	92	149	149	118	118	111	183
	11.2	1.0D	0.3D (up to Ø3:0.4mm)	Vc	44	44	44	44	52	52	52	46	46	55	55	49	49	49	57
				fz	0.008	0.008	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.018	0.018	0.016	0.016	0.014	0.025
				RPM	4669	4669	4669	4669	4138	4138	4138	3661	3661	3501	3501	3119	3119	3119	3024
				FEED	75	75	56	56	99	99	99	88	88	126	126	100	100	87	151
K	15-20	1.0D	0.3D (up to Ø3:0.4mm)	Vc	54	54	54	54	65	65	65	58	58	69	69	62	62	62	72
				fz	0.008	0.007	0.006	0.006	0.012	0.012	0.012	0.01	0.01	0.017	0.017	0.015	0.015	0.014	0.024
				RPM	5730	5730	5730	5730	5173	5173	5173	4615	4615	4393	4393	3947	3947	3947	3820
				FEED	92	80	69	69	124	124	124	92	92	149	149	118	118	111	183
H	38.1 - 38.2	1.0D	0.05D	Vc	27	27	27	27	32	32	32	29	29	36	36	32	32	32	37
				fz	0.007	0.006	0.005	0.005	0.01	0.01	0.01	0.009	0.009	0.012	0.012	0.011	0.011	0.01	0.018
				RPM	2865	2865	2865	2865	2546	2546	2546	2308	2308	2292	2292	2037	2037	2037	1963
				FEED	40	34	29	29	51	51	51	42	42	55	55	45	45	41	71
	40	1.0D	0.3D (up to Ø3:0.4mm)	Vc	44	44	44	44	52	52	52	46	46	55	55	49	49	49	57
				fz	0.008	0.008	0.006	0.006	0.012	0.012	0.012	0.012	0.012	0.018	0.018	0.016	0.016	0.014	0.025
				RPM	4669	4669	4669	4669	4138	4138	4138	3661	3661	3501	3501	3119	3119	3119	3024
				FEED	75	75	56	56	99	99	99	88	88	126	126	100	100	87	151
	41	1.0D	0.05D	Vc	27	27	27	27	32	32	32	29	29	36	36	32	32	32	37
				fz	0.007	0.006	0.005	0.005	0.01	0.01	0.01	0.009	0.009	0.012	0.012	0.011	0.011	0.01	0.018
				RPM	2865	2865	2865	2865	2546	2546	2546	2308	2308	2292	2292	2037	2037	2037	1963
				FEED	40	34	29	29	51	51	51	42	42	55	55	45	45	41	71

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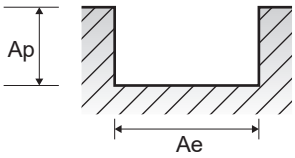

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME70 SERIES 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)													
					12.0	12.0	12.0	12.0	12.0	12.0	12.0	14.0	14.0	16.0	16.0	16.0	16.0	16.0
				LOC	40	45	50	55	60	65	70	50	60	40	50	60	70	80
P	1-5	1.0D	0.3D (up to Ø3:0.4mm)	Vc	75	75	75	75	75	68	68	81	81	85	85	85	85	85
				fz	0.038	0.033	0.033	0.033	0.028	0.028	0.028	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1989	1989	1989	1989	1989	1804	1804	1842	1842	1691	1691	1691	1691	1691
				FEED	151	131	131	131	111	101	101	125	125	139	139	118	118	105
	6-8	1.0D	0.3D (up to Ø3:0.4mm)	Vc	75	75	75	75	75	68	68	81	81	85	85	85	85	85
				fz	0.038	0.033	0.033	0.033	0.028	0.028	0.028	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1989	1989	1989	1989	1989	1804	1804	1842	1842	1691	1691	1691	1691	1691
				FEED	151	131	131	131	111	101	101	125	125	139	139	118	118	105
	9	1.0D	0.3D (up to Ø3:0.4mm)	Vc	63	63	63	63	63	57	57	65	65	64	64	64	64	64
				fz	0.04	0.034	0.034	0.034	0.03	0.03	0.03	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1671	1671	1671	1671	1671	1512	1512	1478	1478	1273	1273	1273	1273	1273
				FEED	134	114	114	114	100	91	91	100	100	104	104	89	89	79
	10-11.1	1.0D	0.3D (up to Ø3:0.4mm)	Vc	75	75	75	75	75	68	68	81	81	85	85	85	85	85
				fz	0.038	0.033	0.033	0.033	0.028	0.028	0.028	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1989	1989	1989	1989	1989	1804	1804	1842	1842	1691	1691	1691	1691	1691
				FEED	151	131	131	131	111	101	101	125	125	139	139	118	118	105
	11.2	1.0D	0.3D (up to Ø3:0.4mm)	Vc	63	63	63	63	63	57	57	65	65	64	64	64	64	64
				fz	0.04	0.034	0.034	0.034	0.03	0.03	0.03	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1671	1671	1671	1671	1671	1512	1512	1478	1478	1273	1273	1273	1273	1273
				FEED	134	114	114	114	100	91	91	100	100	104	104	89	89	79
K	15-20	1.0D	0.3D (up to Ø3:0.4mm)	Vc	75	75	75	75	75	68	68	81	81	85	85	85	85	85
				fz	0.038	0.033	0.033	0.033	0.028	0.028	0.028	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1989	1989	1989	1989	1989	1804	1804	1842	1842	1691	1691	1691	1691	1691
				FEED	151	131	131	131	111	101	101	125	125	139	139	118	118	105
H	38.1 - 38.2	1.0D	0.05D	Vc	38	38	38	38	38	34	34	40	40	40	40	40	40	40
				fz	0.027	0.022	0.022	0.022	0.02	0.019	0.019	0.025	0.025	0.031	0.031	0.025	0.025	0.022
				RPM	1008	1008	1008	1008	1008	902	902	909	909	796	796	796	796	796
				FEED	54	44	44	44	40	34	34	45	45	49	49	40	40	35
	40	1.0D	0.3D (up to Ø3:0.4mm)	Vc	63	63	63	63	63	57	57	65	65	64	64	64	64	64
				fz	0.04	0.034	0.034	0.034	0.03	0.03	0.03	0.034	0.034	0.041	0.041	0.035	0.035	0.031
				RPM	1671	1671	1671	1671	1671	1512	1512	1478	1478	1273	1273	1273	1273	1273
				FEED	134	114	114	114	100	91	91	100	100	104	104	89	89	79
	41	1.0D	0.05D	Vc	38	38	38	38	38	34	34	40	40	40	40	40	40	40
				fz	0.027	0.022	0.022	0.022	0.02	0.019	0.019	0.025	0.025	0.031	0.031	0.025	0.025	0.022
				RPM	1008	1008	1008	1008	1008	902	902	909	909	796	796	796	796	796
				FEED	54	44	44	44	40	34	34	45	45	49	49	40	40	35

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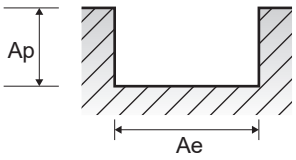

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM845 SERIES — 2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				0.1	0.1	0.1	0.15	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
			LBS	0.3	0.5	1	0.35	0.5	1	1.5	2	1	1.5	2	2.5	3	4	5	1	1.5
P	1-5	Non-alloy steel	Vc	16	16	14	20	24	24	22	22	32	32	29	29	29	26	19	34	34
			fz	0.003	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.01	0.01
			RPM	50930	50930	44563	42441	38197	38197	35014	35014	33953	33953	30770	30770	30770	27587	20160	27056	27056
			FEED	306	306	267	340	382	382	280	280	407	407	308	308	308	276	161	541	541
			Ap	0.009	0.006	0.002	0.013	0.018	0.013	0.007	0.005	0.019	0.019	0.011	0.007	0.007	0.004	0.003	0.036	0.025
	6-8	Low alloy steel	Vc	16	16	14	20	24	24	22	22	32	32	29	29	29	26	19	34	34
			fz	0.003	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.01	0.01
			RPM	50930	50930	44563	42441	38197	38197	35014	35014	33953	33953	30770	30770	30770	27587	20160	27056	27056
			FEED	306	306	267	340	382	382	280	280	407	407	308	308	308	276	161	541	541
			Ap	0.009	0.006	0.002	0.013	0.018	0.013	0.007	0.005	0.019	0.019	0.011	0.007	0.007	0.004	0.003	0.036	0.025
	9		Vc	15	15	13	19	23	23	21	21	30	30	27	27	27	24	18	32	32
			fz	0.002	0.002	0.002	0.003	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.007	0.007
			RPM	47746	47746	41380	40319	36606	36606	33423	33423	31831	31831	28648	28648	28648	25465	19099	25465	25465
			FEED	191	191	166	242	293	293	201	201	255	255	229	229	229	153	115	357	357
			Ap	0.007	0.005	0.002	0.010	0.014	0.01	0.006	0.004	0.015	0.015	0.008	0.005	0.005	0.003	0.002	0.028	0.02
	10-11.1	High alloyed steel, and tool steel	Vc	16	16	14	20	24	24	22	22	32	32	29	29	29	26	19	34	34
			fz	0.003	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.01	0.01
			RPM	50930	50930	44563	42441	38197	38197	35014	35014	33953	33953	30770	30770	30770	27587	20160	27056	27056
			FEED	306	306	267	340	382	382	280	280	407	407	308	308	308	276	161	541	541
			Ap	0.009	0.006	0.002	0.013	0.018	0.013	0.007	0.005	0.019	0.019	0.011	0.007	0.007	0.004	0.003	0.036	0.025
	11.2		Vc	15	15	13	19	23	23	21	21	30	30	27	27	27	24	18	32	32
			fz	0.002	0.002	0.002	0.003	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.007	0.007
			RPM	47746	47746	41380	40319	36606	36606	33423	33423	31831	31831	28648	28648	28648	25465	19099	25465	25465
			FEED	191	191	166	242	293	293	201	201	255	255	229	229	229	153	115	357	357
			Ap	0.007	0.005	0.002	0.010	0.014	0.01	0.006	0.004	0.015	0.015	0.008	0.005	0.005	0.003	0.002	0.028	0.02
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	16	16	14	20	24	24	22	22	32	32	29	29	29	26	19	34	34
			fz	0.003	0.003	0.003	0.004	0.005	0.005	0.004	0.004	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.01	0.01
			RPM	50930	50930	44563	42441	38197	38197	35014	35014	33953	33953	30770	30770	30770	27587	20160	27056	27056
			FEED	306	306	267	340	382	382	280	280	407	407	308	308	308	276	161	541	541
			Ap	0.009	0.006	0.002	0.013	0.018	0.013	0.007	0.005	0.019	0.019	0.011	0.007	0.007	0.004	0.003	0.036	0.025
H	38.1 - 38.2	Hardened steel	Vc	13	13	11	16	20	20	18	18	27	27	24	24	24	21	16	29	29
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.006	0.006
			RPM	41380	41380	35014	33953	31831	31831	28648	28648	28648	28648	25465	25465	25465	22282	16977	23077	23077
			FEED	166	166	140	136	191	191	172	172	229	229	204	204	204	134	102	277	277
			Ap	0.005	0.004	0.001	0.007	0.01	0.007	0.004	0.003	0.011	0.011	0.006	0.004	0.004	0.002	0.002	0.02	0.014
	40	Chilled Cast Iron	Vc	15	15	13	19	23	23	21	21	30	30	27	27	27	24	18	32	32
			fz	0.002	0.002	0.002	0.003	0.004	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.007	0.007
			RPM	47746	47746	41380	40319	36606	36606	33423	33423	31831	31831	28648	28648	28648	25465	19099	25465	25465
			FEED	191	191	166	242	293	293	201	201	255	255	229	229	229	153	115	357	357
			Ap	0.007	0.005	0.002	0.010	0.014	0.01	0.006	0.004	0.015	0.015	0.008	0.005	0.005	0.003	0.002	0.028	0.02
	41	Hardened Cast Iron	Vc	13	13	11	16	20	20	18	18	27	27	24	24	24	21	16	29	29
			fz	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.006	0.006
			RPM	41380	41380	35014	33953	31831	31831	28648	28648	28648	28648	25465	25465	25465	22282	16977	23077	23077
			FEED	166	166	140	136	191	191	172	172	229	229	204	204	204	134	102	277	277
			Ap	0.005	0.004	0.001	0.007	0.01	0.007	0.004	0.003	0.011	0.011	0.006	0.004	0.004	0.002	0.002	0.02	0.014

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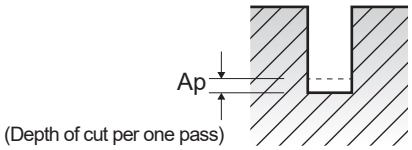

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM845 SERIES — 2 FLUTE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8
		LBS	4	5	6	8	10	12	14	16	2	4	6	8	10	12	2	3	4	5	6
P	1-5	Vc	46	46	46	41	31	31	15	15	60	54	54	48	48	36	69	69	69	62	62
		fz	0.013	0.013	0.013	0.011	0.01	0.01	0.009	0.009	0.014	0.013	0.013	0.011	0.011	0.01	0.014	0.014	0.014	0.013	0.013
		RPM	24404	24404	24404	21751	16446	16446	7958	7958	27284	24555	24555	21827	21827	16370	27454	27454	27454	24669	24669
		FEED	634	634	634	479	329	329	143	143	764	638	638	480	480	327	769	769	769	641	641
		Ap	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029
	6-8	Vc	46	46	46	41	31	31	15	15	60	54	54	48	48	36	69	69	69	62	62
		fz	0.013	0.013	0.013	0.011	0.01	0.01	0.009	0.009	0.014	0.013	0.013	0.011	0.011	0.01	0.014	0.014	0.014	0.013	0.013
		RPM	24404	24404	24404	21751	16446	16446	7958	7958	27284	24555	24555	21827	21827	16370	27454	27454	27454	24669	24669
		FEED	634	634	634	479	329	329	143	143	764	638	638	480	480	327	769	769	769	641	641
		Ap	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029
	9	Vc	44	44	44	39	29	29	15	15	57	51	51	45	45	34	65	65	65	58	58
		fz	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.011	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.011	0.011
		RPM	23343	23343	23343	20690	15385	15385	7958	7958	25920	23191	23191	20463	20463	15461	25863	25863	25863	23077	23077
		FEED	420	420	420	331	215	215	95	95	570	417	417	327	327	216	621	621	621	508	508
		Ap	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022
	10-11.1	Vc	46	46	46	41	31	31	15	15	60	54	54	48	48	36	69	69	69	62	62
		fz	0.013	0.013	0.013	0.011	0.01	0.01	0.009	0.009	0.014	0.013	0.013	0.011	0.011	0.01	0.014	0.014	0.014	0.013	0.013
		RPM	24404	24404	24404	21751	16446	16446	7958	7958	27284	24555	24555	21827	21827	16370	27454	27454	27454	24669	24669
		FEED	634	634	634	479	329	329	143	143	764	638	638	480	480	327	769	769	769	641	641
		Ap	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029
	11.2	Vc	44	44	44	39	29	29	15	15	57	51	51	45	45	34	65	65	65	58	58
		fz	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.011	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.011	0.011
		RPM	23343	23343	23343	20690	15385	15385	7958	7958	25920	23191	23191	20463	20463	15461	25863	25863	25863	23077	23077
		FEED	420	420	420	331	215	215	95	95	570	417	417	327	327	216	621	621	621	508	508
		Ap	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022
K	15-20	Vc	46	46	46	41	31	31	15	15	60	54	54	48	48	36	69	69	69	62	62
		fz	0.013	0.013	0.013	0.011	0.01	0.01	0.009	0.009	0.014	0.013	0.013	0.011	0.011	0.01	0.014	0.014	0.014	0.013	0.013
		RPM	24404	24404	24404	21751	16446	16446	7958	7958	27284	24555	24555	21827	21827	16370	27454	27454	27454	24669	24669
		FEED	634	634	634	479	329	329	143	143	764	638	638	480	480	327	769	769	769	641	641
		Ap	0.022	0.014	0.014	0.008	0.005	0.005	0.005	0.005	0.063	0.025	0.016	0.016	0.009	0.006	0.072	0.05	0.05	0.029	0.029
H	38.1 - 38.2	Vc	39	39	39	34	26	26	13	13	50	45	45	40	40	30	57	57	57	52	52
		fz	0.008	0.008	0.008	0.007	0.006	0.006	0.005	0.005	0.009	0.008	0.008	0.007	0.007	0.006	0.01	0.01	0.01	0.009	0.009
		RPM	20690	20690	20690	18038	13793	13793	6897	6897	22736	20463	20463	18189	18189	13642	22680	22680	22680	20690	20690
		FEED	331	331	331	253	166	166	69	69	409	327	327	255	255	164	454	454	454	372	372
		Ap	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.035	0.014	0.009	0.009	0.005	0.004	0.04	0.028	0.028	0.016	0.016
	40	Vc	44	44	44	39	29	29	15	15	57	51	51	45	45	34	65	65	65	58	58
		fz	0.009	0.009	0.009	0.008	0.007	0.007	0.006	0.006	0.011	0.009	0.009	0.008	0.008	0.007	0.012	0.012	0.012	0.011	0.011
		RPM	23343	23343	23343	20690	15385	15385	7958	7958	25920	23191	23191	20463	20463	15461	25863	25863	25863	23077	23077
		FEED	420	420	420	331	215	215	95	95	570	417	417	327	327	216	621	621	621	508	508
		Ap	0.017	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.049	0.02	0.012	0.012	0.007	0.005	0.056	0.039	0.039	0.022	0.022
	41	Vc	39	39	39	34	26	26	13	13	50	45	45	40	40	30	57	57	57	52	52
		fz	0.008	0.008	0.008	0.007	0.006	0.006	0.005	0.005	0.009	0.008	0.008	0.007	0.007	0.006	0.01	0.01	0.01	0.009	0.009
		RPM	20690	20690	20690	18038	13793	13793	6897	6897	22736	20463	20463	18189	18189	13642	22680	22680	22680	20690	20690
		FEED	331	331	331	253	166	166	69	69	409	327	327	255	255	164	454	454	454	372	372
		Ap	0.012	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.035	0.014	0.009	0.009	0.005	0.004	0.04	0.028	0.028	0.016	0.016

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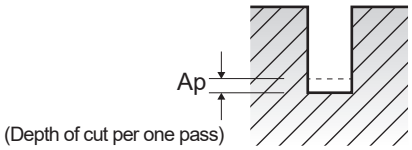

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM845 SERIES — 2 FLUTE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.4	1.4
		LBS	26	30	40	50	4	6	8	10	12	14	16	20	26	30	6	8	10	14	16
P	1-5	Vc	23	23	8	8	83	83	74	74	74	66	66	50	25	25	84	76	76	76	68
		fz	0.013	0.013	0.01	0.01	0.021	0.021	0.019	0.019	0.019	0.017	0.017	0.015	0.013	0.013	0.021	0.019	0.019	0.019	0.017
		RPM	7321	7321	2546	2546	22016	22016	19629	19629	19629	17507	17507	13263	6631	6631	19099	17280	17280	17280	15461
		FEED	190	190	51	51	925	925	746	746	746	595	595	398	172	172	802	657	657	657	526
		Ap	0.009	0.009	0.009	0.006	0.076	0.076	0.043	0.027	0.027	0.027	0.016	0.011	0.011	0.011	0.088	0.05	0.05	0.032	0.032
	6-8	Vc	23	23	8	8	83	83	74	74	74	66	66	50	25	25	84	76	76	76	68
		fz	0.013	0.013	0.01	0.01	0.021	0.021	0.019	0.019	0.019	0.017	0.017	0.015	0.013	0.013	0.021	0.019	0.019	0.019	0.017
		RPM	7321	7321	2546	2546	22016	22016	19629	19629	19629	17507	17507	13263	6631	6631	19099	17280	17280	17280	15461
		FEED	190	190	51	51	925	925	746	746	746	595	595	398	172	172	802	657	657	657	526
		Ap	0.009	0.009	0.009	0.006	0.076	0.076	0.043	0.027	0.027	0.027	0.016	0.011	0.011	0.011	0.088	0.05	0.05	0.032	0.032
	9	Vc	22	22	7	7	78	78	70	70	70	62	62	47	23	23	80	72	72	72	64
		fz	0.011	0.011	0.01	0.01	0.017	0.017	0.016	0.016	0.016	0.014	0.014	0.012	0.01	0.01	0.016	0.014	0.014	0.014	0.013
		RPM	7003	7003	2228	2228	20690	20690	18568	18568	18568	16446	16446	12467	6101	6101	18189	16370	16370	16370	14551
		FEED	154	154	45	45	703	703	594	594	594	460	460	299	122	122	582	458	458	458	378
		Ap	0.007	0.007	0.007	0.005	0.059	0.059	0.034	0.021	0.021	0.021	0.013	0.008	0.008	0.008	0.069	0.039	0.039	0.025	0.025
	10-11.1	Vc	23	23	8	8	83	83	74	74	74	66	66	50	25	25	84	76	76	76	68
		fz	0.013	0.013	0.01	0.01	0.021	0.021	0.019	0.019	0.019	0.017	0.017	0.015	0.013	0.013	0.021	0.019	0.019	0.019	0.017
		RPM	7321	7321	2546	2546	22016	22016	19629	19629	19629	17507	17507	13263	6631	6631	19099	17280	17280	17280	15461
		FEED	190	190	51	51	925	925	746	746	746	595	595	398	172	172	802	657	657	657	526
		Ap	0.009	0.009	0.009	0.006	0.076	0.076	0.043	0.027	0.027	0.027	0.016	0.011	0.011	0.011	0.088	0.05	0.05	0.032	0.032
	11.2	Vc	22	22	7	7	78	78	70	70	70	62	62	47	23	23	80	72	72	72	64
		fz	0.011	0.011	0.01	0.01	0.017	0.017	0.016	0.016	0.016	0.014	0.014	0.012	0.01	0.01	0.016	0.014	0.014	0.014	0.013
		RPM	7003	7003	2228	2228	20690	20690	18568	18568	18568	16446	16446	12467	6101	6101	18189	16370	16370	16370	14551
		FEED	154	154	45	45	703	703	594	594	594	460	460	299	122	122	582	458	458	458	378
		Ap	0.007	0.007	0.007	0.005	0.059	0.059	0.034	0.021	0.021	0.021	0.013	0.008	0.008	0.008	0.069	0.039	0.039	0.025	0.025
K	15-20	Vc	23	23	8	8	83	83	74	74	74	66	66	50	25	25	84	76	76	76	68
		fz	0.013	0.013	0.01	0.01	0.021	0.021	0.019	0.019	0.019	0.017	0.017	0.015	0.013	0.013	0.021	0.019	0.019	0.019	0.017
		RPM	7321	7321	2546	2546	22016	22016	19629	19629	19629	17507	17507	13263	6631	6631	19099	17280	17280	17280	15461
		FEED	190	190	51	51	925	925	746	746	746	595	595	398	172	172	802	657	657	657	526
		Ap	0.009	0.009	0.009	0.006	0.076	0.076	0.043	0.027	0.027	0.027	0.016	0.011	0.011	0.011	0.088	0.05	0.05	0.032	0.032
H	38.1 - 38.2	Vc	19	19	6	6	69	69	62	62	62	55	55	41	21	21	70	63	63	63	56
		fz	0.01	0.01	0.009	0.009	0.013	0.013	0.012	0.012	0.012	0.011	0.011	0.009	0.008	0.008	0.013	0.012	0.012	0.012	0.011
		RPM	6048	6048	1910	1910	18303	18303	16446	16446	16446	14589	14589	10876	5570	5570	15915	14324	14324	14324	12732
		FEED	121	121	34	34	476	476	395	395	395	321	321	196	89	89	414	344	344	344	280
		Ap	0.005	0.005	0.005	0.003	0.042	0.042	0.024	0.015	0.015	0.015	0.009	0.006	0.006	0.006	0.049	0.028	0.028	0.018	0.018
	40	Vc	22	22	7	7	78	78	70	70	70	62	62	47	23	23	80	72	72	72	64
		fz	0.011	0.011	0.01	0.01	0.017	0.017	0.016	0.016	0.016	0.014	0.014	0.012	0.01	0.01	0.016	0.014	0.014	0.014	0.013
		RPM	7003	7003	2228	2228	20690	20690	18568	18568	18568	16446	16446	12467	6101	6101	18189	16370	16370	16370	14551
		FEED	154	154	45	45	703	703	594	594	594	460	460	299	122	122	582	458	458	458	378
		Ap	0.007	0.007	0.007	0.005	0.059	0.059	0.034	0.021	0.021	0.021	0.013	0.008	0.008	0.008	0.069	0.039	0.039	0.025	0.025
	41	Vc	19	19	6	6	69	69	62	62	62	55	55	41	21	21	70	63	63	63	56
		fz	0.01	0.01	0.009	0.009	0.013	0.013	0.012	0.012	0.012	0.011	0.011	0.009	0.008	0.008	0.013	0.012	0.012	0.012	0.011
		RPM	6048	6048	1910	1910	18303	18303	16446	16446	16446	14589	14589	10876	5570	5570	15915	14324	14324	14324	12732
		FEED	121	121	34	34	476	476	395	395	395	321	321	196	89	89	414	344	344	344	280
		Ap	0.005	0.005	0.005	0.003	0.042	0.042	0.024	0.015	0.015	0.015	0.009	0.006	0.006	0.006	0.049	0.028	0.028	0.018	0.018

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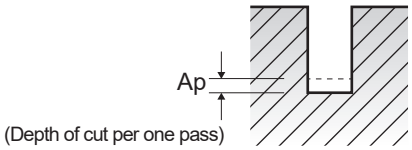

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM845 SERIES — 2 FLUTE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5
		LBS	16	20	6	8	10	12	14	16	18	20	22	26	30	35	40	45	50	60	8
P	1-5	Vc	91	81	90	90	90	81	81	81	81	81	72	72	72	54	54	27	27	27	97
		fz	0.021	0.019	0.028	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.017	0.017	0.017	0.039
		RPM	16092	14324	14324	14324	14324	12892	12892	12892	12892	12892	11459	11459	11459	8594	8594	4297	4297	4297	12350
		FEED	676	544	802	802	802	670	670	670	670	670	527	527	527	344	344	146	146	146	963
		Ap	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018	0.018	0.158
	6-8	Vc	91	81	90	90	90	81	81	81	81	81	72	72	72	54	54	27	27	27	97
		fz	0.021	0.019	0.028	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.017	0.017	0.017	0.039
		RPM	16092	14324	14324	14324	14324	12892	12892	12892	12892	12892	11459	11459	11459	8594	8594	4297	4297	4297	12350
		FEED	676	544	802	802	802	670	670	670	670	670	527	527	527	344	344	146	146	146	963
		Ap	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018	0.018	0.158
	9	Vc	86	76	85	85	85	77	77	77	77	77	68	68	68	51	51	26	26	26	91
		fz	0.018	0.016	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.02	0.018	0.018	0.018	0.016	0.016	0.013	0.013	0.013	0.029
		RPM	15208	13440	13528	13528	13528	12255	12255	12255	12255	12255	10823	10823	10823	8117	8117	4138	4138	4138	11586
		FEED	547	430	622	622	622	490	490	490	490	490	390	390	390	260	260	108	108	108	672
		Ap	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014	0.014	0.123
	10-11.1	Vc	91	81	90	90	90	81	81	81	81	81	72	72	72	54	54	27	27	27	97
		fz	0.021	0.019	0.028	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.017	0.017	0.017	0.039
		RPM	16092	14324	14324	14324	14324	12892	12892	12892	12892	12892	11459	11459	11459	8594	8594	4297	4297	4297	12350
		FEED	676	544	802	802	802	670	670	670	670	670	527	527	527	344	344	146	146	146	963
		Ap	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018	0.018	0.158
	11.2	Vc	86	76	85	85	85	77	77	77	77	77	68	68	68	51	51	26	26	26	91
		fz	0.018	0.016	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.02	0.018	0.018	0.018	0.016	0.016	0.013	0.013	0.013	0.029
		RPM	15208	13440	13528	13528	13528	12255	12255	12255	12255	12255	10823	10823	10823	8117	8117	4138	4138	4138	11586
		FEED	547	430	622	622	622	490	490	490	490	490	390	390	390	260	260	108	108	108	672
		Ap	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014	0.014	0.123
K	15-20	Vc	91	81	90	90	90	81	81	81	81	81	72	72	72	54	54	27	27	27	97
		fz	0.021	0.019	0.028	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.02	0.02	0.017	0.017	0.017	0.039
		RPM	16092	14324	14324	14324	14324	12892	12892	12892	12892	12892	11459	11459	11459	8594	8594	4297	4297	4297	12350
		FEED	676	544	802	802	802	670	670	670	670	670	527	527	527	344	344	146	146	146	963
		Ap	0.041	0.041	0.18	0.126	0.126	0.072	0.072	0.072	0.045	0.045	0.045	0.045	0.027	0.018	0.018	0.018	0.018	0.018	0.158
H	38.1 - 38.2	Vc	75	67	75	75	75	68	68	68	68	68	60	60	60	45	45	23	23	23	81
		fz	0.015	0.013	0.02	0.02	0.02	0.018	0.018	0.018	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.012	0.012	0.012	0.025
		RPM	13263	11848	11937	11937	11937	10823	10823	10823	10823	10823	9549	9549	9549	7162	7162	3661	3661	3661	10313
		FEED	398	308	477	477	477	390	390	390	390	390	306	306	306	201	201	88	88	88	516
		Ap	0.023	0.023	0.1	0.07	0.07	0.04	0.04	0.04	0.025	0.025	0.025	0.025	0.015	0.01	0.01	0.01	0.01	0.01	0.088
	40	Vc	86	76	85	85	85	77	77	77	77	77	68	68	68	51	51	26	26	26	91
		fz	0.018	0.016	0.023	0.023	0.023	0.02	0.02	0.02	0.02	0.02	0.018	0.018	0.018	0.016	0.016	0.013	0.013	0.013	0.029
		RPM	15208	13440	13528	13528	13528	12255	12255	12255	12255	12255	10823	10823	10823	8117	8117	4138	4138	4138	11586
		FEED	547	430	622	622	622	490	490	490	490	490	390	390	390	260	260	108	108	108	672
		Ap	0.032	0.032	0.14	0.098	0.098	0.056	0.056	0.056	0.035	0.035	0.035	0.035	0.021	0.014	0.014	0.014	0.014	0.014	0.123
	41	Vc	75	67	75	75	75	68	68	68	68	68	60	60	60	45	45	23	23	23	81
		fz	0.015	0.013	0.02	0.02	0.02	0.018	0.018	0.018	0.018	0.018	0.016	0.016	0.016	0.014	0.014	0.012	0.012	0.012	0.025
		RPM	13263	11848	11937	11937	11937	10823	10823	10823	10823	10823	9549	9549	9549	7162	7162	3661	3661	3661	10313
		FEED	398	308	477	477	477	390	390	390	390	390	306	306	306	201	201	88	88	88	516
		Ap	0.023	0.023	0.1	0.07	0.07	0.04	0.04	0.04	0.025	0.025	0.025	0.025	0.015	0.01	0.01	0.01	0.01	0.01	0.088

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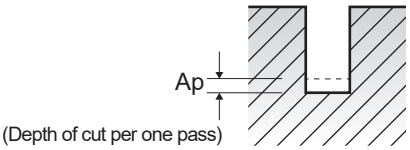

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEM845 SERIES — 2 FLUTE - SLOTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
		LBS	30	35	40	45	50	60	8	10	12	14	16	18	20	22	26	30	35	40	45
P	1-5	Vc	92	82	82	82	62	62	101	101	101	101	101	101	101	90	90	90	90	90	80
		fz	0.035	0.032	0.032	0.032	0.028	0.028	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.073	0.073	0.073	0.073	0.073	0.065
		RPM	9762	8700	8700	8700	6578	6578	8037	8037	8037	8037	8037	8037	8037	7162	7162	7162	7162	7162	6366
		FEED	683	557	557	557	368	368	1302	1302	1302	1302	1302	1302	1302	1046	1046	1046	1046	1046	828
		Ap	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144	0.144	0.144	0.09	0.09	0.09
	6-8	Vc	92	82	82	82	62	62	101	101	101	101	101	101	101	90	90	90	90	90	80
		fz	0.035	0.032	0.032	0.032	0.028	0.028	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.073	0.073	0.073	0.073	0.073	0.065
		RPM	9762	8700	8700	8700	6578	6578	8037	8037	8037	8037	8037	8037	8037	7162	7162	7162	7162	7162	6366
		FEED	683	557	557	557	368	368	1302	1302	1302	1302	1302	1302	1302	1046	1046	1046	1046	1046	828
		Ap	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144	0.144	0.144	0.09	0.09	0.09
	9	Vc	87	78	78	78	58	58	96	96	96	96	96	96	96	86	86	86	86	86	76
		fz	0.026	0.023	0.023	0.023	0.021	0.021	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.069	0.069	0.069	0.069	0.069	0.061
		RPM	9231	8276	8276	8276	6154	6154	7639	7639	7639	7639	7639	7639	7639	6844	6844	6844	6844	6844	6048
		FEED	480	381	381	381	258	258	1161	1161	1161	1161	1161	1161	1161	944	944	944	944	944	738
		Ap	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112	0.112	0.112	0.07	0.07	0.07
	10-11.1	Vc	92	82	82	82	62	62	101	101	101	101	101	101	101	90	90	90	90	90	80
		fz	0.035	0.032	0.032	0.032	0.028	0.028	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.073	0.073	0.073	0.073	0.073	0.065
		RPM	9762	8700	8700	8700	6578	6578	8037	8037	8037	8037	8037	8037	8037	7162	7162	7162	7162	7162	6366
		FEED	683	557	557	557	368	368	1302	1302	1302	1302	1302	1302	1302	1046	1046	1046	1046	1046	828
		Ap	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144	0.144	0.144	0.09	0.09	0.09
	11.2	Vc	87	78	78	78	58	58	96	96	96	96	96	96	96	86	86	86	86	86	76
		fz	0.026	0.023	0.023	0.023	0.021	0.021	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.069	0.069	0.069	0.069	0.069	0.061
		RPM	9231	8276	8276	8276	6154	6154	7639	7639	7639	7639	7639	7639	7639	6844	6844	6844	6844	6844	6048
		FEED	480	381	381	381	258	258	1161	1161	1161	1161	1161	1161	1161	944	944	944	944	944	738
		Ap	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112	0.112	0.112	0.07	0.07	0.07
K	15-20	Vc	92	82	82	82	62	62	101	101	101	101	101	101	101	90	90	90	90	90	80
		fz	0.035	0.032	0.032	0.032	0.028	0.028	0.081	0.081	0.081	0.081	0.081	0.081	0.081	0.073	0.073	0.073	0.073	0.073	0.065
		RPM	9762	8700	8700	8700	6578	6578	8037	8037	8037	8037	8037	8037	8037	7162	7162	7162	7162	7162	6366
		FEED	683	557	557	557	368	368	1302	1302	1302	1302	1302	1302	1302	1046	1046	1046	1046	1046	828
		Ap	0.068	0.068	0.041	0.041	0.027	0.027	0.36	0.36	0.36	0.252	0.252	0.252	0.252	0.144	0.144	0.144	0.09	0.09	0.09
H	38.1 - 38.2	Vc	56	50	50	50	37	37	84	84	84	84	84	84	84	76	76	76	76	76	67
		fz	0.031	0.027	0.027	0.027	0.024	0.024	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.052	0.052	0.052	0.052	0.052	0.046
		RPM	5942	5305	5305	5305	3926	3926	6685	6685	6685	6685	6685	6685	6685	6048	6048	6048	6048	6048	5332
		FEED	368	286	286	286	188	188	762	762	762	762	762	762	762	629	629	629	629	629	491
		Ap	0.038	0.038	0.023	0.023	0.015	0.015	0.2	0.2	0.2	0.14	0.14	0.14	0.14	0.08	0.08	0.08	0.05	0.05	0.05
	40	Vc	87	78	78	78	58	58	96	96	96	96	96	96	96	86	86	86	86	86	76
		fz	0.026	0.023	0.023	0.023	0.021	0.021	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.069	0.069	0.069	0.069	0.069	0.061
		RPM	9231	8276	8276	8276	6154	6154	7639	7639	7639	7639	7639	7639	7639	6844	6844	6844	6844	6844	6048
		FEED	480	381	381	381	258	258	1161	1161	1161	1161	1161	1161	1161	944	944	944	944	944	738
		Ap	0.053	0.053	0.032	0.032	0.021	0.021	0.28	0.28	0.28	0.196	0.196	0.196	0.196	0.112	0.112	0.112	0.07	0.07	0.07
	41	Vc	56	50	50	50	37	37	84	84	84	84	84	84	84	76	76	76	76	76	67
		fz	0.031	0.027	0.027	0.027	0.024	0.024	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.052	0.052	0.052	0.052	0.052	0.046
		RPM	5942	5305	5305	5305	3926	3926	6685	6685	6685	6685	6685	6685	6685	6048	6048	6048	6048	6048	5332
		FEED	368	286	286	286	188	188	762	762	762	762	762	762	762	629	629	629	629	629	491
		Ap	0.038	0.038	0.023	0.023	0.015	0.015	0.2	0.2	0.2	0.14	0.14	0.14	0.14	0.08	0.08	0.08	0.05	0.05	0.05

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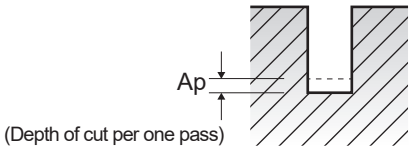

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME36, SEME71 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.8	0.9	1.0	1.2	1.5	2.0	2.5	3.0
P	1-5	Non-alloy steel	0.05D	1.0D	Vc	79	83	84	85	88	91	101	105
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	31433	29355	26738	22547	18674	14483	12860	11141
					FEED	251	235	214	271	299	290	309	357
	6-8	Low alloy steel	0.05D	1.0D	Vc	79	83	84	85	88	91	101	105
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	31433	29355	26738	22547	18674	14483	12860	11141
					FEED	251	235	214	271	299	290	309	357
	9		0.05D	1.0D	Vc	47	50	51	51	53	59	64	66
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	18701	17684	16234	13528	11247	9390	8149	7003
					FEED	150	141	130	162	180	188	196	224
	10-11.1	High alloyed steel, and tool steel	0.05D	1.0D	Vc	79	83	84	85	88	91	101	105
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	31433	29355	26738	22547	18674	14483	12860	11141
					FEED	251	235	214	271	299	290	309	357
	11.2		0.05D	1.0D	Vc	47	50	51	51	53	59	64	66
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	18701	17684	16234	13528	11247	9390	8149	7003
					FEED	150	141	130	162	180	188	196	224
M	14.1	Stainless steel	0.05D	1.0D	Vc	39	41	42	42	44	50	54	54
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	15518	14501	13369	11141	9337	7958	6875	5730
					FEED	124	116	107	134	149	159	165	183
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	Vc	79	83	84	85	88	91	101	105
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	31433	29355	26738	22547	18674	14483	12860	11141
					FEED	251	235	214	271	299	290	309	357
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	31	33	34	34	35	40	41	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.004
					RPM	12335	11671	10823	9019	7427	6366	5220	4244
					FEED	49	47	43	36	59	51	63	68
	40	Chilled Cast Iron	0.05D	1.0D	Vc	47	50	51	51	53	59	64	66
					fz	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.008
					RPM	18701	17684	16234	13528	11247	9390	8149	7003
					FEED	150	141	130	162	180	188	196	224
	41	Hardened Cast Iron	0.05D	1.0D	Vc	31	33	34	34	35	40	41	40
					fz	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.004
					RPM	12335	11671	10823	9019	7427	6366	5220	4244
					FEED	49	47	43	36	59	51	63	68

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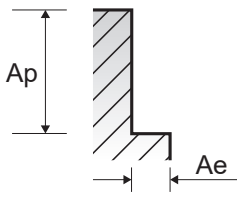

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME36, SEME71 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)							
					9.5	10.0	10.5	11.0	11.5	12.0	13.0	14.0
P	1-5	0.05D	1.0D	Vc	130	128	129	130	130	129	133	136
				fz	0.038	0.039	0.04	0.04	0.04	0.04	0.04	0.04
				RPM	4356	4074	3911	3762	3598	3422	3257	3092
				FEED	662	636	626	602	576	547	521	495
	6-8	0.05D	1.0D	Vc	130	128	129	130	130	129	133	136
				fz	0.038	0.039	0.04	0.04	0.04	0.04	0.04	0.04
				RPM	4356	4074	3911	3762	3598	3422	3257	3092
				FEED	662	636	626	602	576	547	521	495
	9	0.05D	1.0D	Vc	79	79	79	79	79	79	82	84
				fz	0.031	0.032	0.032	0.032	0.032	0.032	0.031	0.031
				RPM	2647	2515	2395	2286	2187	2096	2008	1910
				FEED	328	322	307	293	280	268	249	237
	10-11.1	0.05D	1.0D	Vc	130	128	129	130	130	129	133	136
				fz	0.038	0.039	0.04	0.04	0.04	0.04	0.04	0.04
				RPM	4356	4074	3911	3762	3598	3422	3257	3092
				FEED	662	636	626	602	576	547	521	495
	11.2	0.05D	1.0D	Vc	79	79	79	79	79	79	82	84
				fz	0.031	0.032	0.032	0.032	0.032	0.032	0.031	0.031
				RPM	2647	2515	2395	2286	2187	2096	2008	1910
				FEED	328	322	307	293	280	268	249	237
M	14.1	0.05D	1.0D	Vc	67	66	66	66	65	64	66	68
				fz	0.037	0.038	0.038	0.038	0.038	0.037	0.037	0.037
				RPM	2245	2101	2001	1910	1799	1698	1616	1546
				FEED	332	319	304	290	273	251	239	229
K	15-20	0.05D	1.0D	Vc	130	128	129	130	130	129	133	136
				fz	0.038	0.039	0.04	0.04	0.04	0.04	0.04	0.04
				RPM	4356	4074	3911	3762	3598	3422	3257	3092
				FEED	662	636	626	602	576	547	521	495
H	38.1 - 38.2	0.05D	1.0D	Vc	54	53	54	55	55	55	56	57
				fz	0.014	0.014	0.014	0.014	0.015	0.015	0.015	0.015
				RPM	1809	1687	1637	1592	1522	1459	1371	1296
				FEED	101	94	92	89	91	88	82	78
	40	0.05D	1.0D	Vc	79	79	79	79	79	79	82	84
				fz	0.031	0.032	0.032	0.032	0.032	0.032	0.031	0.031
				RPM	2647	2515	2395	2286	2187	2096	2008	1910
				FEED	328	322	307	293	280	268	249	237
	41	0.05D	1.0D	Vc	54	53	54	55	55	55	56	57
				fz	0.014	0.014	0.014	0.014	0.015	0.015	0.015	0.015
				RPM	1809	1687	1637	1592	1522	1459	1371	1296
				FEED	101	94	92	89	91	88	82	78

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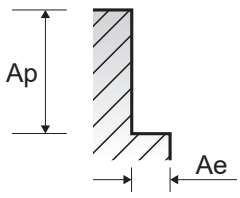

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME72 SERIES — **4 FLUTE - SIDE CUTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
					LOC	3	4	5	6	7	8	10	12	4	6	8	10
P	1-5	Non-alloy steel	0.05D	2.5D	Vc	60	60	60	54	54	54	54	48	61	61	55	55
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	19099	19099	19099	17189	17189	17189	17189	15279	16181	16181	14589	14589
					FEED	153	153	153	138	138	138	138	122	194	194	175	117
	6-8	Low alloy steel	0.05D	2.5D	Vc	60	60	60	54	54	54	54	48	61	61	55	55
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	19099	19099	19099	17189	17189	17189	17189	15279	16181	16181	14589	14589
					FEED	153	153	153	138	138	138	138	122	194	194	175	117
	9		0.05D	2.5D	Vc	34	34	34	31	31	31	31	28	35	35	31	31
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	10823	10823	10823	9868	9868	9868	9868	8913	9284	9284	8223	8223
					FEED	87	87	87	79	79	39	39	36	74	74	66	66
	10-11.1	High alloyed steel, and tool steel	0.05D	2.5D	Vc	60	60	60	54	54	54	54	48	61	61	55	55
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	19099	19099	19099	17189	17189	17189	17189	15279	16181	16181	14589	14589
					FEED	153	153	153	138	138	138	138	122	194	194	175	117
	11.2		0.05D	2.5D	Vc	34	34	34	31	31	31	31	28	35	35	31	31
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	10823	10823	10823	9868	9868	9868	9868	8913	9284	9284	8223	8223
					FEED	87	87	87	79	79	39	39	36	74	74	66	66
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	Vc	60	60	60	54	54	54	54	48	61	61	55	55
					fz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.002
					RPM	19099	19099	19099	17189	17189	17189	17189	15279	16181	16181	14589	14589
					FEED	153	153	153	138	138	138	138	122	194	194	175	117
H	38.1 - 38.2	Hardened steel	0.02D	2.0D	Vc	21	21	21	19	19	19	19	17	21	21	19	19
					fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001
					RPM	6685	6685	6685	6048	6048	6048	6048	5411	5570	5570	5040	5040
					FEED	27	27	27	24	24	24	24	22	45	45	40	20
	40	Chilled Cast Iron	0.05D	2.5D	Vc	34	34	34	31	31	31	31	28	35	35	31	31
					fz	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002
					RPM	10823	10823	10823	9868	9868	9868	9868	8913	9284	9284	8223	8223
					FEED	87	87	87	79	79	39	39	36	74	74	66	66
	41	Hardened Cast Iron	0.02D	2.0D	Vc	21	21	21	19	19	19	19	17	21	21	19	19
					fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001
					RPM	6685	6685	6685	6048	6048	6048	6048	5411	5570	5570	5040	5040
					FEED	27	27	27	24	24	24	24	22	45	45	40	20

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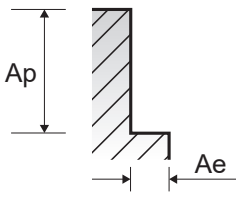

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME72 SERIES — **4 FLUTE - SIDE CUTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)														
					3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0
				LOC	14	16	20	26	30	12	16	20	26	30	20	25	30	35	40
P	1-5	0.05D	2.5D	Vc	70	63	63	63	63	75	75	75	68	68	80	80	72	72	72
				fz	0.009	0.009	0.008	0.008	0.008	0.014	0.014	0.014	0.013	0.013	0.021	0.021	0.019	0.019	0.017
				RPM	7427	6685	6685	6685	6685	5968	5968	5968	5411	5411	5093	5093	4584	4584	4584
				FEED	267	241	214	214	214	334	334	334	281	281	428	428	348	348	312
	6-8	0.05D	2.5D	Vc	70	63	63	63	63	75	75	75	68	68	80	80	72	72	72
				fz	0.009	0.009	0.008	0.008	0.008	0.014	0.014	0.014	0.013	0.013	0.021	0.021	0.019	0.019	0.017
				RPM	7427	6685	6685	6685	6685	5968	5968	5968	5411	5411	5093	5093	4584	4584	4584
				FEED	267	241	214	214	214	334	334	334	281	281	428	428	348	348	312
	9	0.05D	2.5D	Vc	40	36	36	36	36	43	43	43	39	39	46	46	41	41	41
				fz	0.007	0.007	0.006	0.006	0.006	0.01	0.01	0.01	0.009	0.009	0.015	0.015	0.013	0.013	0.011
				RPM	4244	3820	3820	3820	3820	3422	3422	3422	3104	3104	2928	2928	2610	2610	2610
				FEED	119	107	92	92	92	137	137	137	112	112	176	176	136	136	115
	10-11.1	0.05D	2.5D	Vc	70	63	63	63	63	75	75	75	68	68	80	80	72	72	72
				fz	0.009	0.009	0.008	0.008	0.008	0.014	0.014	0.014	0.013	0.013	0.021	0.021	0.019	0.019	0.017
				RPM	7427	6685	6685	6685	6685	5968	5968	5968	5411	5411	5093	5093	4584	4584	4584
				FEED	267	241	214	214	214	334	334	334	281	281	428	428	348	348	312
	11.2	0.05D	2.5D	Vc	40	36	36	36	36	43	43	43	39	39	46	46	41	41	41
				fz	0.007	0.007	0.006	0.006	0.006	0.01	0.01	0.01	0.009	0.009	0.015	0.015	0.013	0.013	0.011
				RPM	4244	3820	3820	3820	3820	3422	3422	3422	3104	3104	2928	2928	2610	2610	2610
				FEED	119	107	92	92	92	137	137	137	112	112	176	176	136	136	115
K	15-20	0.05D	2.5D	Vc	70	63	63	63	63	75	75	75	68	68	80	80	72	72	72
				fz	0.009	0.009	0.008	0.008	0.008	0.014	0.014	0.014	0.013	0.013	0.021	0.021	0.019	0.019	0.017
				RPM	7427	6685	6685	6685	6685	5968	5968	5968	5411	5411	5093	5093	4584	4584	4584
				FEED	267	241	214	214	214	334	334	334	281	281	428	428	348	348	312
H	38.1 - 38.2	0.02D	2.0D	Vc	25	22	22	22	22	27	27	27	24	24	30	30	27	27	27
				fz	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.008	0.011	0.011	0.01	0.01	0.009
				RPM	2653	2334	2334	2334	2334	2149	2149	2149	1910	1910	1910	1910	1719	1719	1719
				FEED	64	56	56	47	47	69	69	69	61	61	84	84	69	69	62
	40	0.05D	2.5D	Vc	40	36	36	36	36	43	43	43	39	39	46	46	41	41	41
				fz	0.007	0.007	0.006	0.006	0.006	0.01	0.01	0.01	0.009	0.009	0.015	0.015	0.013	0.013	0.011
				RPM	4244	3820	3820	3820	3820	3422	3422	3422	3104	3104	2928	2928	2610	2610	2610
				FEED	119	107	92	92	92	137	137	137	112	112	176	176	136	136	115
	41	0.02D	2.0D	Vc	25	22	22	22	22	27	27	27	24	24	30	30	27	27	27
				fz	0.006	0.006	0.006	0.005	0.005	0.008	0.008	0.008	0.008	0.008	0.011	0.011	0.01	0.01	0.009
				RPM	2653	2334	2334	2334	2334	2149	2149	2149	1910	1910	1910	1910	1719	1719	1719
				FEED	64	56	56	47	47	69	69	69	61	61	84	84	69	69	62

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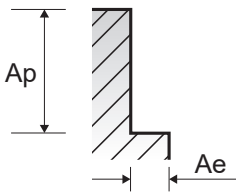

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME72 SERIES — **4 FLUTE - SIDE CUTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
LOC = Length of Cut

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)															
					10.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	14.0	14.0	16.0	16.0	16.0	16.0
				LOC	60	35	40	45	50	55	60	65	70	50	60	40	50	60	70
P	1-5	0.05D	2.5D	Vc	80	87	87	87	87	87	87	78	78	93	93	98	98	98	98
				fz	0.037	0.047	0.047	0.04	0.04	0.04	0.035	0.035	0.035	0.041	0.041	0.05	0.05	0.042	0.042
				RPM	2546	2308	2308	2308	2308	2308	2308	2069	2069	2114	2114	1950	1950	1950	1950
				FEED	377	434	434	369	369	369	323	290	290	347	347	390	390	328	328
	6-8	0.05D	2.5D	Vc	80	87	87	87	87	87	87	78	78	93	93	98	98	98	98
				fz	0.037	0.047	0.047	0.04	0.04	0.04	0.035	0.035	0.035	0.041	0.041	0.05	0.05	0.042	0.042
				RPM	2546	2308	2308	2308	2308	2308	2308	2069	2069	2114	2114	1950	1950	1950	1950
				FEED	377	434	434	369	369	369	323	290	290	347	347	390	390	328	328
	9	0.05D	2.5D	Vc	46	52	52	52	52	52	52	47	47	54	54	54	54	54	54
				fz	0.024	0.034	0.034	0.03	0.03	0.03	0.026	0.026	0.026	0.029	0.029	0.035	0.035	0.03	0.03
				RPM	1464	1379	1379	1379	1379	1379	1379	1247	1247	1228	1228	1074	1074	1074	1074
				FEED	141	188	188	166	166	166	143	130	130	142	142	150	150	129	129
	10-11.1	0.05D	2.5D	Vc	80	87	87	87	87	87	87	78	78	93	93	98	98	98	98
				fz	0.037	0.047	0.047	0.04	0.04	0.04	0.035	0.035	0.035	0.041	0.041	0.05	0.05	0.042	0.042
				RPM	2546	2308	2308	2308	2308	2308	2308	2069	2069	2114	2114	1950	1950	1950	1950
				FEED	377	434	434	369	369	369	323	290	290	347	347	390	390	328	328
	11.2	0.05D	2.5D	Vc	46	52	52	52	52	52	52	47	47	54	54	54	54	54	54
				fz	0.024	0.034	0.034	0.03	0.03	0.03	0.026	0.026	0.026	0.029	0.029	0.035	0.035	0.03	0.03
				RPM	1464	1379	1379	1379	1379	1379	1379	1247	1247	1228	1228	1074	1074	1074	1074
				FEED	141	188	188	166	166	166	143	130	130	142	142	150	150	129	129
K	15-20	0.05D	2.5D	Vc	80	87	87	87	87	87	87	78	78	93	93	98	98	98	98
				fz	0.037	0.047	0.047	0.04	0.04	0.04	0.035	0.035	0.035	0.041	0.041	0.05	0.05	0.042	0.042
				RPM	2546	2308	2308	2308	2308	2308	2308	2069	2069	2114	2114	1950	1950	1950	1950
				FEED	377	434	434	369	369	369	323	290	290	347	347	390	390	328	328
H	38.1 - 38.2	0.02D	2.0D	Vc	29	32	32	32	32	32	32	29	29	33	33	34	34	34	34
				fz	0.021	0.025	0.025	0.021	0.021	0.021	0.019	0.018	0.018	0.021	0.021	0.026	0.026	0.022	0.022
				RPM	923	849	849	849	849	849	849	769	769	750	750	676	676	676	676
				FEED	78	85	85	71	71	71	65	55	55	63	63	70	70	60	60
	40	0.05D	2.5D	Vc	46	52	52	52	52	52	52	47	47	54	54	54	54	54	54
				fz	0.024	0.034	0.034	0.03	0.03	0.03	0.026	0.026	0.026	0.029	0.029	0.035	0.035	0.03	0.03
				RPM	1464	1379	1379	1379	1379	1379	1379	1247	1247	1228	1228	1074	1074	1074	1074
				FEED	141	188	188	166	166	166	143	130	130	142	142	150	150	129	129
	41	0.02D	2.0D	Vc	29	32	32	32	32	32	32	29	29	33	33	34	34	34	34
				fz	0.021	0.025	0.025	0.021	0.021	0.021	0.019	0.018	0.018	0.021	0.021	0.026	0.026	0.022	0.022
				RPM	923	849	849	849	849	849	849	769	769	750	750	676	676	676	676
				FEED	78	85	85	71	71	71	65	55	55	63	63	70	70	60	60

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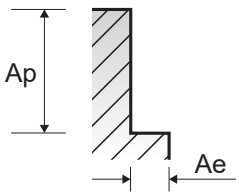

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME73 SERIES — **4 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
			LBS	2	3	4	5	6	7	8	10	12	14	16	18	20	22	26	30	40
P	1-5	Non-alloy steel	Vc	69	69	69	69	62	62	62	62	55	55	41	41	41	21	21	21	7
			fz	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	21963	21963	21963	21963	19735	19735	19735	19735	17507	17507	13051	13051	13051	6685	6685	6685	2228
			FEED	351	351	351	351	237	237	237	237	210	210	104	104	104	53	53	53	18
			Ae	0.021	0.021	0.015	0.015	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
	6-8	Low alloy steel	Vc	69	69	69	69	62	62	62	62	55	55	41	41	41	21	21	21	7
			fz	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	21963	21963	21963	21963	19735	19735	19735	19735	17507	17507	13051	13051	13051	6685	6685	6685	2228
			FEED	351	351	351	351	237	237	237	237	210	210	104	104	104	53	53	53	18
			Ae	0.021	0.021	0.015	0.015	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
	9		Vc	42	42	42	42	38	38	38	38	34	34	25	25	25	13	13	13	4
			fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	13369	13369	13369	13369	12096	12096	12096	12096	10823	10823	7958	7958	7958	4138	4138	4138	1273
			FEED	160	160	160	160	145	145	145	145	130	130	64	64	64	33	33	33	10
			Ae	0.016	0.016	0.011	0.011	0.006	0.006	0.006	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	10-11.1	High alloyed steel, and tool steel	Vc	69	69	69	69	62	62	62	62	55	55	41	41	41	21	21	21	7
			fz	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	21963	21963	21963	21963	19735	19735	19735	19735	17507	17507	13051	13051	13051	6685	6685	6685	2228
			FEED	351	351	351	351	237	237	237	237	210	210	104	104	104	53	53	53	18
			Ae	0.021	0.021	0.015	0.015	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
	11.2		Vc	42	42	42	42	38	38	38	38	34	34	25	25	25	13	13	13	4
			fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	13369	13369	13369	13369	12096	12096	12096	12096	10823	10823	7958	7958	7958	4138	4138	4138	1273
			FEED	160	160	160	160	145	145	145	145	130	130	64	64	64	33	33	33	10
			Ae	0.016	0.016	0.011	0.011	0.006	0.006	0.006	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	69	69	69	69	62	62	62	62	55	55	41	41	41	21	21	21	7
			fz	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	21963	21963	21963	21963	19735	19735	19735	19735	17507	17507	13051	13051	13051	6685	6685	6685	2228
			FEED	351	351	351	351	237	237	237	237	210	210	104	104	104	53	53	53	18
			Ae	0.021	0.021	0.015	0.015	0.008	0.008	0.008	0.005	0.005	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002
H	38.1 - 38.2	Hardened steel	Vc	27	27	27	27	24	24	24	24	21	21	16	16	16	8	8	8	3
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	8594	8594	8594	8594	7639	7639	7639	7639	6685	6685	5093	5093	5093	2546	2546	2546	955
			FEED	34	34	34	34	31	31	31	31	27	27	20	20	20	10	10	10	4
			Ae	0.013	0.013	0.009	0.009	0.005	0.005	0.005	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
	40	Chilled Cast Iron	Vc	42	42	42	42	38	38	38	38	34	34	25	25	25	13	13	13	4
			fz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
			RPM	13369	13369	13369	13369	12096	12096	12096	12096	10823	10823	7958	7958	7958	4138	4138	4138	1273
			FEED	160	160	160	160	145	145	145	145	130	130	64	64	64	33	33	33	10
			Ae	0.016	0.016	0.011	0.011	0.006	0.006	0.006	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	41	Hardened Cast Iron	Vc	27	27	27	27	24	24	24	24	21	21	16	16	16	8	8	8	3
			fz	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
			RPM	8594	8594	8594	8594	7639	7639	7639	7639	6685	6685	5093	5093	5093	2546	2546	2546	955
			FEED	34	34	34	34	31	31	31	31	27	27	20	20	20	10	10	10	4
			Ae	0.013	0.013	0.009	0.009	0.005	0.005	0.005	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001

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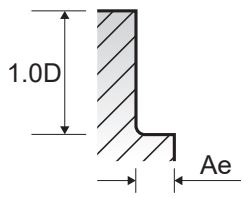

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME73 SERIES — 4 FLUTE - SIDE CUTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																			
			1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5
		LBS	22	26	30	6	8	10	12	16	18	20	22	26	30	35	40	45	50	60	8	10
P	1-5	Vc	64	48	48	87	87	87	79	79	79	79	70	70	70	52	52	26	26	26	94	94
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.007	0.007
		RPM	13581	10186	10186	13846	13846	13846	12573	12573	12573	12573	11141	11141	11141	8276	8276	4138	4138	4138	11968	11968
		FEED	217	122	122	332	332	332	251	251	251	251	223	223	223	132	132	66	66	66	335	335
		Ae	0.005	0.003	0.003	0.042	0.029	0.029	0.017	0.017	0.011	0.011	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037
	6-8	Vc	64	48	48	87	87	87	79	79	79	79	70	70	70	52	52	26	26	26	94	94
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.007	0.007
		RPM	13581	10186	10186	13846	13846	13846	12573	12573	12573	12573	11141	11141	11141	8276	8276	4138	4138	4138	11968	11968
		FEED	217	122	122	332	332	332	251	251	251	251	223	223	223	132	132	66	66	66	335	335
		Ae	0.005	0.003	0.003	0.042	0.029	0.029	0.017	0.017	0.011	0.011	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037
	9	Vc	40	30	30	57	57	57	51	51	51	51	46	46	46	34	34	17	17	17	60	60
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.007	0.007
		RPM	8488	6366	6366	9072	9072	9072	8117	8117	8117	8117	7321	7321	7321	5411	5411	2706	2706	2706	7639	7639
		FEED	136	76	76	218	218	218	162	162	162	162	117	117	117	87	87	32	32	32	214	214
		Ae	0.004	0.002	0.002	0.032	0.022	0.022	0.013	0.013	0.008	0.008	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028
	10-11.1	Vc	64	48	48	87	87	87	79	79	79	79	70	70	70	52	52	26	26	26	94	94
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.007	0.007
		RPM	13581	10186	10186	13846	13846	13846	12573	12573	12573	12573	11141	11141	11141	8276	8276	4138	4138	4138	11968	11968
		FEED	217	122	122	332	332	332	251	251	251	251	223	223	223	132	132	66	66	66	335	335
		Ae	0.005	0.003	0.003	0.042	0.029	0.029	0.017	0.017	0.011	0.011	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037
	11.2	Vc	40	30	30	57	57	57	51	51	51	51	46	46	46	34	34	17	17	17	60	60
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.007	0.007
		RPM	8488	6366	6366	9072	9072	9072	8117	8117	8117	8117	7321	7321	7321	5411	5411	2706	2706	2706	7639	7639
		FEED	136	76	76	218	218	218	162	162	162	162	117	117	117	87	87	32	32	32	214	214
		Ae	0.004	0.002	0.002	0.032	0.022	0.022	0.013	0.013	0.008	0.008	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028
K	15-20	Vc	64	48	48	87	87	87	79	79	79	79	70	70	70	52	52	26	26	26	94	94
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.007	0.007
		RPM	13581	10186	10186	13846	13846	13846	12573	12573	12573	12573	11141	11141	11141	8276	8276	4138	4138	4138	11968	11968
		FEED	217	122	122	332	332	332	251	251	251	251	223	223	223	132	132	66	66	66	335	335
		Ae	0.005	0.003	0.003	0.042	0.029	0.029	0.017	0.017	0.011	0.011	0.011	0.011	0.006	0.004	0.004	0.004	0.004	0.004	0.037	0.037
H	38.1 - 38.2	Vc	25	18	18	38	38	38	34	34	34	34	30	30	30	23	23	11	11	11	35	35
		fz	0.001	0.001	0.001	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.003	0.003
		RPM	5305	3820	3820	6048	6048	6048	5411	5411	5411	5411	4775	4775	4775	3661	3661	1751	1751	1751	4456	4456
		FEED	21	15	15	73	73	73	43	43	43	43	38	38	38	29	29	7	7	7	53	53
		Ae	0.003	0.002	0.002	0.025	0.018	0.018	0.01	0.01	0.006	0.006	0.006	0.006	0.004	0.003	0.003	0.003	0.003	0.003	0.022	0.022
	40	Vc	40	30	30	57	57	57	51	51	51	51	46	46	46	34	34	17	17	17	60	60
		fz	0.004	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.007	0.007
		RPM	8488	6366	6366	9072	9072	9072	8117	8117	8117	8117	7321	7321	7321	5411	5411	2706	2706	2706	7639	7639
		FEED	136	76	76	218	218	218	162	162	162	162	117	117	117	87	87	32	32	32	214	214
		Ae	0.004	0.002	0.002	0.032	0.022	0.022	0.013	0.013	0.008	0.008	0.008	0.008	0.005	0.003	0.003	0.003	0.003	0.003	0.028	0.028
	41	Vc	25	18	18	38	38	38	34	34	34	34	30	30	30	23	23	11	11	11	35	35
		fz	0.001	0.001	0.001	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.003	0.003
		RPM	5305	3820	3820	6048	6048	6048	5411	5411	5411	5411	4775	4775	4775	3661	3661	1751	1751	1751	4456	4456
		FEED	21	15	15	73	73	73	43	43	43	43	38	38	38	29	29	7	7	7	53	53
		Ae	0.003	0.002	0.002	0.025	0.018	0.018	0.01	0.01	0.006	0.006	0.006	0.006	0.004	0.003	0.003	0.003	0.003	0.003	0.022	0.022

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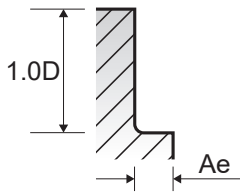

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
Ap = mm
LBS = Length Below Shank

SEME73 SERIES — 4 FLUTE - SIDE CUTTING

ISO	VDI 3323	Parameter	Diameter (Ø)																		
			3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
		LBS	30	35	40	45	50	60	8	10	12	14	16	18	20	22	26	30	35	40	45	50
P	1-5	Vc	91	81	81	81	61	61	114	114	114	114	114	114	114	103	103	103	103	103	91	91
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	9655	8594	8594	8594	6472	6472	9072	9072	9072	9072	9072	9072	9072	8196	8196	8196	8196	8196	7242	7242
		FEED	309	241	241	241	155	155	689	689	689	689	689	689	689	557	557	557	557	557	434	434
		Ae	0.016	0.016	0.009	0.009	0.006	0.006	0.084	0.084	0.084	0.059	0.059	0.059	0.059	0.034	0.034	0.034	0.021	0.021	0.021	0.021
	6-8	Vc	91	81	81	81	61	61	114	114	114	114	114	114	114	103	103	103	103	103	91	91
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	9655	8594	8594	8594	6472	6472	9072	9072	9072	9072	9072	9072	9072	8196	8196	8196	8196	8196	7242	7242
		FEED	309	241	241	241	155	155	689	689	689	689	689	689	689	557	557	557	557	557	434	434
		Ae	0.016	0.016	0.009	0.009	0.006	0.006	0.084	0.084	0.084	0.059	0.059	0.059	0.059	0.034	0.034	0.034	0.021	0.021	0.021	0.021
	9	Vc	57	50	50	50	38	38	70	70	70	70	70	70	70	63	63	63	63	63	56	56
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	6048	5305	5305	5305	4032	4032	5570	5570	5570	5570	5570	5570	5570	5013	5013	5013	5013	5013	4456	4456
		FEED	194	149	149	149	97	97	423	423	423	423	423	423	423	341	341	341	341	341	267	267
		Ae	0.012	0.012	0.007	0.007	0.005	0.005	0.063	0.063	0.063	0.044	0.044	0.044	0.044	0.025	0.025	0.025	0.016	0.016	0.016	0.016
	10-11.1	Vc	91	81	81	81	61	61	114	114	114	114	114	114	114	103	103	103	103	103	91	91
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	9655	8594	8594	8594	6472	6472	9072	9072	9072	9072	9072	9072	9072	8196	8196	8196	8196	8196	7242	7242
		FEED	309	241	241	241	155	155	689	689	689	689	689	689	689	557	557	557	557	557	434	434
		Ae	0.016	0.016	0.009	0.009	0.006	0.006	0.084	0.084	0.084	0.059	0.059	0.059	0.059	0.034	0.034	0.034	0.021	0.021	0.021	0.021
	11.2	Vc	57	50	50	50	38	38	70	70	70	70	70	70	70	63	63	63	63	63	56	56
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	6048	5305	5305	5305	4032	4032	5570	5570	5570	5570	5570	5570	5570	5013	5013	5013	5013	5013	4456	4456
		FEED	194	149	149	149	97	97	423	423	423	423	423	423	423	341	341	341	341	341	267	267
		Ae	0.012	0.012	0.007	0.007	0.005	0.005	0.063	0.063	0.063	0.044	0.044	0.044	0.044	0.025	0.025	0.025	0.016	0.016	0.016	0.016
K	15-20	Vc	91	81	81	81	61	61	114	114	114	114	114	114	114	103	103	103	103	103	91	91
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	9655	8594	8594	8594	6472	6472	9072	9072	9072	9072	9072	9072	9072	8196	8196	8196	8196	8196	7242	7242
		FEED	309	241	241	241	155	155	689	689	689	689	689	689	689	557	557	557	557	557	434	434
		Ae	0.016	0.016	0.009	0.009	0.006	0.006	0.084	0.084	0.084	0.059	0.059	0.059	0.059	0.034	0.034	0.034	0.021	0.021	0.021	0.021
H	38.1 - 38.2	Vc	34	30	30	30	23	23	44	44	44	44	44	44	44	40	40	40	40	40	35	35
		fz	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		RPM	3608	3183	3183	3183	2440	2440	3501	3501	3501	3501	3501	3501	3501	3183	3183	3183	3183	3183	2785	2785
		FEED	58	38	38	38	29	29	70	70	70	70	70	70	70	51	51	51	51	51	45	45
		Ae	0.009	0.009	0.006	0.006	0.004	0.004	0.05	0.05	0.05	0.035	0.035	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.013	0.013
	40	Vc	57	50	50	50	38	38	70	70	70	70	70	70	70	63	63	63	63	63	56	56
		fz	0.008	0.007	0.007	0.007	0.006	0.006	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.017	0.017	0.017	0.017	0.017	0.015	0.015
		RPM	6048	5305	5305	5305	4032	4032	5570	5570	5570	5570	5570	5570	5570	5013	5013	5013	5013	5013	4456	4456
		FEED	194	149	149	149	97	97	423	423	423	423	423	423	423	341	341	341	341	341	267	267
		Ae	0.012	0.012	0.007	0.007	0.005	0.005	0.063	0.063	0.063	0.044	0.044	0.044	0.044	0.025	0.025	0.025	0.016	0.016	0.016	0.016
	41	Vc	34	30	30	30	23	23	44	44	44	44	44	44	44	40	40	40	40	40	35	35
		fz	0.004	0.003	0.003	0.003	0.003	0.003	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		RPM	3608	3183	3183	3183	2440	2440	3501	3501	3501	3501	3501	3501	3501	3183	3183	3183	3183	3183	2785	2785
		FEED	58	38	38	38	29	29	70	70	70	70	70	70	70	51	51	51	51	51	45	45
		Ae	0.009	0.009	0.006	0.006	0.004	0.004	0.05	0.05	0.05	0.035	0.035	0.035	0.035	0.02	0.02	0.02	0.013	0.013	0.013	0.013

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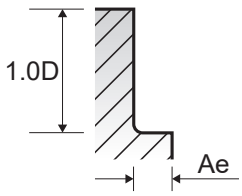

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

SEME75 SERIES — 6 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.
LOC = Length of Cut

NORMAL SPEED

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						6.0	6.0	6.0	8.0	8.0	8.0	8.0	10.0	10.0	10.0
					LOC	15	20	30	20	30	35	40	25	30	40
P	1-5	Non-alloy steel	0.1D	1.5D	Vc	110	110	110	111	111	111	111	111	111	111
					fz	0.06	0.06	0.051	0.079	0.079	0.079	0.067	0.099	0.099	0.099
					RPM	5836	5836	5836	4417	4417	4417	4417	3533	3533	3533
					FEED	2101	2101	1786	2093	2093	2093	1775	2099	2099	2099
	6-8	Low alloy steel	0.1D	1.5D	Vc	110	110	110	111	111	111	111	111	111	111
					fz	0.06	0.06	0.051	0.079	0.079	0.079	0.067	0.099	0.099	0.099
					RPM	5836	5836	5836	4417	4417	4417	4417	3533	3533	3533
					FEED	2101	2101	1786	2093	2093	2093	1775	2099	2099	2099
	9		0.05D	1.5D	Vc	77	77	77	78	78	78	78	76	76	76
					fz	0.059	0.059	0.05	0.078	0.078	0.078	0.066	0.099	0.099	0.099
					RPM	4085	4085	4085	3104	3104	3104	3104	2419	2419	2419
					FEED	1446	1446	1225	1452	1452	1452	1229	1437	1437	1437
	10-11.1	High alloyed steel, and tool steel	0.1D	1.5D	Vc	110	110	110	111	111	111	111	111	111	111
					fz	0.06	0.06	0.051	0.079	0.079	0.079	0.067	0.099	0.099	0.099
					RPM	5836	5836	5836	4417	4417	4417	4417	3533	3533	3533
					FEED	2101	2101	1786	2093	2093	2093	1775	2099	2099	2099
	11.2		0.05D	1.5D	Vc	77	77	77	78	78	78	78	76	76	76
					fz	0.059	0.059	0.05	0.078	0.078	0.078	0.066	0.099	0.099	0.099
					RPM	4085	4085	4085	3104	3104	3104	3104	2419	2419	2419
					FEED	1446	1446	1225	1452	1452	1452	1229	1437	1437	1437
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	110	110	110	111	111	111	111	111	111	111
					fz	0.06	0.06	0.051	0.079	0.079	0.079	0.067	0.099	0.099	0.099
					RPM	5836	5836	5836	4417	4417	4417	4417	3533	3533	3533
					FEED	2101	2101	1786	2093	2093	2093	1775	2099	2099	2099
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	31	31	31	31	31	31	31	33	33	33
					fz	0.022	0.022	0.019	0.03	0.03	0.03	0.026	0.035	0.035	0.035
					RPM	1645	1645	1645	1233	1233	1233	1233	1050	1050	1050
					FEED	217	217	187	222	222	222	192	221	221	221
	40	Chilled Cast Iron	0.05D	1.5D	Vc	77	77	77	78	78	78	78	76	76	76
					fz	0.059	0.059	0.05	0.078	0.078	0.078	0.066	0.099	0.099	0.099
					RPM	4085	4085	4085	3104	3104	3104	3104	2419	2419	2419
					FEED	1446	1446	1225	1452	1452	1452	1229	1437	1437	1437
	41	Hardened Cast Iron	0.05D	1.0D	Vc	31	31	31	31	31	31	31	33	33	33
					fz	0.022	0.022	0.019	0.03	0.03	0.03	0.026	0.035	0.035	0.035
					RPM	1645	1645	1645	1233	1233	1233	1233	1050	1050	1050
					FEED	217	217	187	222	222	222	192	221	221	221

HIGH SPEED

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						6.0	6.0	6.0	8.0	8.0	8.0	8.0	10.0	10.0	10.0
					LOC	15	20	30	20	30	35	40	25	30	40
P	11.2	High alloyed steel, and tool steel	0.05D	1.5D	Vc	333	333	333	333	333	333	333	329	329	329
					fz	0.06	0.06	0.051	0.081	0.081	0.081	0.068	0.1	0.1	0.1
					RPM	17666	17666	17666	13250	13250	13250	13250	10472	10472	10472
					FEED	6360	6360	5406	6439	6439	6439	5406	6283	6283	6283
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	166	166	166	166	166	166	166	166	166	166
					fz	0.061	0.061	0.051	0.081	0.081	0.081	0.069	0.101	0.101	0.101
					RPM	8807	8807	8807	6605	6605	6605	6605	5284	5284	5284
					FEED	3223	3223	2695	3210	3210	3210	2734	3202	3202	3202
	40	Chilled Cast Iron	0.05D	1.5D	Vc	333	333	333	333	333	333	333	329	329	329
					fz	0.06	0.06	0.051	0.081	0.081	0.081	0.068	0.1	0.1	0.1
					RPM	17666	17666	17666	13250	13250	13250	13250	10472	10472	10472
					FEED	6360	6360	5406	6439	6439	6439	5406	6283	6283	6283
	41	Hardened Cast Iron	0.05D	1.0D	Vc	166	166	166	166	166	166	166	166	166	166
					fz	0.061	0.061	0.051	0.081	0.081	0.081	0.069	0.101	0.101	0.101
					RPM	8807	8807	8807	6605	6605	6605	6605	5284	5284	5284
					FEED	3223	3223	2695	3210	3210	3210	2734	3202	3202	3202

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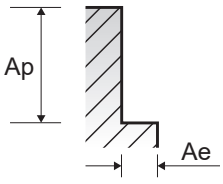


4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

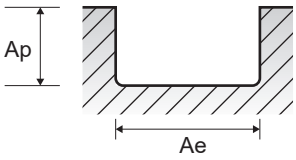
G9D75 G9D76 G9D77 G9D67 G9D68 G9D69

4&5 FLUTE CORNER RADIUS ROUGHING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

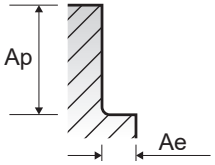
SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-3	Non-alloy steel	1.0D	1.0D	Vc	225	225	225	225	225	225
					fz	0.032	0.046	0.057	0.064	0.067	0.074
					RPM	11937	8952	7162	5968	4476	3581
					FEED	1528	1647	1633	1528	1500	1325
	4-5		1.0D	0.8D	Vc	200	205	200	205	205	200
					fz	0.026	0.036	0.046	0.053	0.051	0.056
					RPM	10610	8157	6366	5438	4078	3183
					FEED	1103	1175	1171	1153	1040	891
	6	Low alloy steel	1.0D	1.0D	Vc	225	225	225	225	225	225
					fz	0.032	0.046	0.057	0.064	0.067	0.074
					RPM	11937	8952	7162	5968	4476	3581
					FEED	1528	1647	1633	1528	1500	1325
	7-9		1.0D	0.8D	Vc	200	205	200	205	205	200
					fz	0.026	0.036	0.046	0.053	0.051	0.056
					RPM	10610	8157	6366	5438	4078	3183
					FEED	1103	1175	1171	1153	1040	891
	10	High alloyed steel, and tool steel	1.0D	1.0D	Vc	225	225	225	225	225	225
					fz	0.032	0.046	0.057	0.064	0.067	0.074
					RPM	11937	8952	7162	5968	4476	3581
					FEED	1528	1647	1633	1528	1500	1325
	11.1		1.0D	0.8D	Vc	200	205	200	205	205	200
					fz	0.026	0.036	0.046	0.053	0.051	0.056
					RPM	10610	8157	6366	5438	4078	3183
					FEED	1103	1175	1171	1153	1040	891
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	Vc	225	225	225	225	225	225
					fz	0.032	0.046	0.057	0.064	0.067	0.074
					RPM	11937	8952	7162	5968	4476	3581
					FEED	1528	1647	1633	1528	1500	1325



SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-3	Non-alloy steel	0.5D	1.0D	Vc	300	300	300	300	300	300
					fz	0.041	0.057	0.071	0.08	0.082	0.089
					RPM	15915	11937	9549	7958	5968	4775
					FEED	2610	2722	2712	2546	2447	2125
	4-5		0.35D	1.0D	Vc	270	270	265	270	270	270
					fz	0.032	0.046	0.057	0.065	0.065	0.07
					RPM	14324	10743	8435	7162	5371	4297
					FEED	1833	1977	1923	1862	1746	1504
	6	Low alloy steel	0.5D	1.0D	Vc	300	300	300	300	300	300
					fz	0.041	0.057	0.071	0.08	0.082	0.089
					RPM	15915	11937	9549	7958	5968	4775
					FEED	2610	2722	2712	2546	2447	2125
	7-9		0.35D	1.0D	Vc	270	270	265	270	270	270
					fz	0.032	0.046	0.057	0.065	0.065	0.07
					RPM	14324	10743	8435	7162	5371	4297
					FEED	1833	1977	1923	1862	1746	1504
	10	High alloyed steel, and tool steel	0.5D	1.0D	Vc	300	300	300	300	300	300
					fz	0.041	0.057	0.071	0.08	0.082	0.089
					RPM	15915	11937	9549	7958	5968	4775
					FEED	2610	2722	2712	2546	2447	2125
	11.1		0.35D	1.0D	Vc	270	270	265	270	270	270
					fz	0.032	0.046	0.057	0.065	0.065	0.07
					RPM	14324	10743	8435	7162	5371	4297
					FEED	1833	1977	1923	1862	1746	1504
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.0D	Vc	300	300	300	300	300	300
					fz	0.041	0.057	0.071	0.08	0.082	0.089
					RPM	15915	11937	9549	7958	5968	4775
					FEED	2610	2722	2712	2546	2447	2125



Leading Through Innovation

SOLID CARBIDE

X-POWER PRO END MILLS

X-POWER PRO VHM - FRÄSER

- For Pre-Hardened Steels up to HRc55
- Für vorgehärtete Stähle bis HRc55

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
X-POWER PRO
END MILLS

for Pre-Hardened Steels up to HRc55,
Mold & Die, Dry & Wet Cutting

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C394

SERIES	GM876	GM813	GM886	GM902
FLUTE	2	2	2	2
HELIX ANGLE	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R0.5	R0.5	R0.25	R0.5
SIZE MAX	R8.0	R10.0	R3.0	R4.0
PAGE	C372	C373	C374	C376
	SHORT LENGTH	LONG LENGTH	RIB PROCESSING	TAPER NECK
	Y-Coating	Y-Coating	Y-Coating	Y-Coating

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	GM876	GM813	GM886	GM902
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	○
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	○
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	○
	6	Low alloy steel		Annealed	180	10	○	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎	○
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○
	11			Quenched & Tempered	325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	
	16		Pearlitic (Martensitic)		260	26	○	○	○	
	17	Nodular cast iron	Ferritic		160	3	○	○	○	
	18		Pearlitic		250	25	○	○	○	
	19	Malleable cast iron	Ferritic		130		○	○	○	
	20		Pearlitic		230	21	○	○	○	
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55	○	○	○	○
	39			Hardened	630	60	○			
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	○	○	○	○

X-POWER PRO END MILLS

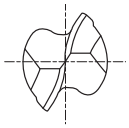
PLAIN SHANK **GM876 SERIES**

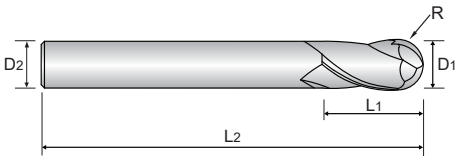
CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

VOLLHARTMETALL, 2 SCHNEIDEN KURZ KUGELSTIRN
Fraise carbure, 2 dents, hémisphérique, courte
2 TAGLIENTI, SEMISFERICA, SERIE CORTA

- Economic type with short overall length.
- Radius tolerance ±0.02mm & short length of cut.

- Günstige Variante, kurze Gesamlänge.
- Radius Toleranz ±0.02mm und kurze Schneidenlänge.





CARBIDE | 2 | 30° | R ±0.02 | PLAIN | Y Coating

p.C394~C395

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R(±0.02)	D1	D2	L1	L2
GM876010	R0.5	1.0	3	3	38
GM876020	R1.0	2.0	6	3	50
GM876030	R1.5	3.0	6	4	50
GM876040	R2.0	4.0	6	5	54
GM876060	R.3.0	6.0	6	7	54
GM876080	R4.0	8.0	8	9	58
GM876100	R5.0	10.0	10	11	66
GM876120	R6.0	12.0	12	12	73
GM876160	R8.0	16.0	16	16	82

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

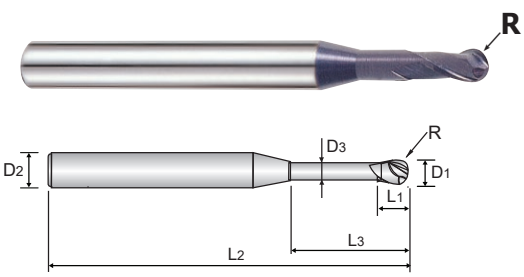
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	○	◎	○

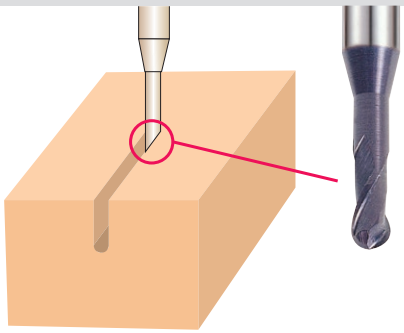
X-POWER PRO END MILLS

PLAIN SHANK **GM886 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN KUGELSTIRN für SCHMALE RIPPEN
Fraise carbure, 2 dents, hémisphérique pour usinage de rainure
2 TAGLIENTI, SEMISFERICA PER NERVATURE





CARBIDE | 2 | 30° | R ±0.01 | PLAIN | Y Coating

p.C396~C397

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R(±0.01)	D1	D2	L1	L3	L2	D3
GM886005	R0.25	0.5	4	0.7	2	45	0.45
GM886962	R0.25	0.5	4	0.7	4	45	0.45
GM886957	R0.3	0.6	4	0.9	2	45	0.55
GM886915	R0.3	0.6	4	0.9	4	45	0.55
GM886916	R0.3	0.6	4	0.9	6	45	0.55
GM886919	R0.4	0.8	4	1.2	4	45	0.75
GM886008	R0.4	0.8	4	1.2	6	45	0.75
GM886921	R0.5	1.0	4	1.5	4	45	0.95
GM886923	R0.5	1.0	4	1.5	5	45	0.95
GM886010	R0.5	1.0	4	1.5	6	45	0.95
GM886902	R0.5	1.0	4	1.5	8	45	0.95
GM886903	R0.5	1.0	4	1.5	10	45	0.95
GM886904	R0.5	1.0	4	1.5	12	45	0.95
GM886927	R0.5	1.0	4	1.5	16	50	0.95
GM886012	R0.6	1.2	4	1.8	8	45	1.15
GM886930	R0.75	1.5	4	2.3	6	45	1.45
GM886015	R0.75	1.5	4	2.3	8	45	1.45
GM886931	R0.75	1.5	4	2.3	10	45	1.45
GM886906	R0.75	1.5	4	2.3	12	45	1.45
GM886940	R1.0	2.0	4	3	6	45	1.95
GM886020	R1.0	2.0	4	3	8	45	1.95
GM886941	R1.0	2.0	4	3	10	45	1.95
GM886942	R1.0	2.0	4	3	12	50	1.95
GM886909	R1.0	2.0	4	3	16	50	1.95

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

X-POWER PRO END MILLS

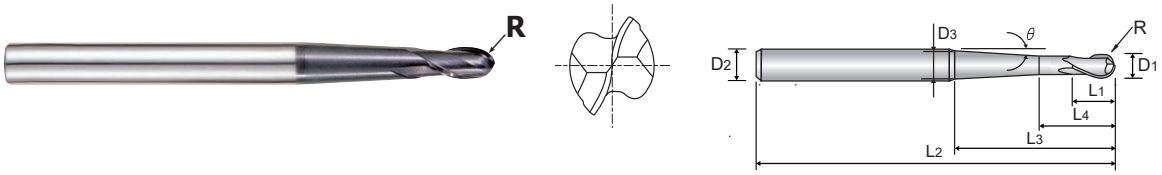
PLAIN SHANK **GM902 SERIES**

CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK

VOLLHARTMETALL, 2 SCHNEIDEN KUGELSTIRN mit KONISCH ABGESETZTEM SCHAFTTEIL
Fraise carbure, 2 dents, hémisphérique avec entrée conique
2 TAGLIENTI, SEMISFERICA, SCARICO CONICO

▶ High efficiency milling in deep slotting due to long projection of the end mills.

▶Effizientes Tiefnutenfräsen von tiefliegenden Bereichen möglich.



CARBIDE | 2 | 30° | R ±0.01 | PLAIN | Y Coating

p.C398~C399

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Under Neck Parallel Length	Length Below Shank	Overall Length	Neck Diameter	Taper Neck Angle
	R(±0.01)	D1	D2	L1	L4	L3	L2	D3	θ
GM902010	R0.5	1.0	6	2	4	23	60	2	1° 30´
GM902901	R0.5	1.0	6	2	4	23	60	4.3	5°
GM902902	R0.5	1.0	6	2	4	42	80	5	3°
GM902020	R1.0	2.0	6	4	6	23	60	2.9	1° 30´
GM902903	R1.0	2.0	6	4	6	23	60	5	5°
GM902904	R1.0	2.0	6	4	6	41	80	5.7	3°
GM902030	R1.5	3.0	6	6	8	32	70	5.6	3°
GM902905	R1.5	3.0	6	6	8	52	90	5.3	1° 30´
GM902040	R2.0	4.0	6	8	10	28	70	5.9	3°
GM902906	R2.0	4.0	6	8	10	49	90	6	1° 30´
GM902060	R3.0	6.0	8	12	15	34	90	8	3°
GM902908	R3.0	6.0	8	12	15	53	110	8	1° 30´
GM902080	R4.0	8.0	10	14	17	36	100	10	3°
GM902909	R4.0	8.0	10	14	17	55	120	10	1° 30´

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	◎	◎	○	◎									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

X-POWER PRO END MILLS

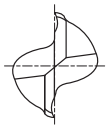
PLAIN SHANK **GM818 SERIES**

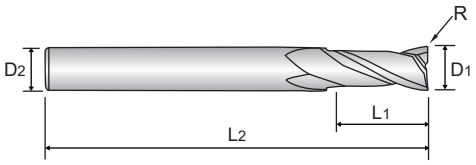
CARBIDE, 2 FLUTE LONG LENGTH CORNER RADIUS

VOLLHARTMETALL, 2 SCHNEIDEN LANG ECKENRADIUS
Fraise carbure, 2 dents, torique, longue
2 TAGLIENTI, TORICA, SERIE LUNGA

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- Superior workpiece finishes.
- Increased feed rates.

- Zur Bearbeitung von Werkzeugstählen, Legierten Stählen, Stahlguß und gehärteten Stählen.
- Bessere Werkstückoberflächen.
- Höhere Vorschubwerte.





CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C401

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GM818911	R0.5	**4.0**	6	15	50
GM818060	R0.5	**6.0**	6	20	60
GM818901	R1.0	**6.0**	6	20	60
GM818080	R0.5	**8.0**	8	25	70
GM818902	R1.0	**8.0**	8	25	70
GM818100	R0.5	**10.0**	10	30	90
GM818905	R1.0	**10.0**	10	30	90
GM818908	R1.0	**12.0**	12	30	90

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

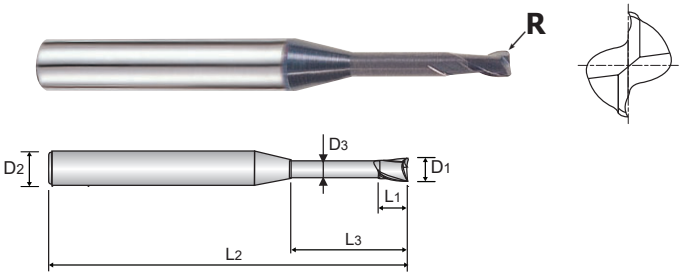
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

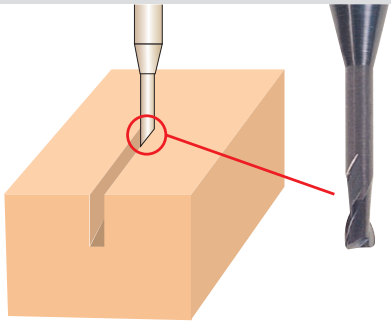
X-POWER PRO END MILLS

PLAIN SHANK **GM8A1 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS für SCHMALE RIPPEN
Fraise carbure, 2 dents, torique pour usinage de rainure
2 TAGLIENTI, TORICA PER NERVATURE





CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C403~C404

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GM8A1981	R0.3	3.0	6	4.5	16	55	2.85
GM8A1983	R0.3	3.0	6	4.5	20	60	2.85
GM8A1984	R0.3	3.0	6	4.5	25	65	2.85
GM8A1976	R0.3	3.0	6	4.5	30	70	2.85
GM8A1985	R0.3	3.0	6	4.5	40	90	2.85
GM8A1040	R0.3	4.0	6	6	12	50	3.85
GM8A1986	R0.3	4.0	6	6	16	60	3.85
GM8A1987	R0.3	4.0	6	6	20	60	3.85
GM8A1060	R0.5	6.0	6	9	20	80	5.85
GM8A1802	R0.5	6.0	6	9	40	100	5.85

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

X-POWER PRO END MILLS

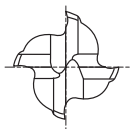
PLAIN SHANK **GM819 SERIES**

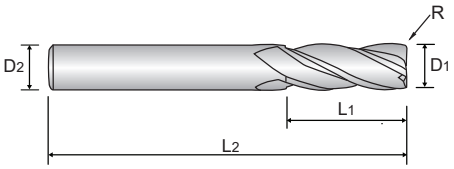
CARBIDE, 4 FLUTE LONG LENGTH CORNER RADIUS

VOLLHARTMETALL, 4 SCHNEIDEN LANG ECKENRADIUS
Fraise carbure, 4 dents, torique, longue
4 TAGLIENTI, TORICA, SERIE LUNGA

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- 4 flute allows for better workpiece finishes.
- Increased production.

- Zur Bearbeitung von Werkzeugstählen, Legierten Stählen, Stahlguß und gehärteten Stählen.
- 4 Schneiden für bessere Oberflächengüte des Werkstücks.
- Gesteigerte Productivität.





CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C406

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GM819030	R0.3	3.0	6	12	50
GM819911	R0.5	4.0	6	15	50
GM819912	R0.5	5.0	6	20	60
GM819060	R0.5	6.0	6	20	60
GM819901	R1.0	6.0	6	20	60
GM819080	R0.5	8.0	8	25	70
GM819902	R1.0	8.0	8	25	70
GM819904	R2.0	8.0	8	25	70
GM819100	R0.5	10.0	10	30	90
GM819905	R1.0	10.0	10	30	90
GM819906	R1.5	10.0	10	30	90
GM819907	R2.0	10.0	10	30	90
GM819120	R0.5	12.0	12	30	90
GM819908	R1.0	12.0	12	30	90
GM819909	R1.5	12.0	12	30	90
GM819910	R2.0	12.0	12	30	90
GM819160	R0.5	16.0	16	50	110
GM819916	R1.0	16.0	16	50	110
GM819918	R2.0	16.0	16	50	110
GM819921	R2.0	20.0	20	55	110

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

X-POWER PRO END MILLS

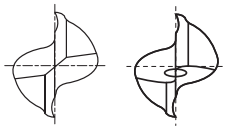
PLAIN SHANK **GM810 SERIES**

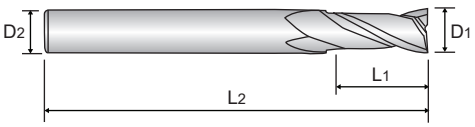
CARBIDE, 2 FLUTE SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN KURZ
Fraise carbure, 2 dents, courte
2 TAGLIENTI, SERIE CORTA

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- Superior workpiece finishes.
- Increased feed rates.

- Zur Bearbeitung: Werkzeugstählen, Legierten Stählen, Stahlguß und gehärteten Stählen.
- Bessere Werkstückoberflächen.
- Höhere Vorschübe.





CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C407

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GM810100	**10.0**	10	22	70
GM810110	**11.0**	12	22	75
GM810120	**12.0**	12	26	75
GM810140	**14.0**	14	26	85
GM810160	**16.0**	16	32	100
GM810180	**18.0**	18	32	100
GM810200	**20.0**	20	38	105

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

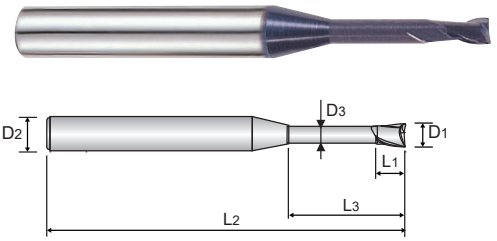
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

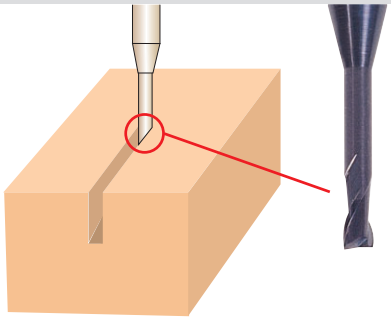
X-POWER PRO END MILLS

PLAIN SHANK **GM883 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN für SCHMALE RIPPEN
Fraise carbure, 2 dents pour usinage de rainure
2 TAGLIENTI, SCARICATA PER NERVATURE





CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C408~C409

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	L2	D3
GM883946	1.8	4	2.7	12	45	1.75
GM883958	2.0	4	3	6	45	1.95
GM883020	2.0	4	3	8	45	1.95
GM883959	2.0	4	3	10	45	1.95
GM883960	2.0	4	3	12	45	1.95
GM883961	2.0	4	3	14	50	1.95
GM883962	2.0	4	3	16	50	1.95
GM883964	2.0	4	3	20	55	1.95
GM883966	2.0	4	3	25	60	1.95
GM883814	2.0	4	3	30	70	1.95
GM883970	2.5	4	3.7	16	55	2.40
GM883975	3.0	6	4.5	10	45	2.85
GM883976	3.0	6	4.5	12	45	2.85
GM883978	3.0	6	4.5	16	55	2.85
GM883979	3.0	6	4.5	18	55	2.85
GM883980	3.0	6	4.5	20	60	2.85
GM883981	3.0	6	4.5	25	65	2.85
GM883832	3.0	6	4.5	30	70	2.85
GM883983	3.0	6	4.5	40	90	2.85

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.015	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM895 SERIES**

CARBIDE, 3 FLUTE 38° HELIX SHORT LENGTH

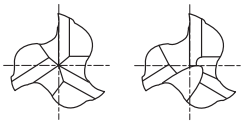
VOLLHARTMETALL, 3 SCHNEIDEN 38° RECHTSSPIRALE KURZ

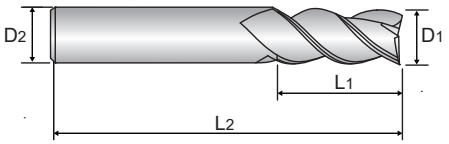
Fraise carbure, 3 dents, hélice 38°, courte

3 TAGLIENTI, ELICA 38°, SERIE CORTA

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- Possesses the advantage of 2 flute and 4 flute end mill.
- Superior workpiece finishes.

- Zur Bearbeitung: Werkzeugstählen, Legierten Stählen, Stahlguß und gehärteten Stählen.
- Besitzt die Vorteile von 2 und 4 Schneiden Fräsern
- Bessere Werkstückoberflächen





CARBIDE | 3 | 38° | PLAIN | Y Coating

p.C410-C411

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GM895010	1.0	3	2.5	38
GM895015	1.5	4	5	50
GM895025	2.5	3	7	38
GM895030	3.0	3	10	38
GM895901	3.0	6	10	50
GM895040	4.0	4	12	50
GM895050	5.0	5	14	50
GM895904	5.0	6	14	57
GM895060	6.0	6	16	57
GM895080	8.0	8	20	63
GM895100	10.0	10	22	72
GM895120	12.0	12	25	73
GM895160	16.0	16	32	82

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

X-POWER PRO END MILLS

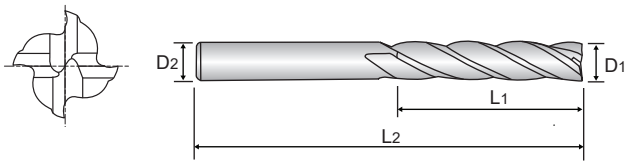
PLAIN SHANK **GM817 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN LANG
Fraise carbure, 4 dents, longue
4 TAGLIENTI, SERIE LUNGA

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- 4 flute allows for better workpiece finishes.
- Increased Productivity.

- Zur Bearbeitung: Werkzeugstählen, Legierten Stählen, Stahlguß und gehärteten Stählen.
- 4 Schneiden erzeugen eine bessere Oberfläche des Werkstücks.
- Höhere Produktivität.



CARBIDE | 4 | 30° | PLAIN | Y Coating

p.C413

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D_1	D_2	L_1	L_2
GM817020	2.0	4	8	40
GM817030	3.0	6	12	50
GM817040	4.0	6	15	50
GM817050	5.0	6	20	60
GM817060	6.0	6	20	60
GM817080	8.0	8	25	70
GM817100	10.0	10	30	90
GM817120	12.0	12	30	90
GM817140	14.0	16	40	110
GM817160	16.0	16	50	110
GM817200	20.0	20	55	110

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

X-POWER PRO END MILLS

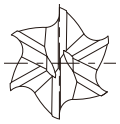
PLAIN SHANK **GM834 SERIES**

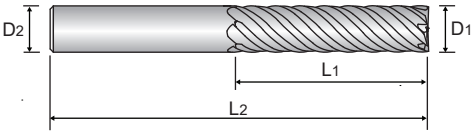
CARBIDE, 6 FLUTE 45° HELIX EXTRA LONG LENGTH

VOLLHARTMETALL, 6 SCHNEIDEN 45° RECHTSSPIRALE EXTRA LANG
Fraise carbure, 6 dents, hélice 45°, extra-longue
6 TAGLIENTI, ELICA 45°, SERIE EXTRA LUNGA

- Designed to machine hardened materials.
- High speed cutting and finish milling with high feed rates.
- Superior workpiece finishes.
- Superior wear resistance.
- Suitable for dry milling.

- Geeignet zum Fräsen von gehärteten Stählen.
- Hochgeschwindigkeitsfräsen und Finishing mit erhöhtem Vorschub.
- Bessere Werkstückoberflächen
- Höhere Verschleißfestigkeit.
- Geeignet zum Trocken-Fräsen.





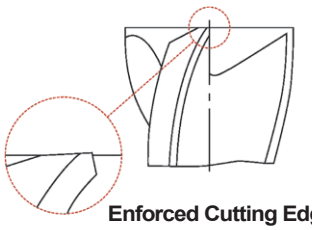
CARBIDE | 6 | 45° | PLAIN | Y Coating

p.C415

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D_1	D_2	L_1	L_2
GM834060	6.0	6	26	70
GM834080	8.0	8	36	90
GM834100	10.0	10	46	100
GM834120	12.0	12	56	110
GM834160	16.0	16	66	130
GM834200	20.0	20	76	140
GM834250	25.0	25	92	180

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○		◎	○

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM876, GM813 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

NORMAL SPEED

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.2D	Vc	55	85	100	125	140	150	160	180	200	225	245	270	290
				fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.06	0.09	0.12	0.15	0.18	0.2
				RPM	17507	18038	15915	15915	14854	11937	10186	9549	7958	7162	6499	5371	4615
				FEED	280	397	828	828	772	836	917	1146	1432	1719	1950	1934	1846
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	5		0.2D	Vc	45	65	75	95	105	120	130	145	160	180	195	215	230
				fz	0.008	0.011	0.023	0.023	0.023	0.032	0.040	0.060	0.080	0.100	0.120	0.140	0.160
				RPM	14324	13793	11937	12096	11141	9549	8276	7692	6366	5730	5173	4277	3661
				FEED	229	303	549	556	512	611	662	923	1019	1146	1241	1198	1171
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	6-7	Low alloy steel	0.2D	Vc	55	85	100	125	140	150	160	180	200	225	245	270	290
				fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.06	0.09	0.12	0.15	0.18	0.2
				RPM	17507	18038	15915	15915	14854	11937	10186	9549	7958	7162	6499	5371	4615
				FEED	280	397	828	828	772	836	917	1146	1432	1719	1950	1934	1846
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	8-9		0.2D	Vc	45	65	75	95	105	120	130	145	160	180	195	215	230
				fz	0.008	0.011	0.023	0.023	0.023	0.032	0.040	0.060	0.080	0.100	0.120	0.140	0.160
				RPM	14324	13793	11937	12096	11141	9549	8276	7692	6366	5730	5173	4277	3661
				FEED	229	303	549	556	512	611	662	923	1019	1146	1241	1198	1171
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	10	High alloyed steel, and tool steel	0.2D	Vc	55	85	100	125	140	150	160	180	200	225	245	270	290
				fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.06	0.09	0.12	0.15	0.18	0.2
				RPM	17507	18038	15915	15915	14854	11937	10186	9549	7958	7162	6499	5371	4615
				FEED	280	397	828	828	772	836	917	1146	1432	1719	1950	1934	1846
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	11.1 - 11.2		0.2D	Vc	45	65	75	95	105	120	130	145	160	180	195	215	230
				fz	0.008	0.011	0.023	0.023	0.023	0.032	0.040	0.060	0.080	0.100	0.120	0.140	0.160
				RPM	14324	13793	11937	12096	11141	9549	8276	7692	6366	5730	5173	4277	3661
				FEED	229	303	549	556	512	611	662	923	1019	1146	1241	1198	1171
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.2D	Vc	55	80	100	125	135	145	160	180	200	220	245	265	290
				fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.06	0.09	0.12	0.15	0.181	0.201
				RPM	17507	16977	15915	15915	14324	11539	10186	9549	7958	7003	6499	5272	4615
				FEED	280	373	828	828	745	808	917	1146	1432	1681	1950	1908	1855
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
H	38.1 - 38.2	Hardened steel	0.1D	Vc	20	30	35	40	50	60	65	65	70	70	75	75	80
				fz	0.008	0.011	0.016	0.016	0.017	0.021	0.024	0.030	0.044	0.055	0.070	0.091	0.113
				RPM	6366	6366	5570	5093	5305	4775	4138	3448	2785	2228	1989	1492	1273
				FEED	102	140	178	163	180	201	199	207	245	245	279	272	288
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	40	Chilled Cast Iron	0.2D	Vc	45	65	75	95	105	120	130	145	160	180	195	215	230
				fz	0.008	0.011	0.023	0.023	0.023	0.032	0.040	0.060	0.080	0.100	0.120	0.140	0.160
				RPM	14324	13793	11937	12096	11141	9549	8276	7692	6366	5730	5173	4277	3661
				FEED	229	303	549	556	512	611	662	923	1019	1146	1241	1198	1171
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	41	Hardened Cast Iron	0.1D	Vc	20	30	35	40	50	60	65	65	70	70	75	75	80
				fz	0.008	0.011	0.016	0.016	0.017	0.021	0.024	0.030	0.044	0.055	0.070	0.091	0.113
				RPM	6366	6366	5570	5093	5305	4775	4138	3448	2785	2228	1989	1492	1273
				FEED	102	140	178	163	180	201	199	207	245	245	279	272	288
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3

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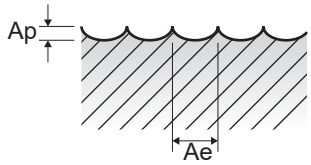

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM886 SERIES — 2 FLUTE BALL NOSE RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.5	0.6	0.8	1.0	1.2	1.4
P	1-4	Non-alloy steel	Vc	49~63	58~75	78~101	91~115	90~115	92~114
			fz	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010	0.005~0.013	0.006~0.015
			RPM	32550~42000	32550~42000	32550~42000	30450~38330	25200~32030	22050~27300
			FEED	185~515	235~660	235~660	265~735	265~820	265~820
			Ap	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125
	5		Vc	35~45	42~54	57~72	64~82	64~81	66~79
			fz	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.004~0.011
			RPM	23630~29930	23630~29930	23630~29930	21530~27300	17850~22580	15750~18900
			FEED	90~285	115~370	115~370	130~410	130~410	130~410
			Ap	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125
	6-7	Low alloy steel	Vc	49~63	58~75	78~101	91~115	90~115	92~114
			fz	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010	0.005~0.013	0.006~0.015
			RPM	32550~42000	32550~42000	32550~42000	30450~38330	25200~32030	22050~27300
			FEED	185~515	235~660	235~660	265~735	265~820	265~820
			Ap	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125
	8-9		Vc	35~45	42~54	57~72	64~82	64~81	66~79
			fz	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.004~0.011
			RPM	23630~29930	23630~29930	23630~29930	21530~27300	17850~22580	15750~18900
			FEED	90~285	115~370	115~370	130~410	130~410	130~410
			Ap	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125
	10	High alloyed steel, and tool steel	Vc	49~63	58~75	78~101	91~115	90~115	92~114
			fz	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010	0.005~0.013	0.006~0.015
			RPM	32550~42000	32550~42000	32550~42000	30450~38330	25200~32030	22050~27300
			FEED	185~515	235~660	235~660	265~735	265~820	265~820
			Ap	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125
	11.1 - 11.2		Vc	35~45	42~54	57~72	64~82	64~81	66~79
			fz	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.004~0.011
			RPM	23630~29930	23630~29930	23630~29930	21530~27300	17850~22580	15750~18900
			FEED	90~285	115~370	115~370	130~410	130~410	130~410
			Ap	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	49~63	58~75	78~101	91~115	90~115	92~114
			fz	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010	0.005~0.013	0.006~0.015
			RPM	32550~42000	32550~42000	32550~42000	30450~38330	25200~32030	22050~27300
			FEED	185~515	235~660	235~660	265~735	265~820	265~820
			Ap	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125
H	38.1 - 38.2	Hardened steel	Vc	22~28	27~34	36~45	41~51	41~52	41~51
			fz	0.003~0.005	0.004~0.006	0.004~0.006	0.005~0.008	0.006~0.009	0.007~0.011
			RPM	15020~18900	15020~18900	15020~18900	13650~17120	11340~14390	9870~12290
			FEED	90~185	115~235	115~235	130~265	130~265	130~265
			Ap	0.005~0.009	0.005~0.011	0.007~0.014	0.009~0.018	0.010~0.022	0.012~0.025
	40	Chilled Cast Iron	Vc	35~45	42~54	57~72	64~82	64~81	66~79
			fz	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.008	0.004~0.009	0.004~0.011
			RPM	23630~29930	23630~29930	23630~29930	21530~27300	17850~22580	15750~18900
			FEED	90~285	115~370	115~370	130~410	130~410	130~410
			Ap	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090	0.055~0.100	0.062~0.125
	41	Hardened Cast Iron	Vc	22~28	27~34	36~45	41~51	41~52	41~51
			fz	0.003~0.005	0.004~0.006	0.004~0.006	0.005~0.008	0.006~0.009	0.007~0.011
			RPM	15020~18900	15020~18900	15020~18900	13650~17120	11340~14390	9870~12290
			FEED	90~185	115~235	115~235	130~265	130~265	130~265
			Ap	0.005~0.009	0.005~0.011	0.007~0.014	0.009~0.018	0.010~0.022	0.012~0.025

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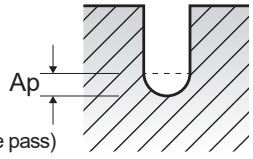

(Depth of cut per one pass)

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM902 SERIES — 2 FLUTE BALL NOSE with TAPER NECK

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

NORMAL SPEED

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1.0	2.0	3.0	4.0	5.0	6.0	8.0
	5	Non-alloy steel	0.2D	Vc	35	60	80	90	95	110	120
				fz	0.008	0.014	0.023	0.031	0.040	0.060	0.080
				RPM	11141	9549	8488	7162	6048	5836	4775
				FEED	178	267	390	444	484	700	764
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	8-9	Low alloy steel	0.2D	Vc	35	60	80	90	95	110	120
				fz	0.008	0.014	0.023	0.031	0.040	0.060	0.080
				RPM	11141	9549	8488	7162	6048	5836	4775
				FEED	178	267	390	444	484	700	764
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	11.1	High alloyed steel, and tool steel	0.2D	Vc	35	60	80	90	95	110	120
				fz	0.008	0.014	0.023	0.031	0.040	0.060	0.080
				RPM	11141	9549	8488	7162	6048	5836	4775
				FEED	178	267	390	444	484	700	764
				Ap	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	11.2		0.1D	Vc	55	75	100	110	125	135	150
				fz	0.012	0.028	0.043	0.052	0.059	0.067	0.075
				RPM	17507	11937	10610	8754	7958	7162	5968
				FEED	420	668	912	910	939	960	895
				Ap	0.05	0.1	0.15	0.2	0.25	0.25	0.25
H	38.1	Hardened steel	0.1D	Vc	55	75	100	110	125	135	150
				fz	0.012	0.028	0.043	0.052	0.059	0.067	0.075
				RPM	17507	11937	10610	8754	7958	7162	5968
				FEED	420	668	912	910	939	960	895
				Ap	0.05	0.1	0.15	0.2	0.25	0.25	0.25
	38.2		0.1D	Vc	55	75	95	110	125	130	140
				fz	0.012	0.026	0.043	0.052	0.059	0.068	0.075
				RPM	17507	11937	10080	8754	7958	6897	5570
				FEED	420	621	867	910	939	938	836
				Ap	0.05	0.1	0.15	0.2	0.25	0.25	0.25
	40	Chilled Cast Iron	0.1D	Vc	55	75	100	110	125	135	150
				fz	0.012	0.028	0.043	0.052	0.059	0.067	0.075
				RPM	17507	11937	10610	8754	7958	7162	5968
				FEED	420	668	912	910	939	960	895
				Ap	0.05	0.1	0.15	0.2	0.25	0.25	0.25
	41	Hardened Cast Iron	0.1D	Vc	55	75	95	110	125	130	140
				fz	0.012	0.026	0.043	0.052	0.059	0.068	0.075
				RPM	17507	11937	10080	8754	7958	6897	5570
				FEED	420	621	867	910	939	938	836
				Ap	0.05	0.1	0.15	0.2	0.25	0.25	0.25

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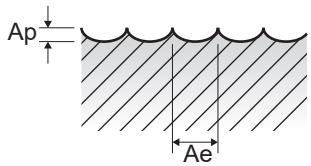

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM815 SERIES — **4 FLUTE BALL NOSE**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

NORMAL SPEED

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
P	1-4	Non-alloy steel	0.2D	Vc	105	130	140	150	170	190	210	230	250
				fz	0.013	0.019	0.026	0.034	0.045	0.068	0.09	0.111	0.136
				RPM	16711	13793	11141	9549	9019	7560	6685	6101	4974
				FEED	869	1048	1159	1299	1623	2056	2406	2709	2706
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	5		0.2D	Vc	75	100	110	120	135	150	170	185	200
				fz	0.010	0.017	0.024	0.030	0.045	0.060	0.075	0.089	0.106
				RPM	11937	10610	8754	7639	7162	5968	5411	4907	3979
				FEED	477	722	840	917	1289	1432	1623	1747	1687
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	6-7	Low alloy steel	0.2D	Vc	105	130	140	150	170	190	210	230	250
				fz	0.013	0.019	0.026	0.034	0.045	0.068	0.09	0.111	0.136
				RPM	16711	13793	11141	9549	9019	7560	6685	6101	4974
				FEED	869	1048	1159	1299	1623	2056	2406	2709	2706
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	8-9		0.2D	Vc	75	100	110	120	135	150	170	185	200
				fz	0.010	0.017	0.024	0.030	0.045	0.060	0.075	0.089	0.106
				RPM	11937	10610	8754	7639	7162	5968	5411	4907	3979
				FEED	477	722	840	917	1289	1432	1623	1747	1687
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	10	High alloyed steel, and tool steel	0.2D	Vc	105	130	140	150	170	190	210	230	250
				fz	0.013	0.019	0.026	0.034	0.045	0.068	0.09	0.111	0.136
				RPM	16711	13793	11141	9549	9019	7560	6685	6101	4974
				FEED	869	1048	1159	1299	1623	2056	2406	2709	2706
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	11.1 - 11.2		0.2D	Vc	75	100	110	120	135	150	170	185	200
				fz	0.010	0.017	0.024	0.030	0.045	0.060	0.075	0.089	0.106
				RPM	11937	10610	8754	7639	7162	5968	5411	4907	3979
				FEED	477	722	840	917	1289	1432	1623	1747	1687
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.2D	Vc	105	130	140	150	170	190	210	230	250
				fz	0.013	0.019	0.026	0.034	0.045	0.068	0.09	0.111	0.136
				RPM	16711	13793	11141	9549	9019	7560	6685	6101	4974
				FEED	869	1048	1159	1299	1623	2056	2406	2709	2706
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
H	38.1 - 39.2	Hardened steel	0.1D	Vc	30	45	55	60	65	65	65	70	70
				fz	0.008	0.012	0.016	0.018	0.022	0.033	0.041	0.053	0.069
				RPM	4775	4775	4377	3820	3448	2586	2069	1857	1393
				FEED	153	229	280	275	303	341	339	394	384
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	40	Chilled Cast Iron	0.2D	Vc	75	100	110	120	135	150	170	185	200
				fz	0.01	0.017	0.024	0.03	0.045	0.06	0.075	0.089	0.106
				RPM	11937	10610	8754	7639	7162	5968	5411	4907	3979
				FEED	477	722	840	917	1289	1432	1623	1747	1687
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	41	Hardened Cast Iron	0.1D	Vc	30	45	55	60	65	65	65	70	70
				fz	0.008	0.012	0.016	0.018	0.022	0.033	0.041	0.053	0.069
				RPM	4775	4775	4377	3820	3448	2586	2069	1857	1393
				FEED	153	229	280	275	303	341	339	394	384
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3

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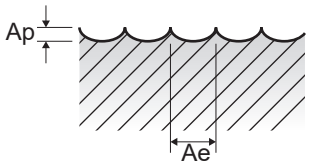


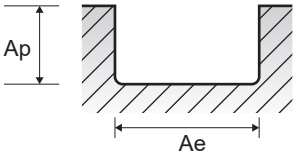
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM818 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 4.0	5.0	6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	1.0D	0.3D	Vc	75	80	80	85	85	85
					fz	0.016	0.023	0.032	0.045	0.053	0.051
					RPM	5968	5093	4244	3382	2706	2255
					FEED	191	234	272	304	287	230
	5		1.0D	0.3D	Vc	45	50	50	55	55	60
					fz	0.013	0.017	0.025	0.033	0.039	0.041
					RPM	3581	3183	2653	2188	1751	1592
					FEED	93	108	133	144	137	131
	6-7	Low alloy steel	1.0D	0.3D	Vc	75	80	80	85	85	85
					fz	0.016	0.023	0.032	0.045	0.053	0.051
					RPM	5968	5093	4244	3382	2706	2255
					FEED	191	234	272	304	287	230
	8-9		1.0D	0.3D	Vc	45	50	50	55	55	60
					fz	0.013	0.017	0.025	0.033	0.039	0.041
					RPM	3581	3183	2653	2188	1751	1592
					FEED	93	108	133	144	137	131
	10	High alloyed steel, and tool steel	1.0D	0.3D	Vc	75	80	80	85	85	85
					fz	0.016	0.023	0.032	0.045	0.053	0.051
					RPM	5968	5093	4244	3382	2706	2255
					FEED	191	234	272	304	287	230
	11.1 - 11.2		1.0D	0.3D	Vc	45	50	50	55	55	60
					fz	0.013	0.017	0.025	0.033	0.039	0.041
					RPM	3581	3183	2653	2188	1751	1592
					FEED	93	108	133	144	137	131
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D	Vc	75	80	80	85	85	85
					fz	0.016	0.023	0.032	0.045	0.053	0.051
					RPM	5968	5093	4244	3382	2706	2255
					FEED	191	234	272	304	287	230
H	38.1 - 38.2	Hardened steel	1.0D	0.3D	Vc	30	35	35	35	35	35
					fz	0.006	0.008	0.010	0.013	0.016	0.019
					RPM	2387	2228	1857	1393	1114	928
					FEED	29	36	37	36	36	35
	40	Chilled Cast Iron	1.0D	0.3D	Vc	45	50	50	55	55	60
					fz	0.013	0.017	0.025	0.033	0.039	0.041
					RPM	3581	3183	2653	2188	1751	1592
					FEED	93	108	133	144	137	131
	41	Hardened Cast Iron	1.0D	0.3D	Vc	30	35	35	35	35	35
					fz	0.006	0.008	0.01	0.013	0.016	0.019
					RPM	2387	2228	1857	1393	1114	928
					FEED	29	36	37	36	36	35



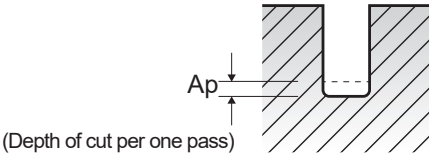
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM8A1 SERIES — 2 FLUTE CORNER RADIUS RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 2.0	2.5	3.0	4.0	5.0	6.0
P	1-4	Non-alloy steel	Vc	75~91	75~94	75~94	75~94	75~94	75~94
			fz	0.012~0.031	0.015~0.038	0.018~0.045	0.023~0.060	0.029~0.075	0.035~0.090
			RPM	12600~15230	9980~12600	8400~10500	6300~7880	5040~6300	4200~5250
			FEED	295~945	295~945	295~945	295~945	295~945	295~945
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	5		Vc	52~66	53~67	52~66	52~67	52~66	53~66
			fz	0.011~0.029	0.014~0.035	0.017~0.043	0.023~0.057	0.029~0.071	0.034~0.086
			RPM	8720~11030	7040~8930	5780~7350	4310~5570	3470~4410	2940~3680
			FEED	200~630	200~630	200~630	200~630	200~630	200~630
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	6-7	Low alloy steel	Vc	75~91	75~94	75~94	75~94	75~94	75~94
			fz	0.012~0.031	0.015~0.038	0.018~0.045	0.023~0.060	0.029~0.075	0.035~0.090
			RPM	12600~15230	9980~12600	8400~10500	6300~7880	5040~6300	4200~5250
			FEED	295~945	295~945	295~945	295~945	295~945	295~945
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	8-9		Vc	52~66	53~67	52~66	52~67	52~66	53~66
			fz	0.011~0.029	0.014~0.035	0.017~0.043	0.023~0.057	0.029~0.071	0.034~0.086
			RPM	8720~11030	7040~8930	5780~7350	4310~5570	3470~4410	2940~3680
			FEED	200~630	200~630	200~630	200~630	200~630	200~630
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	10	High alloyed steel, and tool steel	Vc	75~91	75~94	75~94	75~94	75~94	75~94
			fz	0.012~0.031	0.015~0.038	0.018~0.045	0.023~0.060	0.029~0.075	0.035~0.090
			RPM	12600~15230	9980~12600	8400~10500	6300~7880	5040~6300	4200~5250
			FEED	295~945	295~945	295~945	295~945	295~945	295~945
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	11.1 - 11.2		Vc	52~66	53~67	52~66	52~67	52~66	53~66
			fz	0.011~0.029	0.014~0.035	0.017~0.043	0.023~0.057	0.029~0.071	0.034~0.086
			RPM	8720~11030	7040~8930	5780~7350	4310~5570	3470~4410	2940~3680
			FEED	200~630	200~630	200~630	200~630	200~630	200~630
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	75~91	75~94	75~94	75~94	75~94	75~94
			fz	0.012~0.031	0.015~0.038	0.018~0.045	0.023~0.060	0.029~0.075	0.035~0.090
			RPM	12600~15230	9980~12600	8400~10500	6300~7880	5040~6300	4200~5250
			FEED	295~945	295~945	295~945	295~945	295~945	295~945
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
H	38.1 - 38.2	Hardened steel	Vc	33~41	34~42	33~41	33~41	33~41	33~49
			fz	0.006~0.010	0.008~0.012	0.009~0.015	0.013~0.020	0.015~0.025	0.019~0.025
			RPM	5570~6930	4520~5570	3680~4620	2730~3470	2210~2730	1840~2730
			FEED	70~135	70~135	70~135	70~135	70~135	70~135
			Ap	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108
	40	Chilled Cast Iron	Vc	52~66	53~67	52~66	52~67	52~66	53~66
			fz	0.011~0.029	0.014~0.035	0.017~0.043	0.023~0.057	0.029~0.071	0.034~0.086
			RPM	8720~11030	7040~8930	5780~7350	4310~5570	3470~4410	2940~3680
			FEED	200~630	200~630	200~630	200~630	200~630	200~630
			Ap	0.090~0.180	0.112~0.235	0.135~0.270	0.180~0.360	0.225~0.450	0.270~0.540
	41	Hardened Cast Iron	Vc	33~41	34~42	33~41	33~41	33~41	33~49
			fz	0.006~0.010	0.008~0.012	0.009~0.015	0.013~0.020	0.015~0.025	0.019~0.025
			RPM	5570~6930	4520~5570	3680~4620	2730~3470	2210~2730	1840~2730
			FEED	70~135	70~135	70~135	70~135	70~135	70~135
			Ap	0.018~0.035	0.022~0.045	0.028~0.055	0.036~0.072	0.045~0.090	0.054~0.108



(Depth of cut per one pass)

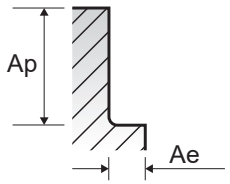
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM819 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.05D	2.5D	Vc	70	75	80	80	85	85	85	95	85
					fz	0.006	0.01	0.012	0.014	0.019	0.023	0.022	0.023	0.022
					RPM	7427	5968	5093	4244	3382	2706	2255	1890	1353
					FEED	178	239	244	238	257	249	198	174	119
	5		0.05D	2.5D	Vc	45	45	50	50	55	55	60	60	55
					fz	0.008	0.011	0.016	0.018	0.024	0.028	0.029	0.030	0.028
					RPM	4775	3581	3183	2653	2188	1751	1592	1194	875
					FEED	153	158	204	191	210	196	185	143	98
	6-7	Low alloy steel	0.05D	2.5D	Vc	70	75	80	80	85	85	85	95	85
					fz	0.006	0.01	0.012	0.014	0.019	0.023	0.022	0.023	0.022
					RPM	7427	5968	5093	4244	3382	2706	2255	1890	1353
					FEED	178	239	244	238	257	249	198	174	119
	8-9		0.05D	2.5D	Vc	45	45	50	50	55	55	60	60	55
					fz	0.008	0.011	0.016	0.018	0.024	0.028	0.029	0.030	0.028
					RPM	4775	3581	3183	2653	2188	1751	1592	1194	875
					FEED	153	158	204	191	210	196	185	143	98
	10	High alloyed steel, and tool steel	0.05D	2.5D	Vc	70	75	80	80	85	85	85	95	85
					fz	0.006	0.01	0.012	0.014	0.019	0.023	0.022	0.023	0.022
					RPM	7427	5968	5093	4244	3382	2706	2255	1890	1353
					FEED	178	239	244	238	257	249	198	174	119
	11.1 - 11.2		0.05D	2.5D	Vc	45	45	50	50	55	55	60	60	55
					fz	0.008	0.011	0.016	0.018	0.024	0.028	0.029	0.030	0.028
					RPM	4775	3581	3183	2653	2188	1751	1592	1194	875
					FEED	153	158	204	191	210	196	185	143	98
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	Vc	70	75	80	80	85	85	85	95	85
					fz	0.006	0.01	0.012	0.014	0.019	0.023	0.022	0.023	0.022
					RPM	7427	5968	5093	4244	3382	2706	2255	1890	1353
					FEED	178	239	244	238	257	249	198	174	119
H	38.1 - 38.2	Hardened steel	0.02D	2.0D	Vc	25	30	35	35	35	35	35	35	35
					fz	0.006	0.008	0.011	0.013	0.017	0.021	0.020	0.022	0.023
					RPM	2653	2387	2228	1857	1393	1114	928	696	557
					FEED	64	76	98	97	95	94	74	61	51
	40	Chilled Cast Iron	0.05D	2.5D	Vc	45	45	50	50	55	55	60	60	55
					fz	0.008	0.011	0.016	0.018	0.024	0.028	0.029	0.030	0.028
					RPM	4775	3581	3183	2653	2188	1751	1592	1194	875
					FEED	153	158	204	191	210	196	185	143	98
	41	Hardened Cast Iron	0.02D	2.0D	Vc	25	30	35	35	35	35	35	35	35
					fz	0.006	0.008	0.011	0.013	0.017	0.021	0.020	0.022	0.023
					RPM	2653	2387	2228	1857	1393	1114	928	696	557
					FEED	64	76	98	97	95	94	74	61	51



X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM883 SERIES — 2 FLUTE RIB PROCESSING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2
P	1-4	Non-alloy steel	Vc	39~50	49~63	58~75	68~88	68~88	71~89	71~88	70~85
			fz	0.003~0.006	0.003~0.006	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.011	0.006~0.014	0.008~0.020
			RPM	32550~42000	32550~42000	32550~42000	32550~42000	28350~36750	26250~33080	23630~29400	19430~23630
			FEED	210~460	210~460	265~600	265~600	295~660	295~755	295~850	295~945
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	5		Vc	28~35	35~44	42~53	49~62	49~62	49~64	49~63	49~62
			fz	0.002~0.006	0.002~0.006	0.002~0.008	0.002~0.008	0.003~0.010	0.005~0.012	0.006~0.015	0.007~0.018
			RPM	23630~29400	23630~29400	23630~29400	23630~29400	20480~25730	18380~23630	16490~21000	13650~17330
			FEED	90~355	90~355	115~450	115~450	125~505	170~565	200~630	200~630
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	6-7	Low alloy steel	Vc	39~50	49~63	58~75	68~88	68~88	71~89	71~88	70~85
			fz	0.003~0.006	0.003~0.006	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.011	0.006~0.014	0.008~0.020
			RPM	32550~42000	32550~42000	32550~42000	32550~42000	28350~36750	26250~33080	23630~29400	19430~23630
			FEED	210~460	210~460	265~600	265~600	295~660	295~755	295~850	295~945
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	8-9		Vc	28~35	35~44	42~53	49~62	49~62	49~64	49~63	49~62
			fz	0.002~0.006	0.002~0.006	0.002~0.008	0.002~0.008	0.003~0.010	0.005~0.012	0.006~0.015	0.007~0.018
			RPM	23630~29400	23630~29400	23630~29400	23630~29400	20480~25730	18380~23630	16490~21000	13650~17330
			FEED	90~355	90~355	115~450	115~450	125~505	170~565	200~630	200~630
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	10	High alloyed steel, and tool steel	Vc	39~50	49~63	58~75	68~88	68~88	71~89	71~88	70~85
			fz	0.003~0.006	0.003~0.006	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.011	0.006~0.014	0.008~0.020
			RPM	32550~42000	32550~42000	32550~42000	32550~42000	28350~36750	26250~33080	23630~29400	19430~23630
			FEED	210~460	210~460	265~600	265~600	295~660	295~755	295~850	295~945
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	11.1 - 11.2		Vc	28~35	35~44	42~53	49~62	49~62	49~64	49~63	49~62
			fz	0.002~0.006	0.002~0.006	0.002~0.008	0.002~0.008	0.003~0.010	0.005~0.012	0.006~0.015	0.007~0.018
			RPM	23630~29400	23630~29400	23630~29400	23630~29400	20480~25730	18380~23630	16490~21000	13650~17330
			FEED	90~355	90~355	115~450	115~450	125~505	170~565	200~630	200~630
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	Vc	39~50	49~63	58~75	68~88	68~88	71~89	71~88	70~85
			fz	0.003~0.006	0.003~0.006	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.011	0.006~0.014	0.008~0.020
			RPM	32550~42000	32550~42000	32550~42000	32550~42000	28350~36750	26250~33080	23630~29400	19430~23630
			FEED	210~460	210~460	265~600	265~600	295~660	295~755	295~850	295~945
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
H	38.1 - 38.2	Hardened steel	Vc	18~21	22~27	27~32	31~37	31~37	31~35	31~39	31~40
			fz	0.001~0.003	0.001~0.003	0.001~0.003	0.001~0.003	0.002~0.004	0.003~0.005	0.003~0.005	0.004~0.006
			RPM	15020~17850	15020~17850	15020~17850	15020~17850	13130~15540	11550~13130	10500~13130	8720~11030
			FEED	30~95	30~95	40~115	40~115	45~130	60~135	70~135	70~135
			Ap	0.004~0.008	0.004~0.009	0.005~0.011	0.006~0.013	0.007~0.015	0.008~0.016	0.009~0.018	0.010~0.022
	40	Chilled Cast Iron	Vc	28~35	35~44	42~53	49~62	49~62	49~64	49~63	49~62
			fz	0.002~0.006	0.002~0.006	0.002~0.008	0.002~0.008	0.003~0.010	0.005~0.012	0.006~0.015	0.007~0.018
			RPM	23630~29400	23630~29400	23630~29400	23630~29400	20480~25730	18380~23630	16490~21000	13650~17330
			FEED	90~355	90~355	115~450	115~450	125~505	170~565	200~630	200~630
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090	0.055~0.100
	41	Hardened Cast Iron	Vc	18~21	22~27	27~32	31~37	31~37	31~35	31~39	31~40
			fz	0.001~0.003	0.001~0.003	0.001~0.003	0.001~0.003	0.002~0.004	0.003~0.005	0.003~0.005	0.004~0.006
			RPM	15020~17850	15020~17850	15020~17850	15020~17850	13130~15540	11550~13130	10500~13130	8720~11030
			FEED	30~95	30~95	40~115	40~115	45~130	60~135	70~135	70~135
			Ap	0.004~0.008	0.004~0.009	0.005~0.011	0.006~0.013	0.007~0.015	0.008~0.016	0.009~0.018	0.010~0.022

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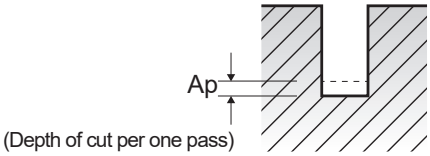


X-POWER PRO END MILLS

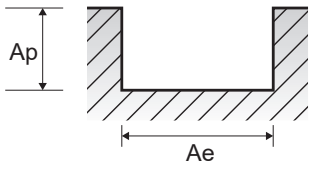
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM895 SERIES — **3 FLUTE - SLOTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
P	1-4	Non-alloy steel	1.0D	D≤3:0.2D D>3:0.5D	Vc	80	90	105	110	115	115	115	115	120
					fz	0.005	0.007	0.012	0.015	0.019	0.027	0.031	0.03	0.03
					RPM	12732	9549	8356	7003	6101	4576	3661	3050	2387
					FEED	191	201	301	315	348	371	340	275	215
	5		1.0D	D≤3:0.2D D>3:0.5D	Vc	50	60	65	65	70	70	70	70	75
					fz	0.005	0.008	0.011	0.015	0.020	0.024	0.023	0.023	0.024
					RPM	7958	6366	5173	4138	3714	2785	2228	1857	1492
					FEED	119	153	171	186	223	201	154	128	107
	6-7	Low alloy steel	1.0D	D≤3:0.2D D>3:0.5D	Vc	80	90	105	110	115	115	115	115	120
					fz	0.005	0.007	0.012	0.015	0.019	0.027	0.031	0.03	0.03
					RPM	12732	9549	8356	7003	6101	4576	3661	3050	2387
					FEED	191	201	301	315	348	371	340	275	215
	8-9		1.0D	D≤3:0.2D D>3:0.5D	Vc	50	60	65	65	70	70	70	70	75
					fz	0.005	0.008	0.011	0.015	0.020	0.024	0.023	0.023	0.024
					RPM	7958	6366	5173	4138	3714	2785	2228	1857	1492
					FEED	119	153	171	186	223	201	154	128	107
	10	High alloyed steel, and tool steel	1.0D	D≤3:0.2D D>3:0.5D	Vc	80	90	105	110	115	115	115	115	120
					fz	0.005	0.007	0.012	0.015	0.019	0.027	0.031	0.03	0.03
					RPM	12732	9549	8356	7003	6101	4576	3661	3050	2387
					FEED	191	201	301	315	348	371	340	275	215
	11.1 - 11.2		1.0D	D≤3:0.2D D>3:0.5D	Vc	50	60	65	65	70	70	70	70	75
					fz	0.005	0.008	0.011	0.015	0.020	0.024	0.023	0.023	0.024
					RPM	7958	6366	5173	4138	3714	2785	2228	1857	1492
					FEED	119	153	171	186	223	201	154	128	107
M	14.1	Stainless steel	1.0D	D≤3:0.2D D>3:0.5D	Vc	45	50	55	55	60	60	60	55	60
					fz	0.004	0.008	0.011	0.015	0.019	0.025	0.029	0.029	0.031
					RPM	7162	5305	4377	3501	3183	2387	1910	1459	1194
					FEED	86	127	144	158	181	179	166	127	111
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	D≤3:0.2D D>3:0.5D	Vc	80	90	105	110	115	115	115	115	120
					fz	0.005	0.007	0.012	0.015	0.019	0.027	0.031	0.03	0.03
					RPM	12732	9549	8356	7003	6101	4576	3661	3050	2387
					FEED	191	201	301	315	348	371	340	275	215
H	38.1 - 38.2	Hardened steel	1.0D	0.05D	Vc	35	35	40	40	40	45	45	50	50
					fz	0.002	0.004	0.004	0.007	0.008	0.013	0.013	0.014	0.013
					RPM	5570	3714	3183	2546	2122	1790	1432	1326	995
					FEED	33	45	38	53	51	70	56	56	39
	40	Chilled Cast Iron	1.0D	D≤3:0.2D D>3:0.5D	Vc	50	60	65	65	70	70	70	70	75
					fz	0.005	0.008	0.011	0.015	0.020	0.024	0.023	0.023	0.024
					RPM	7958	6366	5173	4138	3714	2785	2228	1857	1492
					FEED	119	153	171	186	223	201	154	128	107
	41	Hardened Cast Iron	1.0D	0.05D	Vc	35	35	40	40	40	45	45	50	50
					fz	0.002	0.004	0.004	0.007	0.008	0.013	0.013	0.014	0.013
					RPM	5570	3714	3183	2546	2122	1790	1432	1326	995
					FEED	33	45	38	53	51	70	56	56	39

▶ NEXT PAGE



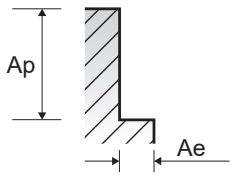
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM811 SERIES — **4 FLUTE - SIDE CUTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

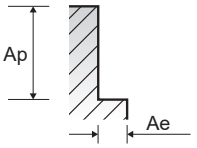
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.05D	1.0D	Vc	80	95	105	110	115	120	115	115	125	120	120
					fz	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048	0.046
					RPM	12732	10080	8356	7003	6101	4775	3661	3050	2487	1910	1528
					FEED	306	363	635	672	732	802	688	573	468	367	281
	5		0.05D	1.0D	Vc	55	60	65	65	70	70	70	70	75	75	75
					fz	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.037	0.037	0.038	0.039
					RPM	8754	6366	5173	4138	3714	2785	2228	1857	1492	1194	955
					FEED	210	229	393	397	460	423	330	275	221	181	149
	6-7	Low alloy steel	0.05D	1.0D	Vc	80	95	105	110	115	120	115	115	125	120	120
					fz	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048	0.046
					RPM	12732	10080	8356	7003	6101	4775	3661	3050	2487	1910	1528
					FEED	306	363	635	672	732	802	688	573	468	367	281
	8-9		0.05D	1.0D	Vc	55	60	65	65	70	70	70	70	75	75	75
					fz	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.037	0.037	0.038	0.039
					RPM	8754	6366	5173	4138	3714	2785	2228	1857	1492	1194	955
					FEED	210	229	393	397	460	423	330	275	221	181	149
	10	High alloyed steel, and tool steel	0.05D	1.0D	Vc	80	95	105	110	115	120	115	115	125	120	120
					fz	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048	0.046
					RPM	12732	10080	8356	7003	6101	4775	3661	3050	2487	1910	1528
					FEED	306	363	635	672	732	802	688	573	468	367	281
	11.1 - 11.2		0.05D	1.0D	Vc	55	60	65	65	70	70	70	70	75	75	75
					fz	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.037	0.037	0.038	0.039
					RPM	8754	6366	5173	4138	3714	2785	2228	1857	1492	1194	955
					FEED	210	229	393	397	460	423	330	275	221	181	149
M	14.1	Stainless steel	0.05D	1.0D	Vc	45	50	55	55	60	60	60	55	60	60	60
					fz	0.005	0.009	0.018	0.024	0.029	0.041	0.045	0.044	0.046	0.045	0.044
					RPM	7162	5305	4377	3501	3183	2387	1910	1459	1194	955	764
					FEED	143	191	315	336	369	392	344	257	220	172	134
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	Vc	80	95	105	110	115	120	115	115	125	120	120
					fz	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048	0.046
					RPM	12732	10080	8356	7003	6101	4775	3661	3050	2487	1910	1528
					FEED	306	363	635	672	732	802	688	573	468	367	281
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	35	35	40	40	40	45	50	50	50	50	45
					fz	0.002	0.004	0.005	0.008	0.010	0.017	0.016	0.017	0.016	0.015	0.015
					RPM	5570	3714	3183	2546	2122	1790	1592	1326	995	796	573
					FEED	45	59	64	81	85	122	102	90	64	48	34
	40	Chilled Cast Iron	0.05D	1.0D	Vc	55	60	65	65	70	70	70	70	75	75	75
					fz	0.006	0.009	0.019	0.024	0.031	0.038	0.037	0.037	0.037	0.038	0.039
					RPM	8754	6366	5173	4138	3714	2785	2228	1857	1492	1194	955
					FEED	210	229	393	397	460	423	330	275	221	181	149
	41	Hardened Cast Iron	0.05D	1.0D	Vc	35	35	40	40	40	45	50	50	50	50	45
					fz	0.002	0.004	0.005	0.008	0.010	0.017	0.016	0.017	0.016	0.015	0.015
					RPM	5570	3714	3183	2546	2122	1790	1592	1326	995	796	573
					FEED	45	59	64	81	85	122	102	90	64	48	34



X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM812 SERIES 6&8 FLUTE - SIDE CUTTING



Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

NORMAL SPEED

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.1D	1.5D	Vc	105	110	110	110	110	105
					fz	0.06	0.079	0.099	0.099	0.1	0.075
					RPM	5570	4377	3501	2918	2188	1671
					FEED	2005	2075	2080	1733	1313	1003
	5		0.05D	1.5D	Vc	75	75	75	75	75	75
					fz	0.059	0.078	0.098	0.097	0.099	0.075
					RPM	3979	2984	2387	1989	1492	1194
					FEED	1409	1397	1404	1158	886	716
	6-7	Low alloy steel	0.1D	1.5D	Vc	105	110	110	110	110	105
					fz	0.06	0.079	0.099	0.099	0.1	0.075
					RPM	5570	4377	3501	2918	2188	1671
					FEED	2005	2075	2080	1733	1313	1003
	8-9		0.05D	1.5D	Vc	75	75	75	75	75	75
					fz	0.059	0.078	0.098	0.097	0.099	0.075
					RPM	3979	2984	2387	1989	1492	1194
					FEED	1409	1397	1404	1158	886	716
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	105	110	110	110	110	105
					fz	0.06	0.079	0.099	0.099	0.1	0.075
					RPM	5570	4377	3501	2918	2188	1671
					FEED	2005	2075	2080	1733	1313	1003
	11.1 - 11.2		0.05D	1.5D	Vc	75	75	75	75	75	75
					fz	0.059	0.078	0.098	0.097	0.099	0.075
					RPM	3979	2984	2387	1989	1492	1194
					FEED	1409	1397	1404	1158	886	716
H	38.1	Hardened steel	0.05D	1.5D	Vc	75	75	75	75	75	75
					fz	0.059	0.078	0.098	0.097	0.099	0.075
					RPM	3979	2984	2387	1989	1492	1194
					FEED	1409	1397	1404	1158	886	716
	38.2		0.05D	1.0D	Vc	30	30	30	30	35	30
					fz	0.022	0.030	0.035	0.036	0.035	0.027
					RPM	1592	1194	955	796	696	477
					FEED	210	215	201	172	146	103
	40	Chilled Cast Iron	0.05D	1.5D	Vc	75	75	75	75	75	75
					fz	0.059	0.078	0.098	0.097	0.099	0.075
					RPM	3979	2984	2387	1989	1492	1194
					FEED	1409	1397	1404	1158	886	716
	41	Hardened Cast Iron	0.05D	1.0D	Vc	30	30	30	30	35	30
					fz	0.022	0.030	0.035	0.036	0.035	0.027
					RPM	1592	1194	955	796	696	477
					FEED	210	215	201	172	146	103

HIGH SPEED

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-5	Non-alloy steel	0.05D	1.5D	Vc	325	325	320	325	325	325
					fz	0.06	0.081	0.1	0.1	0.1	0.076
					RPM	17242	12931	10186	8621	6466	5173
					FEED	6207	6285	6112	5173	3879	3145
	6-9	Low alloy steel	0.05D	1.5D	Vc	325	325	320	325	325	325
					fz	0.06	0.081	0.1	0.1	0.1	0.076
					RPM	17242	12931	10186	8621	6466	5173
					FEED	6207	6285	6112	5173	3879	3145
	10 - 11.2	High alloyed steel, and tool steel	0.05D	1.5D	Vc	325	325	320	325	325	325
					fz	0.06	0.081	0.1	0.1	0.1	0.076
					RPM	17242	12931	10186	8621	6466	5173
					FEED	6207	6285	6112	5173	3879	3145
H	38.1	Hardened steel	0.05D	1.5D	Vc	325	325	320	325	325	325
					fz	0.060	0.081	0.100	0.100	0.100	0.076
					RPM	17242	12931	10186	8621	6466	5173
					FEED	6207	6285	6112	5173	3879	3145
	38.2		0.05D	1.0D	Vc	160	160	160	160	160	160
					fz	0.060	0.081	0.101	0.100	0.100	0.073
					RPM	8488	6366	5093	4244	3183	2546
					FEED	3056	3094	3086	2546	1910	1487
	40	Chilled Cast Iron	0.05D	1.5D	Vc	325	325	320	325	325	325
					fz	0.060	0.081	0.100	0.100	0.100	0.076
					RPM	17242	12931	10186	8621	6466	5173
					FEED	6207	6285	6112	5173	3879	3145
	41	Hardened Cast Iron	0.05D	1.0D	Vc	160	160	160	160	160	160
					fz	0.060	0.081	0.101	0.100	0.100	0.073
					RPM	8488	6366	5093	4244	3183	2546
					FEED	3056	3094	3086	2546	1910	1487

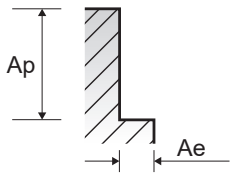
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GM814 SERIES — 3&4 FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.3D	1.5D	Vc	310	305	305	315	315	315
					fz	0.05	0.067	0.063	0.075	0.1	0.113
					RPM	16446	12136	9708	8356	6267	5013
					FEED	2467	2439	2447	2507	2507	2266
	5		0.3D	1.5D	Vc	245	245	250	240	255	240
					fz	0.023	0.030	0.028	0.033	0.040	0.039
					RPM	12998	9748	7958	6366	5073	3820
					FEED	897	877	891	840	812	596
	6-7	Low alloy steel	0.3D	1.5D	Vc	310	305	305	315	315	315
					fz	0.05	0.067	0.063	0.075	0.1	0.113
					RPM	16446	12136	9708	8356	6267	5013
					FEED	2467	2439	2447	2507	2507	2266
	8-9		0.3D	1.5D	Vc	245	245	250	240	255	240
					fz	0.023	0.030	0.028	0.033	0.040	0.039
					RPM	12998	9748	7958	6366	5073	3820
					FEED	897	877	891	840	812	596
	10	High alloyed steel, and tool steel	0.3D	1.5D	Vc	310	305	305	315	315	315
					fz	0.05	0.067	0.063	0.075	0.1	0.113
					RPM	16446	12136	9708	8356	6267	5013
					FEED	2467	2439	2447	2507	2507	2266
	11.1 - 11.2		0.3D	1.5D	Vc	245	245	250	240	255	240
					fz	0.023	0.030	0.028	0.033	0.040	0.039
					RPM	12998	9748	7958	6366	5073	3820
					FEED	897	877	891	840	812	596
M	14.1	Stainless steel	0.3D	1.5D	Vc	165	165	170	165	175	160
					fz	0.023	0.03	0.028	0.034	0.039	0.038
					RPM	8754	6565	5411	4377	3482	2546
					FEED	604	591	606	595	543	387
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.3D	1.5D	Vc	310	305	305	315	315	315
					fz	0.05	0.067	0.063	0.075	0.1	0.113
					RPM	16446	12136	9708	8356	6267	5013
					FEED	2467	2439	2447	2507	2507	2266
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	Vc	65	65	65	65	65	65
					fz	0.026	0.033	0.036	0.039	0.034	0.038
					RPM	3448	2586	2069	1724	1293	1035
					FEED	269	256	298	269	176	157
	40	Chilled Cast Iron	0.3D	1.5D	Vc	245	245	250	240	255	240
					fz	0.023	0.030	0.028	0.033	0.040	0.039
					RPM	12998	9748	7958	6366	5073	3820
					FEED	897	877	891	840	812	596
	41	Hardened Cast Iron	0.05D	1.0D	Vc	65	65	65	65	65	65
					fz	0.026	0.033	0.036	0.039	0.034	0.038
					RPM	3448	2586	2069	1724	1293	1035
					FEED	269	256	298	269	176	157



Leading Through Innovation

SOLID CARBIDE

TitaNox-POWER END MILLS

TitaNox-Power VHM - Schaftfräser

- High Speed Machining for Exotic Materials: Titanium and Stainless Steels
- Hochgeschwindigkeitsbearbeitung von Sonderwerkstoffen: Titan und rostfreie Stähle

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE

TitaNox-POWER END MILLS

High Speed Machining for Exotic Materials:
Titanium and Stainless Steels

SERIES	GMG40 GMG41	EMI94 EMI96	EMI93 EMI95	GMG28 GMG29
FLUTE	4	5	5	5
HELIX ANGLE	43°/45°	38°	38°	43°/44°/45°
CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	SQUARE	CORNER RADIUS
SIZE MIN	D6.0	D6.0	D6.0	D6.0
SIZE MAX	D25.0	D25.0	D25.0	D25.0
PAGE	C420	C422	C424	C425
	LONG LENGTH DOUBLE CORE	-	-	SHORT LENGTH
	Y-Coating	AlTiN		Y-Coating
		TitaNox-Power HPC		

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C431

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	○
	4		About 0.75% C	Annealed	270	28	○	○	○	○
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	○
	6	Low alloy steel		Annealed	180	10	○	○	○	○
	7			Quenched & Tempered	275	29	○	○	○	○
	8			Quenched & Tempered	300	32	○	○	○	○
	9			Quenched & Tempered	350	38	○	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○
	11			Quenched & Tempered	325	35	○	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○	○
	18		Pearlitic		250	25	○	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○	○
	20		Pearlitic		230	21	○	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○
	32			Cured	280	30	○	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○	○
	34			Cured	350	38	○	○	○	○
	35			Cast	320	34	○	○	○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		◎	◎	◎	◎
	37		Alpha + Beta Alloys	Hardened	1050 Rm		◎	◎	◎	◎
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

TitaNox-POWER END MILLS

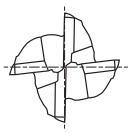
PLAIN SHANK **GMG40** SERIES
FLAT SHANK **GMG41** SERIES

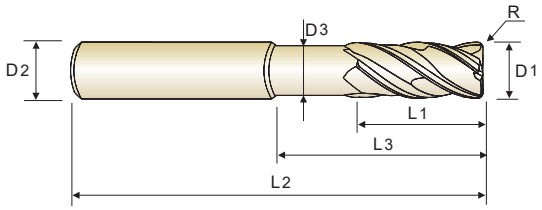
CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE

VOLLHARTMETALL, 4 SCHNEIDEN ECKRADIUS MIT DOPPELKERN
CARBURE, 4 DENTS, TORIQUE AVEC ÂME DOUBLE
FRESA IN MD, 4 TAGLIENTI, TORICA, DOUBLE CORE

- Double core end mill has a unique flute design for excellent chip evacuation and higher rigidity.
- The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy.

- Der Doppelkern hat ein einzigartiges Schneiden Design für eine exzellente Spanabfuhr und bessere Zähigkeit.
- Der Doppelkern erhöht die Stabilität und unterstützt den Spänefluss, reduziert die Werkzeugabdrängung, verbessert die Formstabilität und die Werkstückgenauigkeit.





CARBIDE | 4 | 43°/45° | PLAIN | FLAT | Y Coating

p.C431~C432

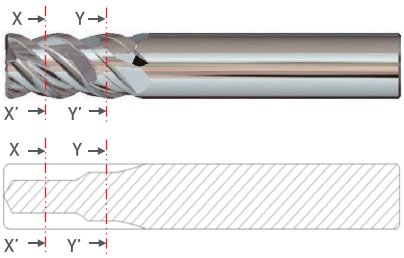
Unit : mm

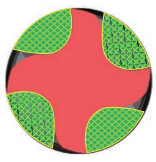
EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
PLAIN	FLAT	R	D_1	D_2	L_1	L_3	L_2	D_3
GMG40060	**GMG41060**	R0.5	**6.0**	6	13	20	57	5.5
GMG40901	**GMG41901**	R1.0	**6.0**	6	13	20	57	5.5
-	**GMG41080**	R0.5	**8.0**	8	19	25	63	7.5
GMG40902	**GMG41902**	R1.0	**8.0**	8	19	25	63	7.5
GMG40903	**GMG41903**	R1.5	**8.0**	8	19	25	63	7.5
GMG40904	**GMG41904**	R2.0	**8.0**	8	19	25	63	7.5
GMG40100	**GMG41100**	R0.5	**10.0**	10	22	30	72	9.2
GMG40905	**GMG41905**	R1.0	**10.0**	10	22	30	72	9.2
GMG40906	**GMG41906**	R1.5	**10.0**	10	22	30	72	9.2
GMG40907	**GMG41907**	R2.0	**10.0**	10	22	30	72	9.2
GMG40120	**GMG41120**	R0.5	**12.0**	12	26	35	83	11.0
GMG40908	**GMG41908**	R1.0	**12.0**	12	26	35	83	11.0
GMG40909	**GMG41909**	R1.5	**12.0**	12	26	35	83	11.0
GMG40910	**GMG41910**	R2.0	**12.0**	12	26	35	83	11.0
GMG40911	**GMG41911**	R3.0	**12.0**	12	26	35	83	11.0
GMG40140	**GMG41140**	R1.0	**14.0**	14	26	35	83	13.0
GMG40912	**GMG41912**	R2.0	**14.0**	14	26	35	83	13.0
GMG40160	**GMG41160**	R1.0	**16.0**	16	35	43	92	15.0

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

◆ 2 STEP CORE





<SECTION X-X'> EXCELLENT CHIP EVACUATION

<SECTION Y-Y'> HIGHER RIGIDITY

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

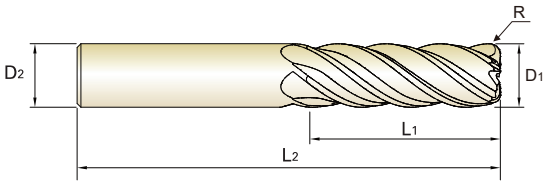
PLAIN SHANK **EMI94** SERIES
FLAT SHANK **EMI96** SERIES

CARBIDE, 5 FLUTE STANDARD LENGTH (TitaNox-Power HPC)

HARTMETALL, 5-SCHNEIDEN STANDARD LÄNGE (TITANOX-POWER HPC) HARTMETALL 5
FRAISE CARBURE, 5 DENTS, LONGUEUR STANDARD (TITANOX-POWER HPC)
FRESA MD, 5 TAGLIENTI, SERIE CORTA (TITANOX-POWER HPC)

- New design enhances chip space in heavy cuts, while still maintaining rigidity in peel milling.
- Unequal index design for Chatter-Free cutting.
- High performance milling of Stainless Steel, Titanium, and Heat-Resistant Super Alloys.

- Das neue Design verbessert den Spanraum bei schweren Schnitten, während die Steifigkeit beim Schälfräsen erhalten bleibt.
- Ungleiche Teilung für einen ratterfreien Schnittreduziert die
- Hochleistungsfräsen von rostfreiem Stahl, Titan und hitzebeständigen Superlegierungen



CARBIDE | 5 | 38° | PLAIN | FLAT | AlTiN

p.C433~C435

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
EMI94060	**EMI96060**	R0.3	**6.0**	6	13	57
EMI94901	**EMI96901**	R0.5	**6.0**	6	13	57
EMI94902	**EMI96902**	R1.0	**6.0**	6	13	57
EMI94080	**EMI96080**	R0.5	**8.0**	8	19	63
EMI94903	-	R1.0	**8.0**	8	19	63
EMI94904	**EMI96904**	R1.5	**8.0**	8	19	63
EMI94905	**EMI96905**	R2.0	**8.0**	8	19	63
EMI94100	**EMI96100**	R0.5	**10.0**	10	22	72
EMI94906	**EMI96906**	R1.0	**10.0**	10	22	72
EMI94907	-	R1.5	**10.0**	10	22	72
EMI94908	**EMI96908**	R2.0	**10.0**	10	22	72
EMI94909	**EMI96909**	R2.5	**10.0**	10	22	72
EMI94120	**EMI96120**	R0.5	**12.0**	12	26	83
EMI94910	**EMI96910**	R1.0	**12.0**	12	26	83
EMI94911	**EMI96911**	R1.5	**12.0**	12	26	83
EMI94912	**EMI96912**	R2.0	**12.0**	12	26	83
EMI94913	**EMI96913**	R2.5	**12.0**	12	26	83
EMI94914	**EMI96914**	R3.0	**12.0**	12	26	83
EMI94160	**EMI96160**	R0.5	**16.0**	16	36	92
EMI94915	-	R1.0	**16.0**	16	36	92
EMI94916	**EMI96916**	R1.5	**16.0**	16	36	92
EMI94917	**EMI96917**	R2.0	**16.0**	16	36	92
EMI94918	**EMI96918**	R2.5	**16.0**	16	36	92

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

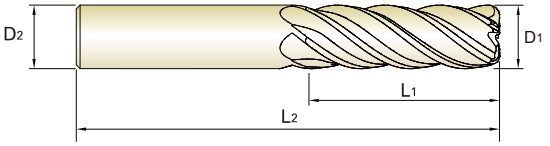
PLAIN SHANK **EMI93 SERIES**
FLAT SHANK **EMI95 SERIES**

CARBIDE, 5 FLUTE STANDARD LENGTH (TitaNox-Power HPC)

HARTMETALL, 5-SCHNEIDEN STANDARD LÄNGE (TITANOX-POWER HPC) HARTMETALL 5
FRAISE CARBURE, 5 DENTS, LONGUEUR STANDARD (TITANOX-POWER HPC)
FRESA MD, 5 TAGLIENTI, SERIE CORTA (TITANOX-POWER HPC)

- New design enhances chip space in heavy cuts, while still maintaining rigidity in peel milling.
- Unequal index design for Chatter-Free cutting.
- High performance milling of Stainless Steel, Titanium, and Heat-Resistant Super Alloys.

- Das neue Design verbessert den Spanraum bei schweren Schnitten, während die Steifigkeit beim Schälfräsen erhalten bleibt.
- Ungleiche Teilung für einen ratterfreien Schnittreduziert die
- Hochleistungsfräsen von rostfreiem Stahl, Titan und hitzebeständigen Superlegierungen

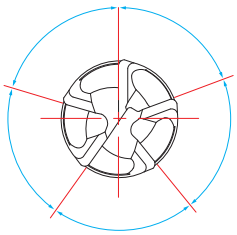


CARBIDE | 5 | 38° | PLAIN | FLAT | AlTiN | p.C433~C435

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
PLAIN	FLAT	D_1	D_2	L_1	L_2	
EMI93060	**EMI95060**	**6.0**	6	13	57	0.20
EMI93080	**EMI95080**	**8.0**	8	19	63	0.20
EMI93100	**EMI95100**	**10.0**	10	22	72	0.30
EMI93120	**EMI95120**	**12.0**	12	26	83	0.35
EMI93160	**EMI95160**	**16.0**	16	36	92	0.40
EMI93200	**EMI95200**	**20.0**	20	44	104	0.50
EMI93250	**EMI95250**	**25.0**	25	54	121	0.50

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6



Unequal Index

Exclusively Designed Unique Geometry applied to Reduce Vibration and also to achieve Excellent surface finish

38° Single Helix

Core Design

YG-1's High Performance Core Geometries is designed for superior chip evacuation. It's excellent at Slotting & Heavy Profiling.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

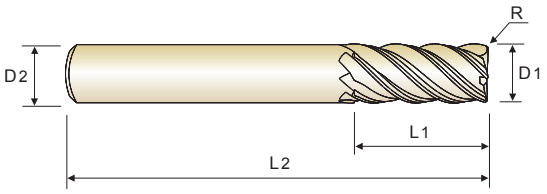
PLAIN SHANK **GMG30** SERIES
FLAT SHANK **GMG31** SERIES

CARBIDE, 5 FLUTE CORNER RADIUS LONG LENGTH

VOLLHARTMETALL, 5 SCHNEIDEN LANG MIT ECKRADIUS
CARBURE, 5 DENTS, TORIQUE, SÉRIE LONGUE
FRESA IN MD, 5 TAGLIENTI, SERIE LUNGA, TORICA

- Excellent performance results and long tool life when machining Titanium and other tough materials.
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling.
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted.

- Exzellente Leistungsergebnisse und hohe Standzeiten beim Bearbeiten von Titan oder anderen robusten Materialien.
- Die Schneiden des Werkzeugs haben eine besondere Festigkeit, so dass es für schwere Profile und zum High-Speed-Fräsen geeignet ist.
- Durch die Fase und den Eckradius werden Ausbrüche verhindert.



CARBIDE | 5 | 43°/44°/45° | PLAIN | FLAT | Y Coating

p.C436

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
GMG30060	**GMG31060**	R0.3	**6.0**	6	13	57
GMG30901	**GMG31901**	R0.5	**6.0**	6	13	57
GMG30902	**GMG31902**	R1.0	**6.0**	6	13	57
GMG30080	-	R0.5	**8.0**	8	19	63
GMG30903	**GMG31903**	R1.0	**8.0**	8	19	63
GMG30904	**GMG31904**	R1.5	**8.0**	8	19	63
GMG30905	**GMG31905**	R2.0	**8.0**	8	19	63
GMG30100	-	R0.5	**10.0**	10	22	72
GMG30906	**GMG31906**	R1.0	**10.0**	10	22	72
GMG30907	**GMG31907**	R1.5	**10.0**	10	22	72
GMG30908	**GMG31908**	R2.0	**10.0**	10	22	72
GMG30120	**GMG31120**	R0.5	**12.0**	12	26	83
GMG30909	**GMG31909**	R1.0	**12.0**	12	26	83
GMG30910	**GMG31910**	R1.5	**12.0**	12	26	83
GMG30911	**GMG31911**	R2.0	**12.0**	12	26	83
GMG30912	-	R2.5	**12.0**	12	26	83
GMG30913	**GMG31913**	R3.0	**12.0**	12	26	83
GMG30160	**GMG31160**	R1.0	**16.0**	16	36	92
GMG30914	-	R1.5	**16.0**	16	36	92
GMG30915	**GMG31915**	R2.0	**16.0**	16	36	92
GMG30916	**GMG31916**	R2.5	**16.0**	16	36	92
GMG30917	**GMG31917**	R3.0	**16.0**	16	36	92

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

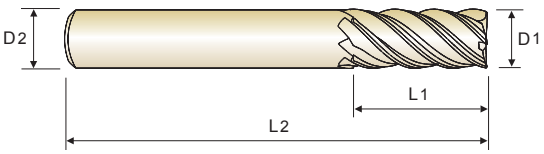
PLAIN SHANK **GMG24** SERIES
FLAT SHANK **GMG25** SERIES

CARBIDE, 5 FLUTE SHORT LENGTH

VOLLHARTMETALL, 5 SCHNEIDEN KURZ
CARBURE, 5 DENTS, SÉRIE COURTE
FRESA IN MD, 5 TAGLIENTI, SERIE CORTA

- Excellent performance results and long tool life when machining Titanium and other tough materials.
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling.
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted.

- Exzellente Leistungsergebnisse und hohe Standzeiten beim Bearbeiten von Titan oder anderen robusten Materialien.
- Die Schneiden des Werkzeugs haben eine besondere Festigkeit, so dass es für schwere Profile und zum High-Speed-Fräsen geeignet ist.
- Durch die Fase und den Eckradius werden Ausbrüche verhindert.



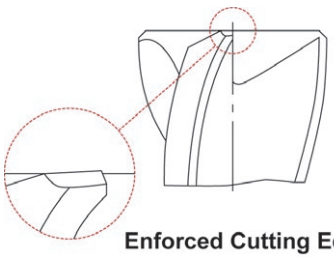
CARBIDE | 5 | 43°/44°/45° | PLAIN | FLAT | C x 45° | Y Coating

p.C437

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
PLAIN	FLAT	D_1	D_2	L_1	L_2	
GMG24060	**GMG25060**	**6.0**	6	10	54	0.20
GMG24080	**GMG25080**	**8.0**	8	12	58	0.20
GMG24100	**GMG25100**	**10.0**	10	14	66	0.30
GMG24120	**GMG25120**	**12.0**	12	16	73	0.35
GMG24160	**GMG25160**	**16.0**	16	22	82	0.40
GMG24200	**GMG25200**	**20.0**	20	26	92	0.50
GMG24250	**GMG25250**	**25.0**	25	29	100	0.50

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

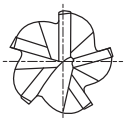
PLAIN SHANK **EHE54** SERIES
FLAT SHANK **EHE55** SERIES

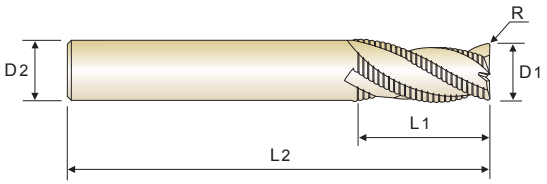
CARBIDE, 5 FLUTE 40˚ HELIX CORNER RADIUS ROUGHING - FINE

VOLLHARTMETALL, 5 SCHNEIDEN 40° HELIX mit ECKRADIUS FÜR FEINSCHRUPPEN
CARBURE, 5 DENTS, HÉLICE 40°, TORIQUE, ÉBAUCHE PAS FINS
FRESA IN MD, 5 TAGLIENTI, ELICA 40°, TORICA, BOMBATO FINE

- Excellent performance results and long tool life when machining Titanium and other tough materials.
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling.
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted.

- Exzellente Leistungsergebnisse und hohe Standzeiten beim Bearbeiten von Titan oder anderen robusten Materialien.
- Die Schneiden des Werkzeugs haben eine besondere Festigkeit, so dass es für schwere Profile und zum High-Speed-Fräsen geeignet ist.
- Durch die Fase und den Eckradius werden Ausbrüche verhindert.





CARBIDE | 5 | 40° | HR | PLAIN | FLAT | TiAlN

p.C437

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1 (h10)	D_2 (h6)	L_1	L_2
EHE54060	**EHE55060**	R0.2	**6.0**	6	16	57
EHE54080	**EHE55080**	R0.2	**8.0**	8	16	63
EHE54100	**EHE55100**	R0.3	**10.0**	10	22	72
EHE54120	**EHE55120**	R0.3	**12.0**	12	26	83
EHE54140	-	R0.3	**14.0**	14	26	83
EHE54160	**EHE55160**	R0.3	**16.0**	16	32	92
EHE54200	-	R0.3	**20.0**	20	38	104
EHE54250	**EHE55250**	R0.3	**25.0**	25	45	121

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛ / Nominal-Diameter in ㎜	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / - 40	0 / - 48	0 / - 58	0 / - 70	0 / - 84
h5	0 / - 4	0 / - 5	0 / - 6	0 / - 8	0 / - 9

* Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend												○	○	○						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

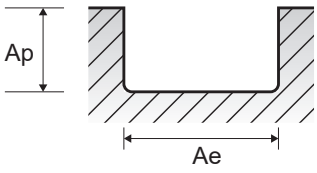
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GMG40, GMG41

4 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	1.0D	Vc	125	125	125	125	125	125	125	125
					fz	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.084
					RPM	6631	4974	3979	3316	2842	2487	1989	1592
					FEED	663	676	668	650	637	627	557	535
	5	Low alloy steel	1.0D	1.0D	Vc	120	120	120	120	120	120	120	120
					fz	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.077
					RPM	6366	4775	3820	3183	2728	2387	1910	1528
					FEED	637	649	642	624	611	602	535	471
	6-7		1.0D	1.0D	Vc	125	125	125	125	125	125	125	125
					fz	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.084
					RPM	6631	4974	3979	3316	2842	2487	1989	1592
					FEED	663	676	668	650	637	627	557	535
	8-9		1.0D	1.0D	Vc	120	120	120	120	120	120	120	120
					fz	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.077
					RPM	6366	4775	3820	3183	2728	2387	1910	1528
					FEED	637	649	642	624	611	602	535	471
	10-11.1	High alloyed steel, and tool steel	1.0D	1.0D	Vc	120	120	120	120	120	120	120	120
					fz	0.027	0.035	0.042	0.053	0.058	0.063	0.077	0.084
					RPM	6366	4775	3820	3183	2728	2387	1910	1528
					FEED	688	668	642	675	633	602	588	513
M	12-13	Stainless steel	1.0D	1.0D	Vc	125	125	125	125	125	125	125	125
					fz	0.034	0.046	0.057	0.067	0.074	0.081	0.095	0.105
					RPM	6631	4974	3979	3316	2842	2487	1989	1592
					FEED	902	915	907	889	841	806	756	668
	14.1		1.0D	1.0D	Vc	85	85	85	85	85	85	85	85
					fz	0.025	0.034	0.042	0.048	0.055	0.062	0.071	0.081
					RPM	4509	3382	2706	2255	1933	1691	1353	1082
					FEED	451	460	455	433	425	419	384	351
	14.2		1.0D	0.5D	Vc	36	36	36	36	36	36	36	36
					fz	0.016	0.021	0.027	0.032	0.036	0.040	0.046	0.052
					RPM	1910	1432	1146	955	819	716	573	458
					FEED	122	120	124	122	118	115	105	95
K	15-20	Grey cast iron	1.0D	1.0D	Vc	140	140	140	140	140	140	140	140
					fz	0.021	0.028	0.035	0.042	0.048	0.053	0.060	0.067
					RPM	7427	5570	4456	3714	3183	2785	2228	1783
					FEED	624	624	624	624	611	590	535	478
S	31-35	Heat Resistant Super Alloys	1.0D	0.4D	Vc	25	25	25	25	25	25	25	25
					fz	0.018	0.024	0.030	0.036	0.040	0.044	0.050	0.055
					RPM	1326	995	796	663	568	497	398	318
					FEED	95	95	95	95	91	88	80	70
	36-37	Titanium Alloys	1.0D	1.0D	Vc	55	55	55	55	55	55	55	55
					fz	0.034	0.046	0.057	0.067	0.076	0.086	0.095	0.105
					RPM	2918	2188	1751	1459	1251	1094	875	700
					FEED	397	403	399	391	380	376	333	294



TitaNox-POWER END MILLS

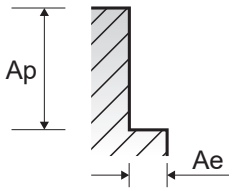
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EMI94 EMI93 EMI96 EMI95

5 FLUTES CORNER RADIUS (TitaNox-Power HPC)
- SIDE CUTTING (Peel Milling)

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1~5	Non-alloy steel	0.08D	2.0D	Vc	198	198	198	198	198	198	198
					fz	0.053	0.067	0.083	0.103	0.131	0.160	0.170
					RPM	10504	7878	6303	5252	3939	3151	2521
					FEED	2784	2639	2616	2705	2580	2521	2143
	6~8	Low alloy steel	0.08D	2.0D	Vc	198	198	198	198	198	198	198
					fz	0.053	0.067	0.083	0.103	0.131	0.160	0.170
					RPM	10504	7878	6303	5252	3939	3151	2521
					FEED	2784	2639	2616	2705	2580	2521	2143
	9		0.08D	2.0D	Vc	198	198	198	198	198	198	198
					fz	0.041	0.051	0.064	0.079	0.102	0.123	0.133
					RPM	10504	7878	6303	5252	3939	3151	2521
					FEED	2153	2009	2017	2075	2009	1938	1676
	10	High alloyed steel, and tool steel	0.08D	2.0D	Vc	177	177	177	177	177	177	177
					fz	0.053	0.067	0.083	0.103	0.131	0.160	0.170
					RPM	9390	7043	5634	4695	3521	2817	2254
					FEED	2488	2359	2338	2418	2306	2254	1916
	11.1		0.08D	2.0D	Vc	168	168	168	168	168	168	168
					fz	0.041	0.051	0.064	0.079	0.102	0.123	0.133
					RPM	8913	6685	5348	4456	3342	2674	2139
					FEED	1827	1705	1711	1760	1704	1645	1422
M	12	Stainless steel	0.06D	2.0D	Vc	107	107	107	107	107	107	107
					fz	0.036	0.041	0.056	0.070	0.087	0.104	0.113
					RPM	5677	4257	3406	2838	2129	1703	1362
					FEED	1022	873	954	993	926	886	770
	14.1		0.06D	2.0D	Vc	130	130	130	130	130	130	130
					fz	0.043	0.049	0.067	0.086	0.100	0.117	0.128
					RPM	6897	5173	4138	3448	2586	2069	1655
					FEED	1483	1267	1386	1483	1293	1210	1059
	14.2		0.06D	2.0D	Vc	91	91	91	91	91	91	91
					fz	0.034	0.038	0.053	0.070	0.079	0.093	0.103
					RPM	4828	3621	2897	2414	1810	1448	1159
					FEED	821	688	768	845	715	673	597
K	15~20	Grey cast iron	0.07D	2.0D	Vc	168	168	168	168	168	168	168
					fz	0.048	0.056	0.072	0.089	0.115	0.139	0.148
					RPM	8913	6685	5348	4456	3342	2674	2139
					FEED	2139	1872	1925	1983	1922	1858	1583
S	33	Heat Resistant Super Alloys	0.04D	2.0D	Vc	37	37	37	37	37	37	37
					fz	0.024	0.031	0.037	0.046	0.054	0.061	0.068
					RPM	1963	1472	1178	981	736	589	471
					FEED	236	228	218	226	199	180	160
	37	Titanium Alloys	0.05D	2.0D	Vc	91	91	91	91	91	91	91
					fz	0.024	0.031	0.037	0.046	0.054	0.061	0.068
					RPM	4828	3621	2897	2414	1810	1448	1159
					FEED	579	561	536	555	489	442	394



TitaNox-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

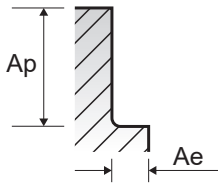
GMG28 GMG30 GMG29 GMG31

5 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.3D	1.5D(*)	Vc	144	144	144	144	144	144	144	144	144
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.083	0.089	0.101
					RPM	7639	5730	4584	3820	3274	2865	2546	2292	1833
					FEED	1299	1089	1146	1203	1130	1089	1057	1020	926
	5	Low alloy steel	0.3D	1.5D(*)	Vc	101	101	101	101	101	101	101	101	101
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.083	0.089	0.101
					RPM	5358	4019	3215	2679	2296	2009	1786	1607	1286
					FEED	911	764	804	844	792	764	741	715	649
	6-7		0.3D	1.5D(*)	Vc	144	144	144	144	144	144	144	144	144
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.083	0.089	0.101
					RPM	7639	5730	4584	3820	3274	2865	2546	2292	1833
					FEED	1299	1089	1146	1203	1130	1089	1057	1020	926
	8-9		0.3D	1.5D(*)	Vc	101	101	101	101	101	101	101	101	101
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.083	0.089	0.101
					RPM	5358	4019	3215	2679	2296	2009	1786	1607	1286
					FEED	911	764	804	844	792	764	741	715	649
	10-11.1	High alloyed steel, and tool steel	0.3D	1.5D(*)	Vc	60	60	60	60	60	60	60	60	60
					fz	0.024	0.027	0.035	0.044	0.049	0.054	0.058	0.062	0.071
					RPM	3183	2387	1910	1592	1364	1194	1061	955	764
					FEED	382	322	334	350	334	322	308	296	271
M	12-13	Stainless steel	0.3D	1.5D(*)	Vc	117	117	117	117	117	117	117	117	117
					fz	0.024	0.025	0.030	0.046	0.051	0.054	0.057	0.061	0.071
					RPM	6207	4655	3724	3104	2660	2328	2069	1862	1490
					FEED	745	582	559	714	678	628	590	568	529
	14.1		0.3D	1.5D(*)	Vc	82	82	82	82	82	82	82	82	82
					fz	0.030	0.032	0.038	0.063	0.065	0.069	0.070	0.076	0.088
					RPM	4350	3263	2610	2175	1864	1631	1450	1305	1044
					FEED	653	522	496	685	606	563	508	496	459
	14.2		0.3D	1.5D(*)	Vc	59	59	59	59	59	59	59	59	59
					fz	0.030	0.032	0.038	0.063	0.065	0.069	0.070	0.076	0.088
					RPM	3130	2348	1878	1565	1341	1174	1043	939	751
					FEED	470	376	357	493	436	405	365	357	331
K	15-20	Grey cast iron	0.3D	1.5D(*)	Vc	106	106	106	106	106	106	106	106	106
					fz	0.043	0.048	0.063	0.079	0.087	0.096	0.103	0.111	0.126
					RPM	5623	4218	3374	2812	2410	2109	1874	1687	1350
					FEED	1209	1012	1063	1111	1048	1012	965	936	850
S	31-35	Heat Resistant Super Alloys	0.1D	1.5D	Vc	31	31	31	31	31	31	31	31	31
					fz	0.021	0.022	0.027	0.044	0.046	0.048	0.049	0.053	0.062
					RPM	1645	1233	987	822	705	617	548	493	395
					FEED	173	136	133	181	162	148	134	131	122
	36-37	Titanium Alloys	0.3D	1.5D(*)	Vc	69	69	69	69	69	69	69	69	69
					fz	0.027	0.029	0.034	0.057	0.059	0.062	0.063	0.069	0.079
					RPM	3661	2745	2196	1830	1569	1373	1220	1098	879
					FEED	494	398	373	522	463	426	384	379	347

* Maximum recommended depth shown.
* Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less.
* Reduce speed and feed recommendations for materials harder than listed.
* Above recommendations are based on ideal conditions.
  Adjust parameters accordingly for smaller taper machining centers or less rigid conditions.



Global Cutting Tool Leader **YG-1**

MILLING

Leading Through Innovation

SOLID CARBIDE

JET-POWER END MILLS

JET - POWER VHM - FRÄSERFRÄSER

- For Exotic materials like Stainless Steels, Nickel Alloys and Titanium
- Für Sonderwerkstoffe wie rostfreie Stähle, Nickellegierungen und Titan.

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
JET-POWER END MILLS

Exotic materials like Stainless Steels
Nickel alloys and Titanium

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C451

SERIES	EH911 EH912	EH913 EH914
FLUTE	2	4
HELIX ANGLE	35°	35°
CUTTING EDGE SHAPE	SQUARE	SQUARE
SIZE MIN	D1.0	D2.0
SIZE MAX	D25.0	D25.0
PAGE	C442	C444
	SHORT LENGTH	SHORT LENGTH
	TiAlN	TiAlN

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○
	2		About 0.45% C	Annealed	190	13	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎
	6	Low alloy steel		Annealed	180	10	○	○
	7			Quenched & Tempered	275	29	◎	◎
	8			Quenched & Tempered	300	32	◎	◎
	9			Quenched & Tempered	350	38	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○
	11			Quenched & Tempered	325	35	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○
	14		Austenitic		180	10	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm		◎	◎
	37		Alpha + Beta Alloys	Hardened	1050 Rm		◎	◎
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42	○	○
	41	Hardened Cast Iron		Hardened	550	55		

JET-POWER END MILLS

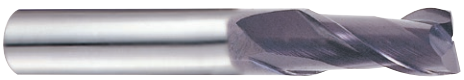
PLAIN SHANK **EH911 SERIES**
FLAT SHANK **EH912 SERIES**

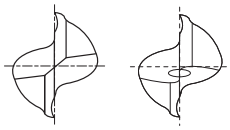
CARBIDE, 2 FLUTE 35° HELIX SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN 35° RECHTSSPIRALE KURZ
Fraise carbure, 2 dents, hélice 35°, courte
2 TAGLIENTI, ELICA 35°, CORTA

- Ultra micro grain carbide
- Reduces chipping of corner edges
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, etc

- Ultra Feinstkorn - Vollhartmetall.
- Verstärkte Schneidkante.
- zur Bearbeitung von: Werkstoffen bis 45 HRc, rostfreien Stählen, Titan und Nickellegierungen.





CARBIDE | 2 | 35° | PLAIN | FLAT | TiAlN

p.C451

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	D_1	D_2	L_1	L_2
EH911010	-	**1.0**	4	2.5	40
EH911901	-	**1.0**	6	2.5	40
EH911015	-	**1.5**	4	4	40
EH911902	-	**1.5**	6	4	40
EH911020	-	**2.0**	4	6	40
EH911903	-	**2.0**	6	6	40
EH911025	-	**2.5**	4	8	40
EH911904	-	**2.5**	6	8	40
EH911030	-	**3.0**	6	8	45
EH911035	-	**3.5**	6	10	45
-	**EH912040**	**4.0**	6	11	45
EH911045	**EH912045**	**4.5**	6	11	45
EH911050	**EH912050**	**5.0**	6	13	50
EH911055	-	**5.5**	6	13	50
EH911060	-	**6.0**	6	13	50
EH911065	-	**6.5**	8	16	60
EH911070	**EH912070**	**7.0**	8	16	60
EH911075	-	**7.5**	8	16	60
EH911080	-	**8.0**	8	19	60
EH911085	-	**8.5**	10	19	70

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

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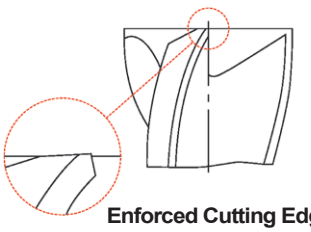


Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																◎	◎			○	

JET-POWER END MILLS

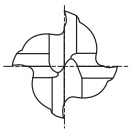
PLAIN SHANK **EH913** SERIES
FLAT SHANK **EH914** SERIES

CARBIDE, 4 FLUTE 35° HELIX SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN 35° RECHTSSPIRALE KURZ
Fraise carbure, 4 dents, hélice 35°, courte
4 TAGLIENTI, ELICA 35°, CORTA

- Ultra micro grain carbide
- Reduces chipping of corner edges
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, etc

- Ultra Feinstkorn - Vollhartmetall
- Verstärkte Schneidkante.
- Für die Bearbeitung von: Werkstoffen bis 45 HRc, rostfreien Stählen, Titan und Nickellegierungen.



CARBIDE | 4 | 35° | PLAIN | FLAT | TiAlN

p.C452

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	D_1	D_2	L_1	L_2
EH913020	-	**2.0**	4	6	40
EH913901	**EH914901**	**2.0**	6	6	40
EH913025	-	**2.5**	4	8	40
EH913902	**EH914902**	**2.5**	6	8	40
EH913030	**EH914030**	**3.0**	6	8	45
EH913035	-	**3.5**	6	10	45
EH913040	**EH914040**	**4.0**	6	11	45
EH913045	**EH914045**	**4.5**	6	11	45
EH913050	**EH914050**	**5.0**	6	13	50
EH913055	-	**5.5**	6	13	50
EH913060	**EH914060**	**6.0**	6	13	50
EH913065	-	**6.5**	8	16	60
EH913070	**EH914070**	**7.0**	8	16	60
EH913080	-	**8.0**	8	19	60
EH913085	**EH914085**	**8.5**	10	19	70
EH913090	-	**9.0**	10	19	70
EH913095	-	**9.5**	10	19	70
EH913100	**EH914100**	**10.0**	10	22	70
EH913110	-	**11.0**	12	22	75

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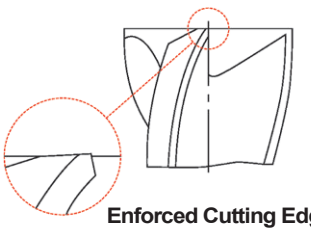
Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																◎	◎			○	

JET-POWER END MILLS

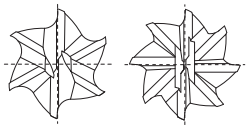
PLAIN SHANK **EH915 SERIES**
FLAT SHANK **EH916 SERIES**

CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH (Positive Rake Angle)

VOLLHARTMETALL, 6&8 SCHNEIDEN 45° RECHTSSPIRALE LANG
Fraise carbure, 6&8 dents, hélice 45°, longue (Angle de coupe positif)
6&8 TAGLIENTI, ELICA 45°, LUNGA (Tagliente positivizzato)

- Ultra micro grain carbide
- Reduces chipping of corner edges
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, etc

- Ultra Feinstkorn - Vollhartmetall
- Verstärkte Schneidkante.
- zur Bearbeitung von: Werkstoffen bis 45 HRc, rostfreien Stählen, Titan und Nickellegierungen.

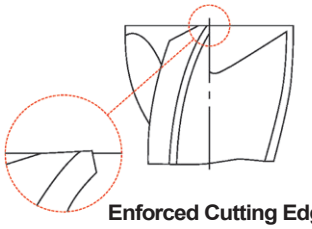


CARBIDE | 6&8 | 45° | PLAIN | FLAT | TiAlN | p.C453

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
PLAIN	FLAT	D_1	D_2	L_1	L_2	
EH915060	**EH916060**	**6.0**	6	13	57	6
EH915070	**EH916070**	**7.0**	8	16	63	6
EH915080	-	**8.0**	8	19	63	6
EH915090	**EH916090**	**9.0**	10	19	72	6
EH915100	**EH916100**	**10.0**	10	22	72	6
EH915120	-	**12.0**	12	26	83	6
EH915140	-	**14.0**	14	26	83	6
EH915160	-	**16.0**	16	32	92	6
EH915180	**EH916180**	**18.0**	18	32	92	8
EH915200	**EH916200**	**20.0**	20	38	104	8
EH915250	**EH916250**	**25.0**	25	44	104	8

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎			○	

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

JET-POWER END MILLS

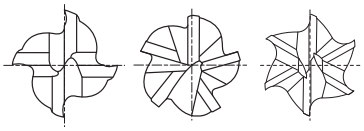
PLAIN SHANK **EH917** SERIES
FLAT SHANK **EH918** SERIES

CARBIDE, MULTI FLUTE 45° HELIX SHORT LENGTH ROUGHING - FINE

VOLLHARTMETALL, MULTI SCHNEIDEN 45° RECHTSSPIRALE KURZ SCHRUPPFRÄSER - FEIN
Fraise carbure, multi-dents ébauche, hélice 45°, pas fin, courte
4 - 5 - 6 TAGLIENTI, ELICA 45°, PER SGROSSATURA, CORTA - Bombato fine

- Ultra micro grain carbide
- High chip removal and minimizing breakages of cutting edges.
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, etc

- Ultra Feinstkorn - Vollhartmetall
- Schnelle Spanausfuhr und Minimierung von Abbrechen von Schneidkanten.
- zur Bearbeitung von: Werkstoffen bis 45 HRc, rostfreien Stählen, Titan und Nickellegierungen.



CARBIDE | HR | 4-6 | 45° | PLAIN | FLAT | C x 45° | TiAlN

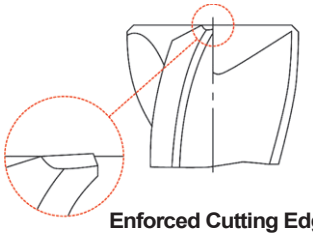
p.C456~C457

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
PLAIN	FLAT	h10	h5				
EH917060	**EH918060**	**6.0**	6	7	54	4	0.15
EH917080	**EH918080**	**8.0**	8	9	58	4	0.18
EH917100	**EH918100**	**10.0**	10	14	66	4	0.20
EH917120	**EH918120**	**12.0**	12	16	73	4	0.20
-	**EH918160**	**16.0**	16	22	82	5	0.20

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛					
Nominal-Diameter in ㎜					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / - 40	0 / - 48	0 / - 58	0 / - 70	0 / - 84
h5	0 / - 4	0 / - 5	0 / - 6	0 / - 8	0 / - 9



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

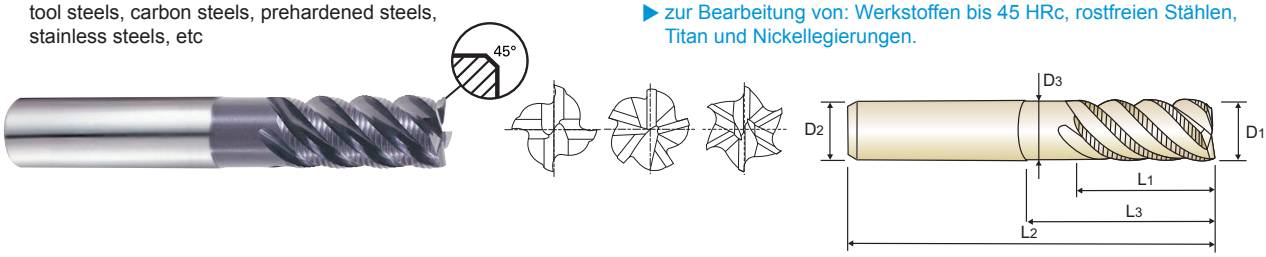
PLAIN SHANK **EH921** SERIES
FLAT SHANK **EH942** SERIES

CARBIDE, MULTI FLUTE 45° HELIX LONG REACH ROUGHING - FINE

VOLLHARTMETALL, MULTI SCHNEIDEN 45° RECHTSSPIRALE GROßE REICHWEITE SCHRUPPFRÄSER - FEIN
Fraise carbure, multi-dents ébauche longue portée, hélice 45°, pas fin
MULTITAGLIENTI, ELICA 45° SCARICATA, PER SGROSSATURA, LUNGA - Bombato fine

- Ultra micro grain carbide
- High chip removal and minimizing breakages of cutting edges.
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, etc

- Ultra Feinstkorn - Vollhartmetall
- Schnelle Spanausfuhr und Minimierung von Abbrechen von Schneidkanten.
- zur Bearbeitung von: Werkstoffen bis 45 HRc, rostfreien Stählen, Titan und Nickellegierungen.



CARBIDE | HR | 4-6 | 45° | PLAIN | FLAT | C x 45° | TiAlN

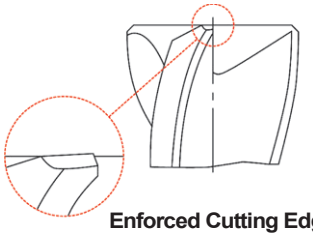
p.C456~C457

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute	Chamfer
PLAIN	FLAT	D_1(h10)	D_2(h5)	L_1	L_3	L_2	D_3		
EH921060	**EH942060**	**6.0**	6	16	20	57	5.5	4	0.15
EH921080	**EH942080**	**8.0**	8	16	26	63	7.5	4	0.18
EH921100	**EH942100**	**10.0**	10	22	31	72	9.5	4	0.2
EH921120	**EH942120**	**12.0**	12	26	37	83	11.5	4	0.2
EH921160	-	**16.0**	16	32	51	100	15.5	5	0.2
EH921200	**EH942200**	**20.0**	20	38	59	110	19.2	6	0.2

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛					
Nominal-Diameter in ㎜					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / - 40	0 / - 48	0 / - 58	0 / - 70	0 / - 84
h5	0 / - 4	0 / - 5	0 / - 6	0 / - 8	0 / - 9



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	◎	◎			○	

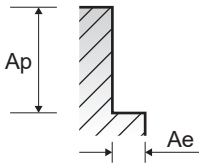
JET-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EH913, EH914 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.05D	1.0D	Vc	75	85	95	100	105	105	100	105	110	105	105
					fz	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048	0.046
					RPM	11937	9019	7560	6366	5570	4178	3183	2785	2188	1671	1337
					FEED	286	325	575	611	668	702	598	524	411	321	246
	5		0.05D	1.0D	Vc	50	50	60	60	65	65	65	65	70	65	65
					fz	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.037	0.038	0.039
					RPM	7958	5305	4775	3820	3448	2586	2069	1724	1393	1035	828
					FEED	191	191	363	367	428	393	314	255	206	157	129
	6-7	Low alloy steel	0.05D	1.0D	Vc	75	85	95	100	105	105	100	105	110	105	105
					fz	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048	0.046
					RPM	11937	9019	7560	6366	5570	4178	3183	2785	2188	1671	1337
					FEED	286	325	575	611	668	702	598	524	411	321	246
	8-9		0.05D	1.0D	Vc	50	50	60	60	65	65	65	65	70	65	65
					fz	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.037	0.038	0.039
					RPM	7958	5305	4775	3820	3448	2586	2069	1724	1393	1035	828
					FEED	191	191	363	367	428	393	314	255	206	157	129
	10	High alloyed steel, and tool steel	0.05D	1.0D	Vc	75	85	95	100	105	105	100	105	110	105	105
					fz	0.006	0.009	0.019	0.024	0.03	0.042	0.047	0.047	0.047	0.048	0.046
					RPM	11937	9019	7560	6366	5570	4178	3183	2785	2188	1671	1337
					FEED	286	325	575	611	668	702	598	524	411	321	246
	11.1 - 11.2		0.05D	1.0D	Vc	50	50	60	60	65	65	65	65	70	65	65
					fz	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.037	0.038	0.039
					RPM	7958	5305	4775	3820	3448	2586	2069	1724	1393	1035	828
					FEED	191	191	363	367	428	393	314	255	206	157	129
M	14.1	Stainless steel	0.05D	1.0D	Vc	40	45	50	50	55	55	55	50	55	55	55
					fz	0.006	0.009	0.018	0.024	0.029	0.042	0.045	0.044	0.047	0.045	0.044
					RPM	6366	4775	3979	3183	2918	2188	1751	1326	1094	875	700
					FEED	153	172	286	306	338	368	315	233	206	158	123
S	36-37	Titanium Alloys	0.05D	1.0D	Vc	40	45	50	50	55	55	55	50	55	55	55
					fz	0.006	0.009	0.018	0.024	0.029	0.042	0.045	0.044	0.047	0.045	0.044
					RPM	6366	4775	3979	3183	2918	2188	1751	1326	1094	875	700
					FEED	153	172	286	306	338	368	315	233	206	158	123
H	40	Chilled Cast Iron	0.05D	1.0D	Vc	50	50	60	60	65	65	65	65	70	65	65
					fz	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.037	0.038	0.039
					RPM	7958	5305	4775	3820	3448	2586	2069	1724	1393	1035	828
					FEED	191	191	363	367	428	393	314	255	206	157	129



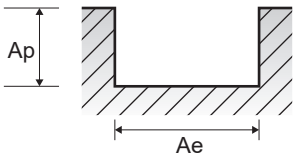
JET-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EH831, EH841 SERIES — MULTI FLUTES ROUGHING - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	0.5D	Vc	294	292	289	302	299	302	294	302	338
					fz	0.03	0.04	0.038	0.045	0.053	0.06	0.067	0.068	0.06
					RPM	15597	11618	9199	8011	6798	6008	5199	4806	4304
					FEED	1404	1394	1398	1442	1441	1442	1393	1307	1291
	5		1.0D	0.5D	Vc	234	231	239	226	229	241	249	226	251
					fz	0.013	0.018	0.016	0.02	0.024	0.024	0.024	0.024	0.023
					RPM	12414	9191	7608	5995	5207	4795	4403	3597	3196
					FEED	484	496	487	480	500	460	423	345	368
	6-7	Low alloy steel	1.0D	0.5D	Vc	294	292	289	302	299	302	294	302	338
					fz	0.03	0.04	0.038	0.045	0.053	0.06	0.067	0.068	0.06
					RPM	15597	11618	9199	8011	6798	6008	5199	4806	4304
					FEED	1404	1394	1398	1442	1441	1442	1393	1307	1291
	8-9		1.0D	0.5D	Vc	234	231	239	226	229	241	249	226	251
					fz	0.013	0.018	0.016	0.02	0.024	0.024	0.024	0.024	0.023
					RPM	12414	9191	7608	5995	5207	4795	4403	3597	3196
					FEED	484	496	487	480	500	460	423	345	368
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	294	292	289	302	299	302	294	302	338
					fz	0.03	0.04	0.038	0.045	0.053	0.06	0.067	0.068	0.06
					RPM	15597	11618	9199	8011	6798	6008	5199	4806	4304
					FEED	1404	1394	1398	1442	1441	1442	1393	1307	1291
	11.1 - 11.2		1.0D	0.5D	Vc	234	231	239	226	229	241	249	226	251
					fz	0.013	0.018	0.016	0.02	0.024	0.024	0.024	0.024	0.023
					RPM	12414	9191	7608	5995	5207	4795	4403	3597	3196
					FEED	484	496	487	480	500	460	423	345	368
M	14.1	Stainless steel	1.0D	Ø4 ~10:0.25D Ø12~16:0.15D Ø18~25:0.1D	Vc	158	158	160	158	158	166	153	151	170
					fz	0.013	0.018	0.017	0.02	0.024	0.023	0.023	0.023	0.023
					RPM	8382	6287	5093	4191	3592	3302	2706	2403	2165
					FEED	327	339	346	335	345	304	249	221	249
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	Vc	45	45	41	45	40	40	40	41	47
					fz	0.016	0.02	0.022	0.024	0.022	0.02	0.021	0.023	0.022
					RPM	2387	1790	1305	1194	909	796	707	653	598
					FEED	115	107	115	115	80	64	59	60	66
	36-37	Titanium Alloys	1.0D	Ø4 ~10:0.25D Ø12~16:0.15D Ø18~25:0.1D	Vc	158	158	160	158	158	166	153	151	170
					fz	0.013	0.018	0.017	0.02	0.024	0.023	0.023	0.023	0.023
					RPM	8382	6287	5093	4191	3592	3302	2706	2403	2165
					FEED	327	339	346	335	345	304	249	221	249
H	40	Chilled Cast Iron	1.0D	0.5D	Vc	234	231	239	226	229	241	249	226	251
					fz	0.013	0.018	0.016	0.02	0.024	0.024	0.024	0.024	0.023
					RPM	12414	9191	7608	5995	5207	4795	4403	3597	3196
					FEED	484	496	487	480	500	460	423	345	368



JET-POWER END MILLS

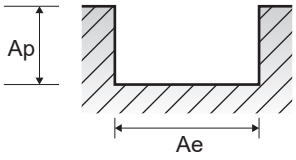
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EH917, EH918 SERIES
EH921, EH942 SERIES

MULTI FLUTES ROUGHING - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	1.0D	0.5D	Vc	294	292	289	302	302	302
					fz	0.022	0.03	0.038	0.045	0.048	0.045
					RPM	15597	11618	9199	8011	6008	4806
					FEED	1373	1394	1398	1442	1442	1298
	5		1.0D	0.5D	Vc	234	231	239	226	241	226
					fz	0.01	0.014	0.016	0.02	0.019	0.016
					RPM	12414	9191	7608	5995	4795	3597
					FEED	497	515	487	480	455	345
	6-7	Low alloy steel	1.0D	0.5D	Vc	294	292	289	302	302	302
					fz	0.022	0.03	0.038	0.045	0.048	0.045
					RPM	15597	11618	9199	8011	6008	4806
					FEED	1373	1394	1398	1442	1442	1298
	8-9		1.0D	0.5D	Vc	234	231	239	226	241	226
					fz	0.01	0.014	0.016	0.02	0.019	0.016
					RPM	12414	9191	7608	5995	4795	3597
					FEED	497	515	487	480	455	345
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	294	292	289	302	302	302
					fz	0.022	0.03	0.038	0.045	0.048	0.045
					RPM	15597	11618	9199	8011	6008	4806
					FEED	1373	1394	1398	1442	1442	1298
	11.1 - 11.2		1.0D	0.5D	Vc	234	231	239	226	241	226
					fz	0.01	0.014	0.016	0.02	0.019	0.016
					RPM	12414	9191	7608	5995	4795	3597
					FEED	497	515	487	480	455	345
M	14.1	Stainless steel	1.0D	Ø4 ~10:0.25D Ø12~16:0.15D Ø18~25:0.10D	Vc	158	158	160	158	166	151
					fz	0.01	0.013	0.017	0.02	0.019	0.015
					RPM	8382	6287	5093	4191	3302	2403
					FEED	335	327	346	335	314	216
S	31-35	Heat Resistant Super Alloys	1.0D	0.5D	Vc	45	45	41	45	40	41
					fz	0.012	0.015	0.022	0.024	0.016	0.015
					RPM	2387	1790	1305	1194	796	653
					FEED	115	107	115	115	64	59
	36-37	Titanium Alloys	1.0D	Ø4 ~10:0.25D Ø12~16:0.15D Ø18~25:0.10D	Vc	158	158	160	158	166	151
					fz	0.01	0.013	0.017	0.02	0.019	0.015
					RPM	8382	6287	5093	4191	3302	2403
					FEED	335	327	346	335	314	216
H	40	Chilled Cast Iron	1.0D	0.5D	Vc	234	231	239	226	241	226
					fz	0.01	0.014	0.016	0.02	0.019	0.016
					RPM	12414	9191	7608	5995	4795	3597
					FEED	372	386	487	480	455	345



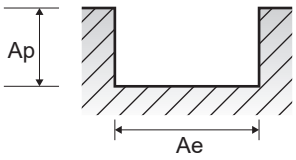
JET-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EH919, EH920 SERIES — MULTI FLUTES ROUGHING - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 4.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	0.5D	Vc	294	294	292	289	302	299	302	302	338
					fz	0.02	0.022	0.03	0.038	0.045	0.042	0.048	0.045	0.05
					RPM	23396	15597	11618	9199	8011	6798	6008	4806	4304
					FEED	1404	1373	1394	1398	1442	1428	1442	1298	1291
	5		1.0D	0.5D	Vc	234	234	231	239	226	229	241	226	251
					fz	0.009	0.01	0.014	0.016	0.02	0.019	0.019	0.016	0.019
					RPM	18621	12414	9191	7608	5995	5207	4795	3597	3196
					FEED	503	497	515	487	480	495	455	345	364
	6-7	Low alloy steel	1.0D	0.5D	Vc	294	294	292	289	302	299	302	302	338
					fz	0.02	0.022	0.03	0.038	0.045	0.042	0.048	0.045	0.05
					RPM	23396	15597	11618	9199	8011	6798	6008	4806	4304
					FEED	1404	1373	1394	1398	1442	1428	1442	1298	1291
	8-9		1.0D	0.5D	Vc	234	234	231	239	226	229	241	226	251
					fz	0.009	0.01	0.014	0.016	0.02	0.019	0.019	0.016	0.019
					RPM	18621	12414	9191	7608	5995	5207	4795	3597	3196
					FEED	503	497	515	487	480	495	455	345	364
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	294	294	292	289	302	299	302	302	338
					fz	0.02	0.022	0.03	0.038	0.045	0.042	0.048	0.045	0.05
					RPM	23396	15597	11618	9199	8011	6798	6008	4806	4304
					FEED	1404	1373	1394	1398	1442	1428	1442	1298	1291
	11.1 - 11.2		1.0D	0.5D	Vc	234	234	231	239	226	229	241	226	251
					fz	0.009	0.01	0.014	0.016	0.02	0.019	0.019	0.016	0.019
					RPM	18621	12414	9191	7608	5995	5207	4795	3597	3196
					FEED	503	497	515	487	480	495	455	345	364
M	14.1	Stainless steel	1.0D	Ø4 ~10:0.25D Ø12~16:0.15D Ø18~25:0.10D	Vc	158	158	158	160	158	158	166	151	170
					fz	0.009	0.01	0.013	0.017	0.02	0.019	0.019	0.015	0.019
					RPM	12573	8382	6287	5093	4191	3592	3302	2403	2165
					FEED	339	335	327	346	335	341	314	216	247
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	Vc	45	45	45	41	45	40	40	41	47
					fz	0.011	0.012	0.015	0.022	0.024	0.018	0.016	0.015	0.018
					RPM	3581	2387	1790	1305	1194	909	796	653	598
					FEED	118	115	107	115	115	82	64	59	65
	36-37	Titanium Alloys	1.0D	Ø4 ~10:0.25D Ø12~16:0.15D Ø18~25:0.10D	Vc	158	158	158	160	158	158	166	151	170
					fz	0.009	0.01	0.013	0.017	0.02	0.019	0.019	0.015	0.019
					RPM	12573	8382	6287	5093	4191	3592	3302	2403	2165
					FEED	339	335	327	346	335	341	314	216	247
H	40	Chilled Cast Iron	1.0D	0.5D	Vc	234	234	231	239	226	229	241	226	251
					fz	0.009	0.01	0.014	0.016	0.02	0.019	0.019	0.016	0.019
					RPM	18621	12414	9191	7608	5995	5207	4795	3597	3196
					FEED	503	497	515	487	480	495	455	345	364



Global Cutting Tool Leader **YG-1**

MILLING

Leading Through Innovation

SOLID CARBIDE

V7 PLUS END MILLS

V7 Plus VHM - Schaftfräser

- High Performance Carbide End Mills for Steels, Cast Iron and Stainless Steels

- Hochleistungs-VHM-Schaftfräser für Stähle, Gusseisen und rostfreie Stähle

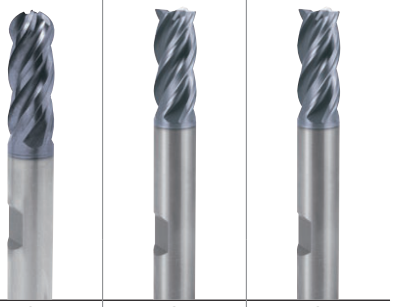
SELECTION GUIDE

YG MILLING TOOLS

SERIES	GMG55 GMG56	GMF54 GMF55	GMF58 GMF59
FLUTE	4	4	4
HELIX ANGLE	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R1.5	D3.0	D3.0
SIZE MAX	R12.5	D20.0	D25.0
PAGE	C464	C465	C466
	LONG LENGTH	SHORT LENGTH	LONG LENGTH
	Y-Coating	Y-Coating	Y-Coating

SOLID CARBIDE
V7 PLUS END MILLS

High performance carbide end mills
for Steels, Cast Iron and Stainless Steels



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C482

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	◎	◎
	20		Pearlitic		230	21	◎	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○
	32			Cured	280	30	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○
	34			Cured	350	38	○	○	○
	35			Cast	320	34	○	○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	○
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

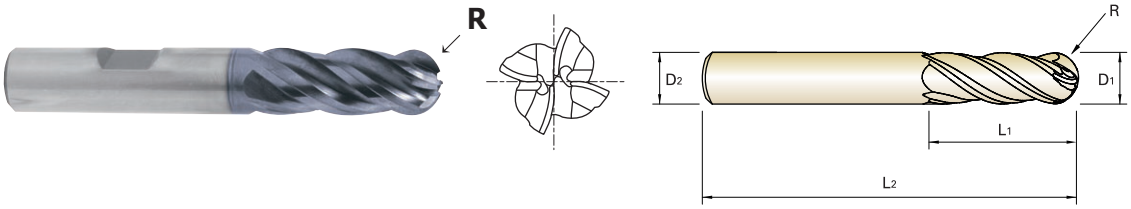
V7 PLUS END MILLS

PLAIN SHANK **GMG55** SERIES
FLAT SHANK **GMG56** SERIES

CARBIDE, 4 FLUTE BALL NOSE LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN STIRNRADIUS
CARBURE, 4 DENTS, HÉMISPHÉRIQUE
MD, 4 TAGLIENTI SEMISFERICA

- ▶Special flute geometry and multiple helix eliminate vibrations
- ▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40
- ▶Die spezielle Schneidengeometrie und der ungleiche Drall verhindern Vibrationen
- ▶Exzellente Leistung in Edelstählen, Baustählen, Guss und Stählen unter 40HRc



CARBIDE | 4 | 35°/37° | R ±0.02 | PLAIN | FLAT | Y Coating

p.C482

Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
-	GMG56030	R1.5	3.0	6	8	57
GMG55040	GMG56040	R2.0	4.0	6	11	57
GMG55050	GMG56050	R2.5	5.0	6	13	57
GMG55060	GMG56060	R3.0	6.0	6	13	57
GMG55080	GMG56080	R4.0	8.0	8	19	63
GMG55100	GMG56100	R5.0	10.0	10	22	72
GMG55120	GMG56120	R6.0	12.0	12	26	83
GMG55160	GMG56160	R8.0	16.0	16	32	92
GMG55200	GMG56200	R10.0	20.0	20	38	104
-	GMG56250	R12.5	25.0	25	38	104

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02	h5
Over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

V7 PLUS END MILLS

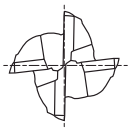
PLAIN SHANK **GMF58 SERIES**
FLAT SHANK **GMF59 SERIES**

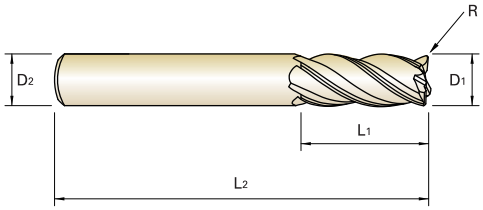
CARBIDE, 4 FLUTE CORNER RADIUS LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN ECKENRADIUS LANG
CARBURE, 4 DENTS, SÉRIE LONGUE, RAYONNÉE
MD, 4 TAGLIENTI SERIE LUNGA TORICA

▶Special flute geometry and multiple helix eliminate vibrations
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

▶Die spezielle Schneidengeometrie und der ungleiche Drall verhindern Vibrationen
▶Exzellente Leistung in Edelstählen, Baustählen, Guss und Stählen unter 40HRc





CARBIDE | 4 | 35°/37° | PLAIN | FLAT | Y Coating

p.C483

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
GMF58030	**GMF59030**	R0.3	**3.0**	6	8	57
GMF58901	**GMF59901**	R0.5	**3.0**	6	8	57
GMF58040	**GMF59040**	R0.3	**4.0**	6	11	57
GMF58902	**GMF59902**	R0.5	**4.0**	6	11	57
GMF58050	**GMF59050**	R0.3	**5.0**	6	13	57
GMF58903	**GMF59903**	R0.5	**5.0**	6	13	57
GMF58060	**GMF59060**	R0.3	**6.0**	6	13	57
GMF58904	**GMF59904**	R0.5	**6.0**	6	13	57
GMF58905	**GMF59905**	R1.0	**6.0**	6	13	57
GMF58080	**GMF59080**	R0.5	**8.0**	8	19	63
GMF58906	**GMF59906**	R1.0	**8.0**	8	19	63
GMF58100	**GMF59100**	R0.5	**10.0**	10	22	72
GMF58907	**GMF59907**	R1.0	**10.0**	10	22	72
GMF58120	**GMF59120**	R0.5	**12.0**	12	26	83
GMF58908	-	R1.0	**12.0**	12	26	83
GMF58909	**GMF59909**	R2.0	**12.0**	12	26	83
GMF58140	**GMF59140**	R0.5	**14.0**	14	26	83
GMF58160	**GMF59160**	R1.0	**16.0**	16	32	92
GMF58912	**GMF59912**	R2.0	**16.0**	16	32	92
GMF58913	**GMF59913**	R3.0	**16.0**	16	32	92
GMF58180	**GMF59180**	R1.0	**18.0**	18	32	92
GMF58200	**GMF59200**	R1.0	**20.0**	20	38	104
GMF58916	**GMF59916**	R2.0	**20.0**	20	38	104
GMF58917	**GMF59917**	R3.0	**20.0**	20	38	104
GMF58250	**GMF59250**	R1.0	**25.0**	25	38	104

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02	h5
Over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

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V7 PLUS END MILLS

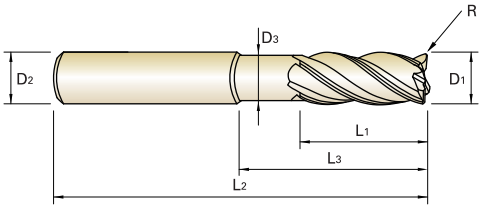
PLAIN SHANK **GMF62** SERIES
FLAT SHANK **GMF63** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN ECKENRADIUS mit ABGESETZTEM HALS
CARBURE, 4 DENTS, DÉTALONNÉE, RAYONNÉE
MD, 4 TAGLIENTI CON SCARICO ESTESO TORICA

- ▶Special flute geometry and multiple helix eliminate vibrations
- ▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

- ▶Die spezielle Schneidengeometrie und der ungleiche Drall verhindern Vibrationen
- ▶Exzellente Leistung in Edelstählen, Baustählen, Guss und Stählen unter 40HRc



CARBIDE | 4 | 35°/37° | PLAIN | FLAT | Y Coating

p.C483

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
PLAIN	FLAT	R	D1	D2	L1	L3	L2	D3
-	GMF63920	R1.0	8.0	8	12	30	73	7.5
GMF62921	GMF63921	R0.5	8.0	8	12	46	90	7.5
GMF62922	GMF63922	R1.0	8.0	8	12	46	90	7.5
GMF62100	-	R0.5	10.0	10	14	25	72	9.2
GMF62923	GMF63923	R1.0	10.0	10	14	25	72	9.2
GMF62924	GMF63924	R0.5	10.0	10	14	35	82	9.2
GMF62925	GMF63925	R1.0	10.0	10	14	35	82	9.2
GMF62926	GMF63926	R0.5	10.0	10	14	55	102	9.2
GMF62927	-	R1.0	10.0	10	14	55	102	9.2
GMF62120	GMF63120	R0.5	12.0	12	16	30	83	11.0
GMF62928	GMF63928	R1.0	12.0	12	16	30	83	11.0
GMF62929	GMF63929	R2.0	12.0	12	16	30	83	11.0
GMF62930	GMF63930	R0.5	12.0	12	16	40	93	11.0
GMF62931	GMF63931	R1.0	12.0	12	16	40	93	11.0
-	GMF63932	R2.0	12.0	12	16	40	93	11.0
GMF62935	-	R2.0	12.0	12	16	64	117	11.0
GMF62160	-	R1.0	16.0	16	22	38	92	15.0
GMF62936	GMF63936	R2.0	16.0	16	22	38	92	15.0
GMF62938	GMF63938	R1.0	16.0	16	22	55	109	15.0
GMF62939	-	R2.0	16.0	16	22	55	109	15.0
GMF62940	GMF63940	R3.0	16.0	16	22	55	109	15.0

▶ NEXT PAGE

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02	h5
Over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

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V7 PLUS END MILLS

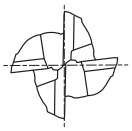
PLAIN SHANK **GMF52** SERIES
FLAT SHANK **GMF53** SERIES

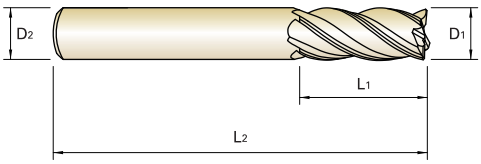
CARBIDE, 4 FLUTE SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
CARBURE, 4 DENTS, SÉRIE COURTE
MD, 4 TAGLIENTI SERIE CORTA

- ▶Special flute geometry and multiple helix eliminate vibrations
- ▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

- ▶Die spezielle Schneidengeometrie und der ungleiche Drall verhindern Vibrationen
- ▶Exzellente Leistung in Edelstählen, Baustählen, Guss und Stählen unter 40HRc





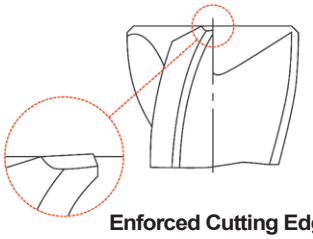
CARBIDE | 4 | 35°/37° | PLAIN | FLAT | C x 45° | Y Coating

p.C483

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
PLAIN	FLAT	D1	D2	L1	L2	
GMF52030	**GMF53030**	**3.0**	6	7	54	0.10
GMF52040	**GMF53040**	**4.0**	6	8	54	0.15
GMF52050	**GMF53050**	**5.0**	6	10	54	0.15
GMF52060	-	**6.0**	6	10	54	0.20
GMF52080	**GMF53080**	**8.0**	8	12	58	0.20
GMF52100	**GMF53100**	**10.0**	10	14	66	0.30
GMF52120	**GMF53120**	**12.0**	12	16	73	0.35
GMF52140	**GMF53140**	**14.0**	14	18	75	0.40
GMF52160	**GMF53160**	**16.0**	16	22	82	0.40
-	**GMF53180**	**18.0**	18	24	84	0.50
GMF52200	**GMF53200**	**20.0**	20	26	92	0.50

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02	h5
Over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

V7 PLUS END MILLS

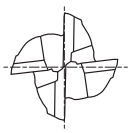
PLAIN SHANK **GMF60 SERIES**
FLAT SHANK **GMF61 SERIES**

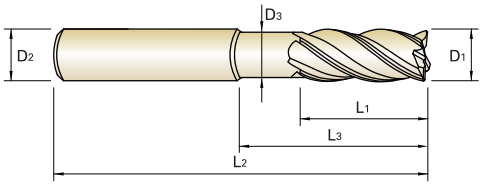
CARBIDE, 4 FLUTE with EXTENDED NECK

VOLLHARTMETALL, 4 SCHNEIDEN mit ABGESETZTEM HALS
CARBURE, 4 DENTS, DÉTALONNÉE
MD, 4 TAGLIENTI CON SCARICO ESTESO

- ▶Special flute geometry and multiple helix eliminate vibrations
- ▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

- ▶Die spezielle Schneidengeometrie und der ungleiche Drall verhindern Vibrationen
- ▶Exzellente Leistung in Edelstählen, Baustählen, Guss und Stählen unter 40HRc





CARBIDE | 4 | 35°/37° | PLAIN | FLAT | C x 45° | Y Coating

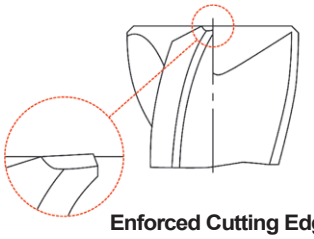
p.C483

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Chamfer
PLAIN	FLAT	D1	D2	L1	L3	L2	D3	
GMF60030	GMF61030	3.0	6	7	12	54	2.7	0.10
GMF60901	GMF61901	3.0	6	7	17	57	2.7	0.10
GMF60902	GMF61902	3.0	6	8	14	57	2.7	0.10
GMF60040	GMF61040	4.0	6	8	15	57	3.7	0.15
GMF60903	GMF61903	4.0	6	8	22	63	3.7	0.15
GMF60904	GMF61904	4.0	6	11	16	57	3.7	0.15
GMF60050	GMF61050	5.0	6	10	17	57	4.7	0.15
GMF60905	GMF61905	5.0	6	10	27	67	4.7	0.15
GMF60906	GMF61906	5.0	6	13	18	57	4.7	0.15
GMF60060	GMF61060	6.0	6	10	15	57	5.5	0.20
GMF60907	GMF61907	6.0	6	10	20	62	5.5	0.20
GMF60908	GMF61908	6.0	6	10	32	74	5.5	0.20
GMF60909	GMF61909	6.0	6	13	21	57	5.5	0.20
GMF60080	GMF61080	8.0	8	12	20	63	7.5	0.20
GMF60910	GMF61910	8.0	8	12	30	73	7.5	0.20
GMF60911	GMF61911	8.0	8	12	46	90	7.5	0.20
GMF60912	GMF61912	8.0	8	19	27	63	7.5	0.20
GMF60100	GMF61100	10.0	10	14	25	72	9.2	0.30
GMF60913	GMF61913	10.0	10	14	35	82	9.2	0.30
GMF60914	GMF61914	10.0	10	14	55	102	9.2	0.30
GMF60915	GMF61915	10.0	10	22	32	72	9.2	0.30

▶ NEXT PAGE

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02	h5
Over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

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V7 PLUS END MILLS

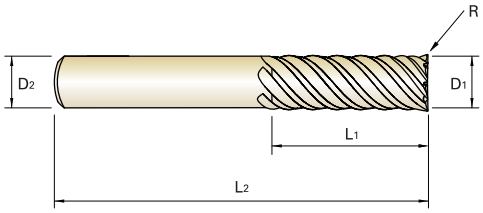
PLAIN SHANK **GMG16 SERIES**
FLAT SHANK **GMG17 SERIES**

CARBIDE, 6 FLUTE CORNER RADIUS LONG LENGTH

VOLLHARTMETALL, 6 SCHNEIDEN ECKENRADIUS LANG
CARBURE, 6 DENTS, SÉRIE LONGUE, RAYONNÉE
MD, 6 TAGLIENTI SERIE LUNGA TORICA

▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

▶Durch die einzigartige Geometrie und die ungleiche Teilung der Schneiden, eignet sich Fräser Bestens für hohe Bearbeitungsgeschwindigkeiten und trochiodales Fräsen.
▶Exzellente Leistung in Edelstählen, Baustählen, Guss und Stählen unter 40HRc



CARBIDE | 6 | 45° | PLAIN | FLAT | Y Coating

p.C484

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
GMG16060	**GMG17060**	R0.5	**6.0**	6	13	57
GMG16901	**GMG17901**	R1.0	**6.0**	6	13	57
GMG16080	**GMG17080**	R0.5	**8.0**	8	19	63
GMG16902	**GMG17902**	R1.0	**8.0**	8	19	63
GMG16100	**GMG17100**	R0.5	**10.0**	10	22	72
GMG16903	**GMG17903**	R1.0	**10.0**	10	22	72
GMG16904	**GMG17904**	R1.5	**10.0**	10	22	72
GMG16905	**GMG17905**	R2.0	**10.0**	10	22	72
GMG16120	**GMG17120**	R0.5	**12.0**	12	26	83
GMG16906	**GMG17906**	R1.0	**12.0**	12	26	83
GMG16907	**GMG17907**	R1.5	**12.0**	12	26	83
GMG16908	**GMG17908**	R2.0	**12.0**	12	26	83
GMG16909	**GMG17909**	R3.0	**12.0**	12	26	83
GMG16160	**GMG17160**	R1.0	**16.0**	16	32	92
-	**GMG17910**	R1.5	**16.0**	16	32	92
GMG16911	**GMG17911**	R2.0	**16.0**	16	32	92
GMG16912	**GMG17912**	R3.0	**16.0**	16	32	92
GMG16200	**GMG17200**	R1.0	**20.0**	20	38	104
GMG16913	**GMG17913**	R1.5	**20.0**	20	38	104
GMG16914	**GMG17914**	R2.0	**20.0**	20	38	104
GMG16915	**GMG17915**	R3.0	**20.0**	20	38	104
GMG16250	**GMG17250**	R1.0	**25.0**	25	44	104
GMG16916	**GMG17916**	R1.5	**25.0**	25	44	104
GMG16917	**GMG17917**	R2.0	**25.0**	25	44	104
GMG16918	**GMG17918**	R3.0	**25.0**	25	44	104

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02	h5
Over Ø12	0 ~ - 0.03	* Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

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V7 PLUS END MILLS

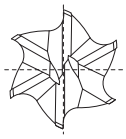
PLAIN SHANK **GMG18** SERIES
FLAT SHANK **GMG19** SERIES

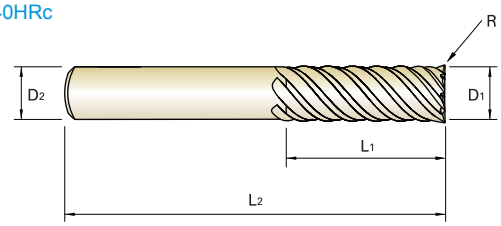
CARBIDE, 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH

VOLLHARTMETALL, 6 SCHNEIDEN ECKENRADIUS EXTRA LANG
CARBURE, 6 DENTS, SÉRIE EXTRA-LONGUE, RAYONNÉE
MD, 6 TAGLIENTI SERIE EXTRA LUNGA TORICA

▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

▶Durch die einzigartige Geometrie und die ungleiche Teilung der Schneiden, eignet sich Fräser Bestens für hohe Bearbeitungsgeschwindigkeiten und trochiodales Fräsen.
▶Exzellente Leistung in Edelstählen, Baustählen, Guss und Stählen unter 40HRc





CARBIDE | 6 | 45° | PLAIN | FLAT | Y Coating p.C484

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
GMG18250	-	R1.0	**25.0**	25	100	170
GMG18919	**GMG19919**	R1.5	**25.0**	25	100	170
GMG18922	**GMG19922**	R4.0	**25.0**	25	100	170
GMG18923	**GMG19923**	R5.0	**25.0**	25	100	170

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

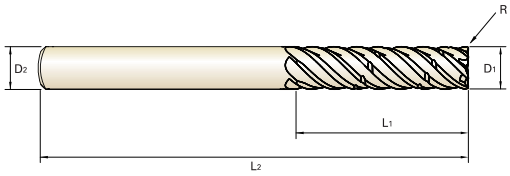
V7 PLUS END MILLS

PLAIN SHANK **GMH58** SERIES
FLAT SHANK **GMH59** SERIES

6 FLUTE CORNER RADIUS EXTRA LONG LENGTH CHIP SPLITTER

VOLLHARTMETALL,6 SCHNEIDEN ECKRADIUS EXTRA LANG SPANTEILER
CARBURE, 6 dents, extra-longue, fendeur des copeaux
MD, 6 TAGLIENTI, TORICA, SERIE EXTRA LUNGA CON ROMPI TRUCIOLO

- ▶Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶High Performance for Steels, Stainless Steels and Cast Iron
- ▶ Spezielles Spanteilerdesign für verbesserte Spanabfuhr durch kurze Späne bei hohem axialen Eingriff
- ▶ Hohe Leistung bei der Bearbeiting von Stählen, rostfreien Stählen und Gusseisen.



CARBIDE | 6 | 45° | PLAIN | FLAT | Y Coating

p.C485

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
GMH58917	**GMH59917**	R4.0	**20.0**	20	80	150
GMH58918	**GMH59918**	R5.0	**20.0**	20	80	150
GMH58250	**GMH59250**	R1.0	**25.0**	25	100	170
GMH58919	**GMH59919**	R1.5	**25.0**	25	100	170
GMH58920	**GMH59920**	R2.0	**25.0**	25	100	170
GMH58921	**GMH59921**	R3.0	**25.0**	25	100	170
GMH58922	**GMH59922**	R4.0	**25.0**	25	100	170
GMH58923	**GMH59923**	R5.0	**25.0**	25	100	170

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

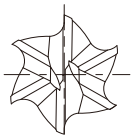
V7 PLUS END MILLS

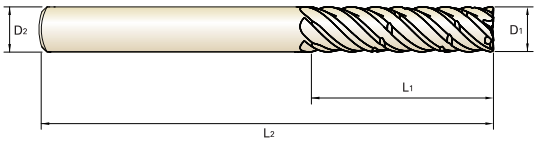
PLAIN SHANK **GMH56 SERIES**
FLAT SHANK **GMH57 SERIES**

CARBIDE, 6 FLUTE EXTRA LONG LENGTH CHIP SPLITTER

VOLLHARTMETALL, 6-SCHNEIDEN-SPANTEILER MIT EXTRA LANGER LÄNGE
Carbure, 6 Dents, Torique, Extra-Longue, Fendeur Des Copeaux
MD, 6 TAGLIENTI, SERIE EXTRA LUNGA CON ROMPI TRUCIOLO

- ▶Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶High Performance for Steels, Stainless Steels and Cast Iron
- ▶ Spezielles Spanteilerdesign für verbesserte Spanabfuhr durch kurze Späne bei hohem axialen Eingriff
- ▶ Hohe Leistung bei der Bearbeiting von Stählen, rostfreien Stählen und Gusseisen.





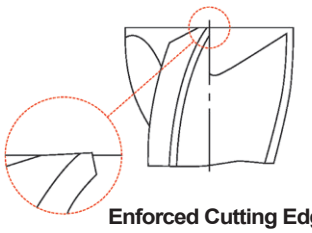
CARBIDE | 6 | 45° | PLAIN | FLAT | Y Coating

p.C485

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	D1	D2	L1	L2
GMH56060	-	**6.0**	6	24	75
GMH56080	**GMH57080**	**8.0**	8	32	75
GMH56100	**GMH57100**	**10.0**	10	40	100
-	**GMH57120**	**12.0**	12	48	120
GMH56160	**GMH57160**	**16.0**	16	64	140
-	**GMH57200**	**20.0**	20	80	150
GMH56250	**GMH57250**	**25.0**	25	100	170

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

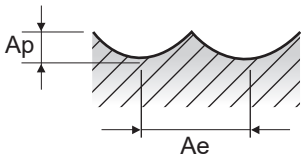
V7 PLUS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GMG55, GMG56 SERIES — 4 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.5D	1.0D	Vc	162	162	162	162	162	162	162	162	162	162	162
					fz	0.025	0.027	0.03	0.04	0.06	0.065	0.07	0.075	0.08	0.09	0.099
					RPM	17189	12892	10313	8594	6446	5157	4297	3223	2865	2578	2063
					FEED	1719	1392	1238	1375	1547	1341	1203	967	917	928	817
	5	Low alloy steel	0.5D	1.0D	Vc	113	113	113	113	113	113	113	113	113	113	113
					fz	0.025	0.027	0.03	0.04	0.06	0.065	0.07	0.074	0.079	0.09	0.099
					RPM	11990	8992	7194	5995	4496	3597	2997	2248	1998	1798	1439
					FEED	1199	971	863	959	1079	935	839	665	631	647	570
	6-7		0.5D	1.0D	Vc	162	162	162	162	162	162	162	162	162	162	162
					fz	0.025	0.027	0.03	0.04	0.06	0.065	0.07	0.075	0.08	0.09	0.099
					RPM	17189	12892	10313	8594	6446	5157	4297	3223	2865	2578	2063
					FEED	1719	1392	1238	1375	1547	1341	1203	967	917	928	817
	8-9		0.5D	1.0D	Vc	113	113	113	113	113	113	113	113	113	113	113
					fz	0.025	0.027	0.03	0.04	0.06	0.065	0.07	0.074	0.079	0.09	0.099
					RPM	11990	8992	7194	5995	4496	3597	2997	2248	1998	1798	1439
					FEED	1199	971	863	959	1079	935	839	665	631	647	570
	10-11.1	High alloyed steel, and tool steel	0.5D	1.0D	Vc	68	68	68	68	68	68	68	68	68	68	68
					fz	0.017	0.019	0.021	0.028	0.042	0.045	0.049	0.052	0.056	0.063	0.07
					RPM	7215	5411	4329	3608	2706	2165	1804	1353	1203	1082	866
					FEED	491	411	364	404	455	390	354	281	269	273	242
M	12-13	Stainless steel	0.5D	1.0D	Vc	77	77	77	77	77	77	77	77	77	77	77
					fz	0.015	0.015	0.025	0.03	0.04	0.045	0.05	0.054	0.059	0.058	0.059
					RPM	8170	6127	4902	4085	3064	2451	2042	1532	1362	1225	980
					FEED	490	368	490	490	490	441	408	331	321	284	231
	14.1		0.5D	1.0D	Vc	85	85	85	85	85	85	85	85	85	85	85
					fz	0.02	0.02	0.025	0.041	0.045	0.05	0.055	0.06	0.064	0.065	0.068
					RPM	9019	6764	5411	4509	3382	2706	2255	1691	1503	1353	1082
					FEED	722	541	541	740	609	541	496	406	385	352	294
	14.2		0.5D	1.0D	Vc	77	77	77	77	77	77	77	77	77	77	77
					fz	0.02	0.02	0.025	0.041	0.045	0.05	0.055	0.06	0.064	0.065	0.068
					RPM	8170	6127	4902	4085	3064	2451	2042	1532	1362	1225	980
					FEED	654	490	490	670	551	490	449	368	349	319	267
K	15-20	Grey cast iron	0.5D	1.0D	Vc	119	119	119	119	119	119	119	119	119	119	119
					fz	0.031	0.033	0.037	0.05	0.074	0.081	0.087	0.093	0.099	0.112	0.124
					RPM	12626	9470	7576	6313	4735	3788	3157	2367	2104	1894	1515
					FEED	1566	1250	1121	1263	1402	1227	1098	881	833	848	752
S	31-35	Heat Resistant Super Alloys	0.2D	0.3D	Vc	21	21	21	21	21	21	21	21	21	21	21
					fz	0.014	0.014	0.017	0.028	0.031	0.035	0.038	0.042	0.045	0.045	0.048
					RPM	2228	1671	1337	1114	836	668	557	418	371	334	267
					FEED	125	94	91	125	104	94	85	70	67	60	51
	36-37	Titanium Alloys	0.5D	0.3D	Vc	47	47	47	47	47	47	47	47	47	47	47
					fz	0.018	0.018	0.022	0.037	0.04	0.045	0.049	0.054	0.058	0.058	0.061
					RPM	4987	3740	2992	2493	1870	1496	1247	935	831	748	598
					FEED	359	269	263	369	299	269	244	202	193	174	146



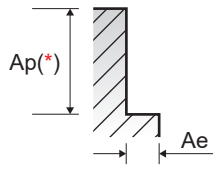
V7 PLUS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GMG16 GMG17 GMG18 GMG19 GMG12 GMG13 GMG14 GMG15 — **6 FLUTE - SIDE CUTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.05D	2.0D	Vc	300	300	300	300	300	300	300
					fz	0.068	0.116	0.144	0.173	0.202	0.225	0.232
					RPM	15915	11937	9549	7958	5968	4775	3820
					FEED	6494	8308	8251	8260	7234	6446	5317
	5	Low alloy steel	0.05D	2.0D	Vc	205	205	205	205	205	205	205
					fz	0.050	0.085	0.106	0.128	0.149	0.167	0.174
					RPM	10876	8157	6525	5438	4078	3263	2610
					FEED	3263	4160	4150	4176	3646	3269	2725
	6-7		0.05D	2.0D	Vc	300	300	300	300	300	300	300
					fz	0.068	0.116	0.144	0.173	0.202	0.225	0.232
					RPM	15915	11937	9549	7958	5968	4775	3820
					FEED	6494	8308	8251	8260	7234	6446	5317
	8-9		0.05D	2.0D	Vc	205	205	205	205	205	205	205
					fz	0.050	0.085	0.106	0.128	0.149	0.167	0.174
					RPM	10876	8157	6525	5438	4078	3263	2610
					FEED	3263	4160	4150	4176	3646	3269	2725
	10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	Vc	100	100	100	100	100	100	100
					fz	0.041	0.071	0.088	0.105	0.123	0.137	0.144
					RPM	5305	3979	3183	2653	1989	1592	1273
					FEED	1305	1695	1681	1671	1468	1308	1100
M	12-13	Stainless steel	0.05D	2.0D	Vc	215	215	215	215	215	215	215
					fz	0.049	0.084	0.104	0.125	0.146	0.162	0.168
					RPM	11406	8555	6844	5703	4277	3422	2737
					FEED	3353	4312	4270	4277	3747	3326	2759
	14.1		0.05D	2.0D	Vc	145	145	145	145	145	145	145
					fz	0.041	0.071	0.088	0.105	0.123	0.137	0.143
					RPM	7692	5769	4615	3846	2885	2308	1846
					FEED	1892	2458	2437	2423	2129	1897	1584
	14.2		0.05D	2.0D	Vc	135	135	135	135	135	135	135
					fz	0.041	0.071	0.088	0.105	0.123	0.137	0.142
					RPM	7162	5371	4297	3581	2686	2149	1719
					FEED	1762	2288	2269	2256	1982	1766	1464
K	15-20	Grey cast iron	0.05D	2.0D	Vc	225	225	225	225	225	225	225
					fz	0.082	0.139	0.173	0.208	0.242	0.270	0.278
					RPM	11937	8952	7162	5968	4476	3581	2865
					FEED	5844	7477	7426	7434	6510	5801	4785
S	31-35	Heat Resistant Super Alloys	0.05D	2.0D	Vc	35	35	35	35	35	35	35
					fz	0.033	0.055	0.070	0.082	0.097	0.112	0.115
					RPM	1857	1393	1114	928	696	557	446
					FEED	368	460	468	457	405	374	307
	36-37	Titanium Alloys	0.05D	2.0D	Vc	115	115	115	115	115	115	115
					fz	0.033	0.055	0.070	0.083	0.097	0.113	0.117
					RPM	6101	4576	3661	3050	2288	1830	1464
					FEED	1208	1510	1537	1519	1332	1241	1028



(*) : If product's Length of Cut(L.O.C) is below 2D, it must be applied with L.O.C x 90%

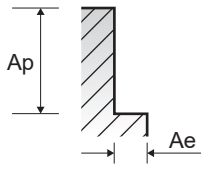
V7 INOX END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EMB72, EMB73 SERIES — 5 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-2	Non-alloy steel	0.25D	1.25D	Vc	135	135	135	135	135	135	135
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.089
					RPM	7162	5371	4297	3581	3069	2686	2149
					FEED	1218	1021	1074	1128	1059	1021	956
	6		0.25D	1.25D	Vc	135	135	135	135	135	135	135
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.089
					RPM	7162	5371	4297	3581	3069	2686	2149
					FEED	1218	1021	1074	1128	1059	1021	956
	10	High alloyed steel, and tool steel	0.25D	1.25D	Vc	135	135	135	135	135	135	135
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.089
					RPM	7162	5371	4297	3581	3069	2686	2149
					FEED	1218	1021	1074	1128	1059	1021	956
M	12-13	Stainless steel	0.25D	1.25D	Vc	105	105	105	145	105	105	105
					fz	0.030	0.032	0.038	0.043	0.064	0.068	0.076
					RPM	5570	4178	3342	3846	2387	2089	1671
					FEED	836	668	635	827	764	710	635
	14.1		0.25D	1.25D	Vc	115	115	115	115	115	115	115
					fz	0.030	0.032	0.038	0.063	0.065	0.069	0.076
					RPM	6101	4576	3661	3050	2615	2288	1830
					FEED	915	732	696	961	850	789	696
K	15-20	Grey cast iron	0.25D	1.25D	Vc	135	135	135	135	135	135	135
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.089
					RPM	7162	5371	4297	3581	3069	2686	2149
					FEED	1218	1021	1074	1128	1059	1021	956
S	31-35	Heat Resistant Super Alloys	0.25D	1.0D	Vc	25	25	25	25	25	25	25
					fz	0.017	0.020	0.025	0.036	0.045	0.048	0.060
					RPM	1326	995	796	663	568	497	398
					FEED	113	99	99	119	128	119	119
	36-37	Titanium Alloys	0.25D	1.25D	Vc	85	85	85	85	85	85	85
					fz	0.030	0.031	0.038	0.050	0.057	0.063	0.075
					RPM	4509	3382	2706	2255	1933	1691	1353
					FEED	676	524	514	564	551	533	507



Leading Through Innovation

SOLID CARBIDE

ALU-POWER HPC END MILLS

Alu Power HPC VHM Fräser

- For Aluminum, Aluminum Die Cast, Non-ferrous Alloys and Plastics
- Für Aluminium, Aluminiumdruckguss, Nichteisenlegierungen und Kunststoffe

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
ALU-POWER HPC END MILLS

3-Flute, High-Performance,
For Aluminum, Aluminum Die Cast,
Non-Ferrous Alloys And Plastics

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C500

SERIES	E5H24 JAH24	E5H25 JAH25	E5H22 JAH22	E5H23 JAH23
FLUTE	3	3	3	3
HELIX ANGLE	37°	37°	37°	37°
CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE
SIZE MIN	D6.0	D6.0	D3.0	D6.0
SIZE MAX	D20.0	D20.0	D25.0	D20.0
PAGE	C490	C493	C496	C497
	-	EXTENDED NECK	-	EXTENDED NECK
	Uncoated	Uncoated	Uncoated	Uncoated
	DLC	DLC	DLC	DLC

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125					
	2		About 0.45% C	Annealed	190	13				
	3		About 0.45% C	Quenched & Tempered	250	25				
	4		About 0.75% C	Annealed	270	28				
	5		About 0.75% C	Quenched & Tempered	300	32				
	6	Low alloy steel		Annealed	180	10				
	7			Quenched & Tempered	275	29				
	8			Quenched & Tempered	300	32				
	9			Quenched & Tempered	350	38				
	10	High alloyed steel, and tool steel		Annealed	200	15				
	11			Quenched & Tempered	325	35				
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎	◎	◎
	22		Curable	Hardened	100		◎	◎	◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎	◎	◎
	25		> 12% Si, Not Curable		130		○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○	○	○	○
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

ALU-POWER HPC END MILLS

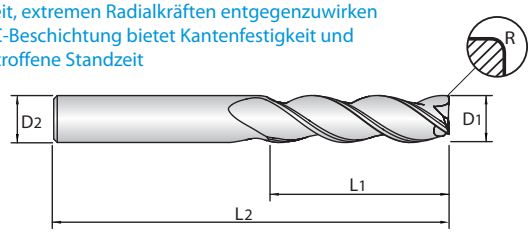
UNCOATED **E5H24** SERIES
DLC COATED **JAH24** SERIES
PLAIN SHANK

CARBIDE, 3 FLUTE 37° HELIX CORNER RADIUS

VOLLHARTMETALL, 3 SCHNEIDEN 37° ECKRADIUS
FRAISE CARBURE, 3 DENTS, TORIQUE, HÉLICE 37°
3 TAGLIENTI, ELICA 37°, SPIGOLO RAGGIATO

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life

- Ausgewogenes Fräsen, mit weniger Vibrationen
- Höhere Schnittgeschwindigkeiten möglich bei weniger Wärmeeinbringung in den Werkstoff Aluminium
- Effizientere Spanabfuhr
- Fähigkeit, extremen Radialkräften entgegenzuwirken
- Die DLC-Beschichtung bietet Kantenfestigkeit und unübertroffene Standzeit



CARBIDE | 3 | 37° | PLAIN | UNCOATED | DLC

p.C500

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	DLC	R	D1	D2	L1	L2
E5H24060	**JAH24060**	R0.5	**6.0**	6	13	57
E5H24901	**JAH24901**	R1.0	**6.0**	6	13	57
E5H24902	**JAH24902**	R1.5	**6.0**	6	13	57
E5H24903	**JAH24903**	R0.8	**6.0**	6	13	72
-	**JAH24904**	R1.2	**6.0**	6	13	72
E5H24905	**JAH24905**	R0.5	**6.0**	6	24	75
E5H24906	**JAH24906**	R1.0	**6.0**	6	24	75
E5H24080	**JAH24080**	R0.3	**8.0**	8	19	63
E5H24907	**JAH24907**	R0.5	**8.0**	8	19	63
E5H24908	**JAH24908**	R1.0	**8.0**	8	19	63
E5H24909	**JAH24909**	R1.5	**8.0**	8	19	63
E5H24910	**JAH24910**	R0.5	**8.0**	8	32	75
E5H24911	**JAH24911**	R1.0	**8.0**	8	32	75
E5H24912	**JAH24912**	R1.5	**8.0**	8	32	75
E5H24913	**JAH24913**	R2.0	**8.0**	8	32	75
E5H24100	**JAH24100**	R0.3	**10.0**	10	22	72
E5H24914	**JAH24914**	R0.5	**10.0**	10	22	72
E5H24915	**JAH24915**	R1.0	**10.0**	10	22	72
E5H24916	**JAH24916**	R1.5	**10.0**	10	22	72
E5H24917	**JAH24917**	R0.5	**10.0**	10	40	100

▶ NEXT PAGE

Mill Diameter Tolerences (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○	○												

ALU-POWER HPC END MILLS

UNCOATED **E5H24** SERIES
DLC COATED **JAH24** SERIES
PLAIN SHANK

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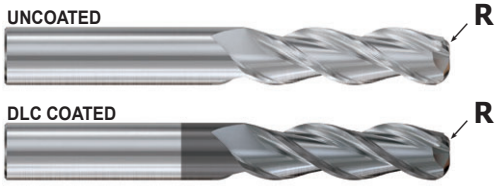

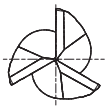

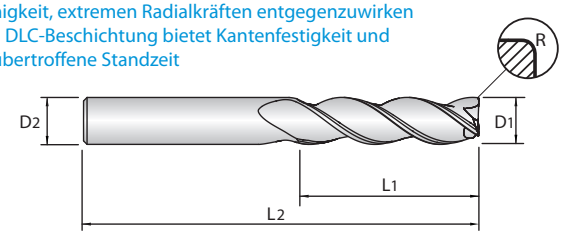

CARBIDE | 3 | 37° | PLAIN | UNCOATED | DLC

p.C500

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	DLC	R	D_1	D_2	L_1	L_2
E5H24935	**JAH24935**	R4.0	**16.0**	16	32	92
-	**JAH24936**	R0.5	**16.0**	16	64	125
E5H24937	**JAH24937**	R1.0	**16.0**	16	64	125
E5H24938	**JAH24938**	R1.5	**16.0**	16	64	125
E5H24939	**JAH24939**	R2.0	**16.0**	16	64	125
E5H24940	**JAH24940**	R2.5	**16.0**	16	64	125
E5H24941	**JAH24941**	R3.0	**16.0**	16	64	125
E5H24942	-	R4.0	**16.0**	16	64	125
E5H24200	**JAH24200**	R2.0	**20.0**	20	38	104
E5H24943	**JAH24943**	R2.5	**20.0**	20	38	104
E5H24944	**JAH24944**	R3.0	**20.0**	20	38	104
E5H24945	**JAH24945**	R4.0	**20.0**	20	38	104
E5H24946	**JAH24946**	R0.5	**20.0**	20	80	150
E5H24947	**JAH24947**	R1.0	**20.0**	20	80	150
E5H24948	**JAH24948**	R1.5	**20.0**	20	80	150
E5H24949	**JAH24949**	R2.0	**20.0**	20	80	150
E5H24950	**JAH24950**	R2.5	**20.0**	20	80	150
E5H24951	**JAH24951**	R3.0	**20.0**	20	80	150
E5H24952	**JAH24952**	R4.0	**20.0**	20	80	150

Mill Diameter Tolerences (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○	○												

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YG-1 CO., LTD.

ALU-POWER HPC END MILLS

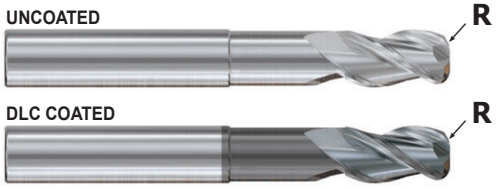
UNCOATED **E5H25** SERIES
DLC COATED **JAH25** SERIES
PLAIN SHANK

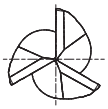
CARBIDE, 3 FLUTE 37° HELIX CORNER RADIUS with EXTENDED NECK

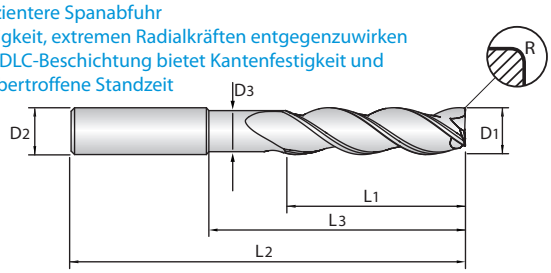
VOLLHARTMETALL, 3 SCHNEIDEN 37° ECKRADIUS MIT VERLÄNGERTEM HALS
FRAISE CARBURE, 3 DENTS, TORIQUE, HÉLICE 37°, DÉTALONNÉE, EXTRA-COURTE
3 TAGLIENTI , ELICA 37°, SPIGOLO RAGGIATO SCARICATA

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life

- Ausgewogenes Fräsen, mit weniger Vibrationen
- Höhere Schnittgeschwindigkeiten möglich bei weniger Wärmeeinbringung in den Werkstoff Aluminium
- Effizientere Spanabfuhr
- Fähigkeit, extremen Radialkräften entgegenzuwirken
- Die DLC-Beschichtung bietet Kantenfestigkeit und unübertroffene Standzeit







CARBIDE | 3 | 37° | PLAIN | UNCOATED | DLC

p.C500

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	DLC	R	D_1	D_2	L_1	L_3	L2	D3
E5H25916	**JAH25916**	R2.4	**10.0**	10	14	35	100	9.2
E5H25120	**JAH25120**	R0.5	**12.0**	12	16	40	100	11.0
E5H25917	**JAH25917**	R0.8	**12.0**	12	16	40	100	11.0
E5H25918	-	R1.0	**12.0**	12	16	40	100	11.0
E5H25919	**JAH25919**	R1.2	**12.0**	12	16	40	100	11.0
E5H25920	**JAH25920**	R1.5	**12.0**	12	16	40	100	11.0
E5H25921	**JAH25921**	R1.6	**12.0**	12	16	40	100	11.0
E5H25922	**JAH25922**	R2.0	**12.0**	12	16	40	100	11.0
E5H25923	**JAH25923**	R2.4	**12.0**	12	16	40	100	11.0
E5H25924	**JAH25924**	R2.5	**12.0**	12	16	40	100	11.0
E5H25925	**JAH25925**	R3.0	**12.0**	12	16	40	100	11.0
E5H25926	-	R4.0	**12.0**	12	16	40	100	11.0
E5H25140	**JAH25140**	R1.0	**14.0**	14	18	45	125	13.0
E5H25927	**JAH25927**	R2.0	**14.0**	14	18	45	125	13.0
E5H25928	**JAH25928**	R3.0	**14.0**	14	18	45	125	13.0
E5H25929	**JAH25929**	R4.0	**14.0**	14	18	45	125	13.0
E5H25160	**JAH25160**	R0.8	**16.0**	16	20	50	125	15.0
E5H25930	-	R1.2	**16.0**	16	20	50	125	15.0

▶ NEXT PAGE

Mill Diameter Tolerences (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○	○												

ALU-POWER HPC END MILLS

UNCOATED **E5H22 SERIES**
DLC COATED **JAH22 SERIES**
PLAIN SHANK

CARBIDE, 3 FLUTE 37° HELIX

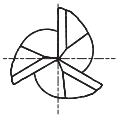
VOLLHARTMETALL, 3 SCHNEIDEN 37°
FRAISE CARBURE, TORIQUE, HÉLICE 37°
3 TAGLIENTI, ELICA 37°

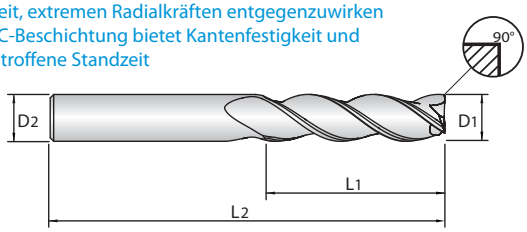
- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life

- Ausgewogenes Fräsen, mit weniger Vibrationen
- Höhere Schnittgeschwindigkeiten möglich bei weniger Wärmeeinbringung in den Werkstoff Aluminium
- Effizientere Spanabfuhr
- Fähigkeit, extremen Radialkräften entgegenzuwirken
- Die DLC-Beschichtung bietet Kantenfestigkeit und unübertroffene Standzeit

UNCOATED

DLC COATED





CARBIDE | 3 | 37° | PLAIN | UNCOATED | DLC

p.C501

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	DLC	D1	D2	L1	L2
E5H22030	**JAH22030**	**3.0**	6	8	52
E5H22040	**JAH22040**	**4.0**	6	11	55
E5H22050	**JAH22050**	**5.0**	6	13	57
E5H22060	**JAH22060**	**6.0**	6	13	57
E5H22901	**JAH22901**	**6.0**	6	13	72
E5H22902	-	**6.0**	6	24	75
E5H22080	**JAH22080**	**8.0**	8	19	63
E5H22903	**JAH22903**	**8.0**	8	32	75
E5H22100	**JAH22100**	**10.0**	10	22	72
E5H22904	**JAH22904**	**10.0**	10	40	100
E5H22120	**JAH22120**	**12.0**	12	26	83
E5H22905	**JAH22905**	**12.0**	12	48	100
E5H22140	**JAH22140**	**14.0**	14	30	89
E5H22160	**JAH22160**	**16.0**	16	32	92
E5H22906	**JAH22906**	**16.0**	16	64	125
E5H22200	**JAH22200**	**20.0**	20	38	104
E5H22907	**JAH22907**	**20.0**	20	80	150
E5H22250	**JAH22250**	**25.0**	25	50	125

Mill Diameter Tolerences (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○	○												

ALU-POWER HPC END MILLS

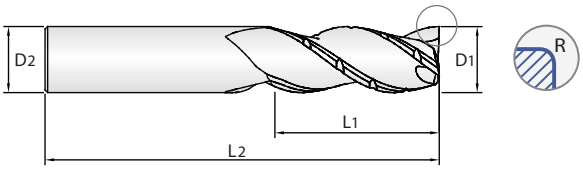
PLAIN SHANK **E5I86 SERIES**
FLAT SHANK **E5I87 SERIES**

CARBIDE, 3 FLUTE EXTENDED LENGTH - CHIP BREAKER

HARTMETALL, 3 SCHNEIDEN EXTRA LANG MIT SPANBRECHER
FRAISE CARBURE, 3 DENTS, LONGUEUR ÉTENDUE - BRISE-COPEAUX
FRESA MD, 3 TAGLIENTI, SERIE EXTRA LUNGA CON ROMPITRUCIOLO

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- Chip Breaker Improves chip evacuation by shortening the chip length
- Ability to counteract extreme radial forces

- Geschmeidiger Schnitt mit wenig Vibrationen
- Höhere Geschwindigkeiten bei geringerer Wärmeentwicklung in der Aluminiumbearbeitung
- Die Spanbrecher verbessern die Spanabfuhr durch Verkürzung der Spanlänge
- Hat die Fähigkeit, extremen Radialkräften entgegenzuwirken



CARBIDE | 3 | 37° | PLAIN | FLAT | UNCOATED

p.C502

Recommended ToolHolder

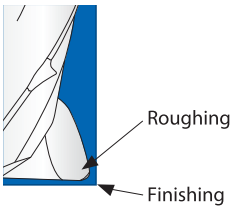
Flat Shank	Plain Shank
END MILL HOLDER	POWER MILLING CHUCK
-	HYDRAULIC CHUCK SHRINK FIT HOLDER
-	ER COLLET CHUCK

Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D_1	D_2	L_1	L_2
E5I86060	**E5I87060**	R0.25	6.0	6	13	57
E5I86902	**E5I87902**	R0.25	6.0	6	24	75
E5I86080	**E5I87080**	R0.25	8.0	8	19	63
E5I86905	**E5I87905**	R0.25	8.0	8	32	75
E5I86100	**E5I87100**	R0.5	10.0	10	22	72
E5I86908	**E5I87908**	R0.5	10.0	10	40	100
E5I86120	**E5I87120**	R0.5	12.0	12	26	83
E5I86911	**E5I87911**	R0.5	12.0	12	48	100
E5I86160	**E5I87160**	R1.0	16.0	16	32	92
E5I86914	**E5I87914**	R1.0	16.0	16	64	125
E5I86200	**E5I87200**	R1.0	20.0	20	38	104
E5I86917	**E5I87917**	R1.0	20.0	20	80	150

▶ NEXT PAGE

Mill Diameter Tolerences (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
ø6	+0/-0.008	h5
Over ø6 ~ up to ø10	+0/-0.009	
Over ø10 ~ up to ø16	+0/-0.011	
ø20	+0/-0.013	



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○	○												

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YG-1 CO., LTD.

ALU-POWER HPC END MILLS

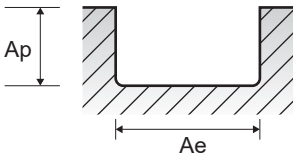
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E5H24, JAH24, E5H25, JAH25 SERIES

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

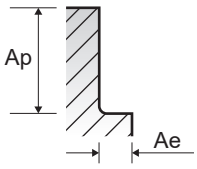
3 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	1.0D	1.0D	Vc	488	488	488	488	488
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	25889	15533	12945	9708	7767
					FEED	5918	5326	5918	4883	4439
	23~25	Aluminum-cast, alloyed	1.0D	1.0D	Vc	183	183	183	183	183
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	9708	5825	4854	3641	2913
					FEED	2219	1997	2219	1831	1665
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	Vc	268	268	268	268	268
					fz	0.051	0.102	0.127	0.140	0.152
					RPM	14218	8531	7109	5332	4265
					FEED	2167	2600	2708	2235	1950
	29.1	Non Metallic Materials	1.0D	1.0D	Vc	503	503	503	503	503
					fz	0.102	0.191	0.254	0.279	0.305
					RPM	26685	16011	13342	10007	8005
					FEED	8134	9150	10167	8388	7320



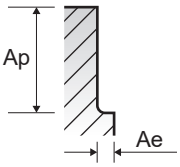
3 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	0.5D	1.5D	Vc	610	610	610	610	610
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	32361	19417	16181	12136	9708
					FEED	7398	6658	7398	6103	5548
	23~25	Aluminum-cast, alloyed	0.5D	1.5D	Vc	244	244	244	244	244
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	12945	7767	6472	4854	3883
					FEED	2959	2663	2959	2441	2219
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	1.5D	Vc	351	351	351	351	351
					fz	0.051	0.102	0.127	0.140	0.152
					RPM	18621	11173	9311	6983	5586
					FEED	2838	3405	3547	2927	2554
	29.1	Non Metallic Materials	0.5D	1.5D	Vc	625	625	625	625	625
					fz	0.102	0.191	0.254	0.279	0.305
					RPM	33157	19894	16579	12434	9947
					FEED	10106	11370	12633	10422	9096



3 FLUTE CORNER RADIUS - SIDE CUTTING HSM (Light)

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	0.05D	2.0D	Vc	1006	1006	1006	1006	1006
					fz	0.140	0.267	0.356	0.381	0.419
					RPM	53370	32022	26685	20014	16011
					FEED	22367	25621	28467	22876	20131
	23~25	Aluminum-cast, alloyed	0.05D	2.0D	Vc	366	366	366	366	366
					fz	0.140	0.267	0.356	0.381	0.419
					RPM	19417	11650	9708	7281	5825
					FEED	8138	9321	10357	8323	7324
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.05D	2.0D	Vc	564	564	564	564	564
					fz	0.114	0.216	0.292	0.330	0.356
					RPM	29921	17953	14961	11220	8976
					FEED	10260	11628	13110	11115	9576
	29.1	Non Metallic Materials	0.05D	2.0D	Vc	1021	1021	1021	1021	1021
					fz	0.229	0.432	0.584	0.635	0.699
					RPM	54166	32499	27083	20312	16250
					FEED	37147	42100	47465	38695	34051



ALU-POWER HPC END MILLS

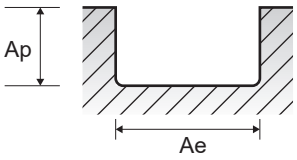
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E5186, E5187 SERIES

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

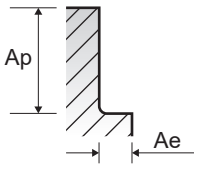
3 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	1.0D	1.0D	Vc	488	488	488	488	488
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	25889	15533	12945	9708	7767
					FEED	5918	5326	5918	4883	4439
	23~25	Aluminum-cast, alloyed	1.0D	1.0D	Vc	183	183	183	183	183
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	9708	5825	4854	3641	2913
					FEED	2219	1997	2219	1831	1665
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	Vc	268	268	268	268	268
					fz	0.051	0.102	0.127	0.14	0.152
					RPM	14218	8531	7109	5332	4265
					FEED	2167	2600	2708	2235	1950
	29.1	Non Metallic Materials	1.0D	1.0D	Vc	503	503	503	503	503
					fz	0.102	0.191	0.254	0.279	0.305
					RPM	26685	16011	13342	10007	8005
					FEED	8134	9150	10167	8388	7320



3 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	0.5D	1.5D	Vc	610	610	610	610	610
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	32361	19417	16181	12136	9708
					FEED	7398	6658	7398	6103	5548
	23~25	Aluminum-cast, alloyed	0.5D	1.5D	Vc	244	244	244	244	244
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	12945	7767	6472	4854	3883
					FEED	2959	2663	2959	2441	2219
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	1.5D	Vc	351	351	351	351	351
					fz	0.051	0.102	0.127	0.14	0.152
					RPM	18621	11173	9311	6983	5586
					FEED	2838	3405	3547	2927	2554
	29.1	Non Metallic Materials	0.5D	1.5D	Vc	625	625	625	625	625
					fz	0.102	0.191	0.254	0.279	0.305
					RPM	33157	19894	16579	12434	9947
					FEED	10106	11370	12633	10422	9096



Leading Through Innovation

SOLID CARBIDE

ALU-POWER END MILLS

Alu - Power Fräser

- For Aluminium Alloys and Chatter Free Cutting
- Für Aluminiumlegierungen und weichen Schnitt

SELECTION GUIDE

YG MILLING TOOLS

SERIES	E5910	E5908	E5909
FLUTE	2	3	2
HELIX ANGLE	50°	40°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	CORNER RADIUS
SIZE MIN	R3.0	R1.0	D4.0
SIZE MAX	R10.0	R8.0	D20.0
PAGE	C506	C507	C508
	NECK	NECK	NECK
	Uncoated	Uncoated	Uncoated

SOLID CARBIDE
ALU POWER END MILLS

Aluminium Alloys and Silent Cutting

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C518

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125				
	2		About 0.45% C	Annealed	190	13			
	3		About 0.45% C	Quenched & Tempered	250	25			
	4		About 0.75% C	Annealed	270	28			
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10			
	7			Quenched & Tempered	275	29			
	8			Quenched & Tempered	300	32			
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15			
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10			
	16		Pearlitic (Martensitic)		260	26			
	17	Nodular cast iron	Ferritic		160	3			
	18		Pearlitic		250	25			
	19	Malleable cast iron	Ferritic		130				
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎	◎
	22		Curable	Hardened	100		◎	◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎	◎
	25		> 12% Si, Not Curable		130		○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

ALU-POWER END MILLS

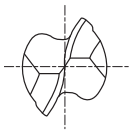
PLAIN SHANK **E5910 SERIES**

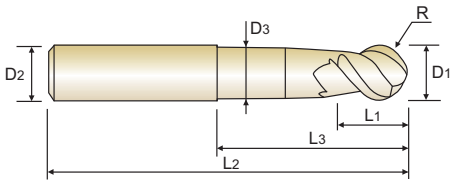
CARBIDE, 2 FLUTE 50° HELIX BALL NOSE with NECK

VOLLHARTMETALL, 2 SCHNEIDEN 50° RECHTSSPIRALE_STIRNRADIUS MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE, HÉLICE 50°, DÉTALONNÉE
2 TAGLIENTI, ELICA 50°, SEMISFERICA, SCARICATA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish

- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.





CARBIDE | 2 | 50° | R ±0.02 | PLAIN | UNCOATED p.C518

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R(±0.02)	D1	D2	L1	L3	L2	D3
E5910060	R3.0	**6.0**	6	5.5	25	55	5.4
E5910080	R4.0	**8.0**	8	7	30	65	7.2
E5910100	R5.0	**10.0**	10	8.5	35	75	9
E5910120	R6.0	**12.0**	12	10.5	40	75	11
E5910160	R8.0	**16.0**	16	14	50	90	14.5
E5910200	R10.0	**20.0**	20	17	50	100	18

▶ TiN, TiCN and TiAlN Coatings are available on your request.

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
± 0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○													

ALU-POWER END MILLS

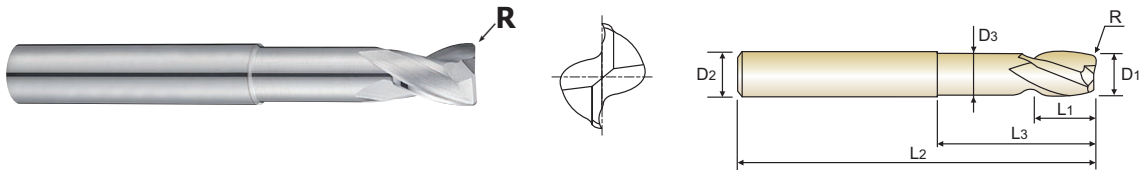
PLAIN SHANK **E5909 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS with NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, TORIQUE, DÉTALONNÉE
2 TAGLIENTI, TORICA, SCARICATA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish
- ▶ Superior chip evacuation
- ▶ Reduces chipping of corner edges

- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.
- ▶ Überlegene Spanabfuhr
- ▶ Reduzierung von Schneideckenausbrüchen.



p.C519

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R(±0.01)	D1	D2	L1	L3	L2	D3
E5909040	R0.3	**4.0**	6.0	5	10	50	3.6
E5909060	R0.5	**6.0**	6.0	8	20	60	5.4
E5909080	R0.6	**8.0**	8.0	10	30	70	7.2
E5909100	R0.8	**10.0**	10.0	12	36	80	9
E5909120	R1.0	**12.0**	12.0	14	40	90	11
E5909160	R1.3	**16.0**	16.0	18	45	100	14.5
E5909200	R1.6	**20.0**	20.0	24	45	100	18

▶ TiN, TiCN and TiAlN Coatings are available on your request.

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○	○	○	○													

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ALU-POWER END MILLS

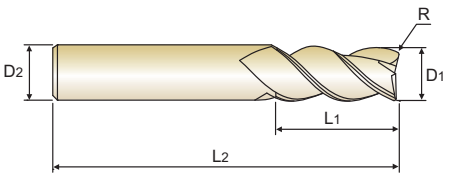
PLAIN SHANK **E5E51 SERIES**

CARBIDE, 3 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS

VOLLHARTMETALL, 3 SCHNEIDEN 45° RECHTSSPIRALE LANG ECKENRADIUS
FRAISE CARBURE, 3 DENTS, TORIQUE, HÉLICE 45°, LONGUE
3 TAGLIENTI, ELICA 45°, TORICA, SERIE LUNGA

- Excellent cutting qualities on aluminum and copper
- Increased tool life and higher cutting accuracy
- Mirror surface - Excellent surface finish
- Superior chip evacuation
- Reduces chipping of corner edges

- Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.
- Überlegene Spanabfuhr
- Reduzierung von Schneideckenausbrüchen.



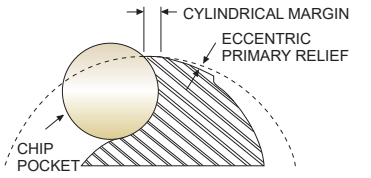
CARBIDE | 3 | 45° | PLAIN | UNCOATED p.C519

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
E5E51030	R0.5	3.0	6	12	57
E5E51901	R1.0	3.0	6	12	57
E5E51040	R0.5	4.0	6	15	57
E5E51902	R1.0	4.0	6	15	57
E5E51050	R0.5	5.0	6	20	57
E5E51903	R1.0	5.0	6	20	57
E5E51060	R0.5	6.0	6	20	65
E5E51904	R1.0	6.0	6	20	65
E5E51080	R0.5	8.0	8	22	65
E5E51905	R1.0	8.0	8	22	65
E5E51100	R0.5	10.0	10	25	70
E5E51906	R1.0	10.0	10	25	70
E5E51907	R2.0	10.0	10	25	70
E5E51120	R0.5	12.0	12	25	75
E5E51908	R1.0	12.0	12	25	75
E5E51909	R2.0	12.0	12	25	75
E5E51160	R0.5	16.0	16	35	90
E5E51910	R1.0	16.0	16	35	90
E5E51911	R2.0	16.0	16	35	90
E5E51200	R0.5	20.0	20	40	100
E5E51912	R1.0	20.0	20	40	100
E5E51913	R2.0	20.0	20	40	100

- TiN, TiCN and TiAlN Coatings are available on your request.

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.015	h5



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○																

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YG-1 CO., LTD.

ALU-POWER END MILLS

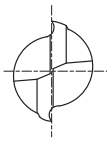
PLAIN SHANK **E5E48 SERIES**

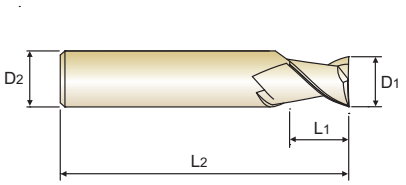
CARBIDE, 2 FLUTE 45° HELIX SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN 45° RECHTSSPIRALE KURZ
FRAISE CARBURE, 2 DENTS, HÉLICE 45°, COURTE
2 TAGLIENTI, ELICA 45°, SERIE CORTA

- Suitable for high speed machining in aluminum and other non-ferrous materials
- Mirror surface - Excellent surface finish
- Superior chip evacuation

- Zur HSC- Bearbeitung von Aluminium und anderen Nichteisenmetallen.
- Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.
- Überlegene Spanabfuhr





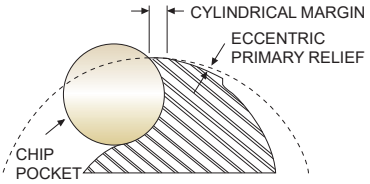
CARBIDE | 2 | 45° | PLAIN | UNCOATED p.C520

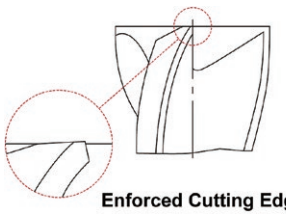
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
E5E48030	3.0	6	5	50
E5E48040	4.0	6	8	54
E5E48050	5.0	6	9	54
E5E48060	6.0	6	10	54
E5E48080	8.0	8	12	58
E5E48100	10.0	10	14	66
E5E48120	12.0	12	16	73
E5E48140	14.0	14	18	75
E5E48160	16.0	16	22	82
E5E48180	18.0	18	24	84
E5E48200	20.0	20	26	92

▶ TiN, TiCN and TiAlN Coatings are available on your request.

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.015	h5





Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○																

ALU-POWER END MILLS

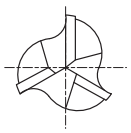
PLAIN SHANK **E5E49 SERIES**

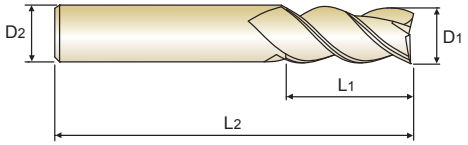
CARBIDE, 3 FLUTE 45° HELIX LONG LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN 45° RECHTSSPIRALE LANG
FRAISE CARBURE, 3 DENTS, HÉLICE 45°, LONGUE
3 TAGLIENTI, ELICA 45°, SERIE LUNGA

- ▶ Excellent cutting qualities on aluminum and copper
- ▶ Increased tool life and higher cutting accuracy
- ▶ Mirror surface - Excellent surface finish
- ▶ Superior chip evacuation

- ▶ Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- ▶ Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- ▶ Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.
- ▶ Überlegene Spanabfuhr





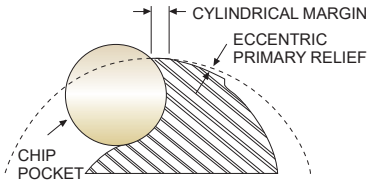
CARBIDE | 3 | 45° | PLAIN | UNCOATED p.C521

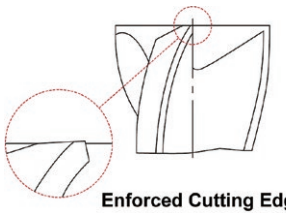
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
E5E49030	3.0	6	12	57
E5E49040	4.0	6	15	57
E5E49050	5.0	6	20	57
E5E49060	6.0	6	20	65
E5E49080	8.0	8	22	65
E5E49100	10.0	10	25	70
E5E49120	12.0	12	25	75
E5E49160	16.0	16	35	90
E5E49200	20.0	20	40	100

▶ TiN, TiCN and TiAlN Coatings are available on your request.

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.015	h5





Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○																

ALU-POWER END MILLS

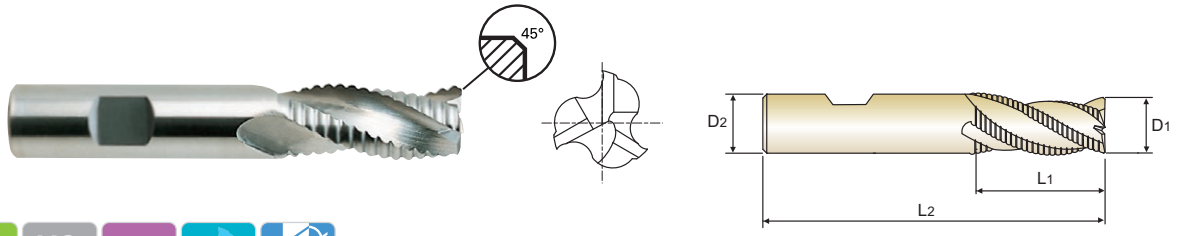
PLAIN SHANK **E5742 SERIES**
FLAT SHANK **E5711 SERIES**

CARBIDE, 3 FLUTE LONG LENGTH ROUGHING

VOLLHARTMETALL, 3 SCHNEIDEN LANG SCHRUPPFRÄSER
FRAISE CARBURE, 3 DENTS, ÉBAUCHE, LONGUE
3 TAGLIENTI, PER SGROSSATURA, SERIE LUNGA

- Excellent cutting qualities on aluminum and copper
- Increased tool life and higher cutting accuracy
- Mirror surface - Excellent surface finish

- Ausgezeichnete Schneideigenschaften in Aluminium, Kupfer
- Verbesserte Standzeiten und höhere Fräsgenauigkeit.
- Spiegel-Oberfläche - Hervorragendes Oberflächenfinishing.



CARBIDE | YG STD | WR | 3 | 30° | DIN 6535HA | DIN 6535HB | C x 45° | UNCOATED

p.C521

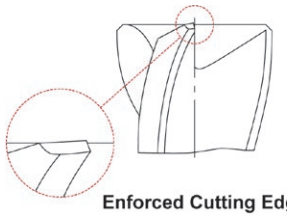
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall engtth	Chamfer
PLAIN	FLAT	D1	D2	L1	L2	
E5742060	**E5711060**	**6.0**	6	16	57	0.60
E5742070	**E5711070**	**7.0**	8	16	63	0.60
E5742080	**E5711080**	**8.0**	8	16	63	0.60
E5742090	**E5711090**	**9.0**	10	19	72	0.60
E5742100	**E5711100**	**10.0**	10	22	72	0.60
E5742120	**E5711120**	**12.0**	12	26	83	0.60
E5742140	**E5711140**	**14.0**	14	26	83	0.91
E5742160	**E5711160**	**16.0**	16	32	92	0.91
E5742180	**E5711180**	**18.0**	18	32	92	0.91
E5742200	**E5711200**	**20.0**	20	38	104	0.91
E5742250	-	**25.0**	25	45	121	0.91

- TiN, TiCN and TiAlN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛					
Nominal-Diameter in ㎜					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
h5	0 - 4	0 - 5	0 - 6	0 - 8	0 - 9



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○		○	○			○					○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○																

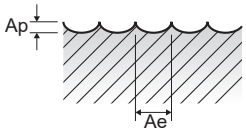
ALU-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

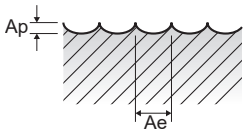
E5910 SERIES — 2 FLUTE BALL

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	0.2D	0.5D	Vc	270	280	350	420	440	350
					fz	0.049	0.071	0.084	0.107	0.123	0.157
					RPM	14324	11141	11141	11141	8754	5570
					FEED	1404	1582	1872	2384	2153	1749
	23~24	Aluminum-cast, alloyed	0.2D	0.5D	Vc	176	182	228	273	286	228
					fz	0.049	0.071	0.084	0.107	0.123	0.157
					RPM	9311	7242	7242	7242	5690	3621
					FEED	912	1028	1217	1550	1400	1137
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.2D	0.5D	Vc	85	85	105	125	135	105
					fz	0.04	0.06	0.069	0.089	0.101	0.131
					RPM	4509	3382	3342	3316	2686	1671
					FEED	361	406	461	590	543	438



E5908 SERIES — 3 FLUTE BALL

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	2.5	3.0	3.5	4.0	5.0	6.0	8.0	10.0	12.0	16.0
N	21~22	Aluminum-wrought alloy	0.2D	0.5D	Vc	135	140	135	160	180	225	270	280	350	420	440
					fz	0.018	0.022	0.026	0.028	0.035	0.038	0.049	0.071	0.084	0.107	0.123
					RPM	21486	17825	14324	14551	14324	14324	14324	11141	11141	11141	8754
					FEED	1160	1176	1117	1222	1504	1633	2106	2373	2807	3576	3230
	23~24	Aluminum-cast, alloyed	0.2D	0.5D	Vc	88	91	88	104	117	146	176	182	228	273	286
					fz	0.018	0.022	0.026	0.028	0.035	0.038	0.049	0.071	0.084	0.107	0.123
					RPM	13966	11586	9311	9458	9311	9311	9311	7242	7242	7242	5690
					FEED	754	765	726	795	978	1061	1369	1542	1825	2325	2100
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.2D	0.5D	Vc	40	40	40	50	55	70	85	85	105	125	135
					fz	0.015	0.018	0.022	0.022	0.028	0.031	0.04	0.06	0.069	0.089	0.101
					RPM	6366	5093	4244	4547	4377	4456	4509	3382	3342	3316	2686
					FEED	286	275	280	300	368	414	541	609	692	885	814



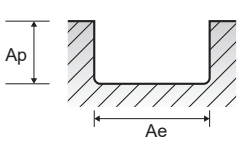
E5930 SERIES

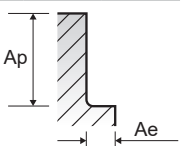
2 FLUTE CORNER RADIUS - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	1.0D	0.5D	Vc	65	100	130	165	195	200	250	300	320	250
					fz	0.022	0.035	0.046	0.05	0.058	0.09	0.11	0.135	0.156	0.2
					RPM	10345	10610	10345	10504	10345	7958	7958	7958	6366	3979
					FEED	455	743	952	1050	1200	1432	1751	2149	1986	1592
	23~24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	42	65	85	107	127	130	163	195	208	163
					fz	0.022	0.035	0.046	0.05	0.058	0.09	0.11	0.135	0.156	0.2
					RPM	6724	6897	6724	6828	6724	5173	5173	5173	4138	2586
					FEED	296	483	619	683	780	931	1138	1397	1291	1035

2 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	Ø2~Ø10=0.25D Ø12~Ø20=0.5D	1.0D	Vc	65	100	130	165	195	200	250	300	320	250
					fz	0.039	0.046	0.054	0.065	0.077	0.115	0.135	0.170	0.194	0.250
					RPM	10345	10610	10345	10504	10345	7958	7958	7958	6366	3979
					FEED	807	976	1117	1366	1593	1830	2149	2706	2470	1989
	23~24	Aluminum-cast, alloyed	Ø2~Ø10=0.25D Ø12~Ø20=0.5D	1.0D	Vc	42	65	85	107	127	130	163	195	208	163
					fz	0.039	0.046	0.054	0.065	0.077	0.115	0.135	0.170	0.194	0.250
					RPM	6724	6897	6724	6828	6724	5173	5173	5173	4138	2586
					FEED	524	634	726	888	1036	1190	1397	1759	1606	1293





ALU-POWER END MILLS

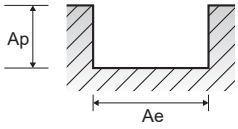
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

E5E47 SERIES

1 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
N	21~22	Aluminum-wrought alloy	1.0D	1.5D	Vc	145	170	190	190	190	195	190	190
					fz	0.065	0.094	0.120	0.150	0.180	0.244	0.333	0.440
					RPM	23077	18038	15120	12096	10080	7759	6048	5040
					FEED	1500	1696	1814	1814	1814	1893	2014	2218
	23~24	Aluminum-cast, alloyed	1.0D	1.5D	Vc	94	111	124	124	124	127	124	124
					fz	0.065	0.094	0.120	0.150	0.180	0.244	0.333	0.440
					RPM	15000	11724	9828	7862	6552	5043	3931	3276
					FEED	975	1102	1179	1179	1179	1231	1309	1441
	29.1	Non Metallic Materials (Duroplastic)	1.0D	1.5D	Vc	200	235	250	235	255	250	250	255
					fz	0.069	0.096	0.120	0.147	0.170	0.240	0.300	0.343
					RPM	31831	24934	19894	14961	13528	9947	7958	6764
					FEED	2196	2394	2387	2199	2300	2387	2387	2320



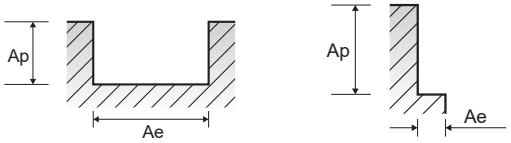
E5E48, E5522, E5521 SERIES

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21~22	Aluminum-wrought alloy	1.0D	0.5D	Vc	95	125	155	190	200	250	300	265	300	225	250
					fz	0.035	0.045	0.050	0.060	0.088	0.106	0.131	0.150	0.158	0.175	0.200
					RPM	10080	9947	9868	10080	7958	7958	7958	6025	5968	3979	3979
					FEED	706	895	987	1210	1401	1687	2085	1808	1886	1393	1592
	23~24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	62	81	101	124	130	163	195	172	195	146	163
					fz	0.035	0.045	0.050	0.060	0.088	0.106	0.131	0.150	0.158	0.175	0.200
					RPM	6552	6466	6414	6552	5173	5173	5173	3916	3879	2586	2586
					FEED	459	582	641	786	910	1097	1355	1175	1226	905	1035

2 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21~22	Aluminum-wrought alloy	Ø3~Ø10=0.25D Ø12~Ø20=0.5D	1.0D	Vc	95	125	155	190	200	250	300	265	300	225	250
					fz	0.045	0.055	0.065	0.075	0.113	0.131	0.163	0.183	0.200	0.225	0.238
					RPM	10080	9947	9868	10080	7958	7958	7958	6025	5968	3979	3979
					FEED	907	1094	1283	1512	1798	2085	2594	2205	2387	1790	1894
	23~24	Aluminum-cast, alloyed	Ø3~Ø10=0.25D Ø12~Ø20=0.5D	1.0D	Vc	62	81	101	124	130	163	195	172	195	146	163
					fz	0.045	0.055	0.065	0.075	0.113	0.131	0.163	0.183	0.200	0.225	0.238
					RPM	6552	6466	6414	6552	5173	5173	5173	3916	3879	2586	2586
					FEED	590	711	834	983	1169	1355	1686	1433	1552	1164	1231



Global Cutting Tool Leader **YG-1**

MILLING

Leading Through Innovation

SOLID CARBIDE

D-POWER GRAPHITE END MILLS

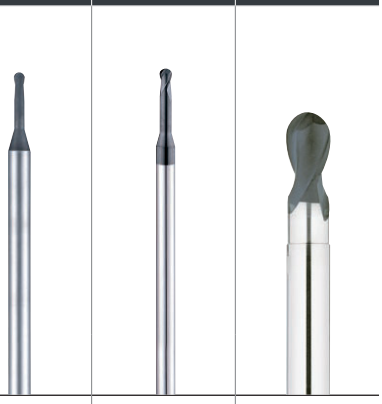
D - POWER Graphit VHM - Fräser

- For Graphite
- Für Graphite

SELECTION GUIDE

YG MILLING TOOLS

SERIES	EI997	EIB93	EI880
FLUTE	2	2	2
HELIX ANGLE	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R0.1	R0.2	R1.0
SIZE MAX	R3.0	R2.0	R6.0
PAGE	C526	C528	C529
	MINIATURE NECK	MINIATURE NECK	SHORT LENGTH NECK
	Diamond	Diamond	Diamond



SOLID CARBIDE
D-POWER for GRAPHITE END MILLS

High performance on graphite

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C541

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125				
	2		About 0.45% C	Annealed	190	13			
	3		About 0.45% C	Quenched & Tempered	250	25			
	4		About 0.75% C	Annealed	270	28			
	5		About 0.75% C	Quenched & Tempered	300	32			
	6	Low alloy steel		Annealed	180	10			
	7			Quenched & Tempered	275	29			
	8			Quenched & Tempered	300	32			
	9			Quenched & Tempered	350	38			
	10	High alloyed steel, and tool steel		Annealed	200	15			
	11			Quenched & Tempered	325	35			
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10			
	16		Pearlitic (Martensitic)		260	26			
	17	Nodular cast iron	Ferritic		160	3			
	18		Pearlitic		250	25			
	19	Malleable cast iron	Ferritic		130				
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○
	22		Curable	Hardened	100		○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○	○
	25		> 12% Si, Not Curable		130		○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29.1	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	29.2		Graphite				◎	◎	◎
	29.3		CFRP, GFRP						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

D-POWER GRAPHITE END MILLS

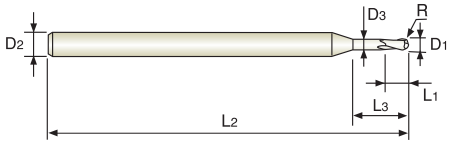
PLAIN SHANK **EI997 SERIES**

CARBIDE, 2 FLUTE MINIATURE BALL NOSE with NECK

VOLLHARTMETALL, 2 SCHNEIDEN MINI STIRNRADIUS MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE, DÉTALONNÉE, MICRO-FRAISE
2 TAGLIENTI, SEMISFERICA, SERIE MINI, SCARICATA

- Higher hardness of film and excellent wear-resistance increase the tool life surprisingly.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc. YG-1's diamond coated carbide ball end mills have good result for the machining of non-ferrous metals and non-metallic materials.

- Höhere Härte der Beschichtung und ausgezeichnete Verschleißfestigkeit verlängern die Standzeit beachtlich.
- Ultrafeiner Film auf YG-1 Diamant - beschichteten Hartmetall Schaftfräser gewährleisten eine glatte und ausgezeichnete Oberflächengüte.
- Hohe Leistungsfähigkeit bei Graphit, Aluminium ohne Silicon, Bakelit, Plastik, Holz, Messing, etc. YG-1 Diamant - beschichtete Hartmetall Schaftfräser zeigen gute Ergebnisse beim Bearbeiten von NE - Metallen und Nichtmetall - Werkstoffen.



CARBIDE | 2 | 30° | R ±0.01 | PLAIN | Diamond

p.C541

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.01)	D_1	D_2	L_1	L_3	L_2	D_3
EI997002000040	R0.1	**0.2**	3	0.2	-	40	-
EI997003000040	R0.15	**0.3**	3	0.3	-	40	-
EI997004000040	R0.2	**0.4**	3	0.4	-	40	-
EI997005025040	R0.25	**0.5**	3	0.5	2.5	40	0.45
EI997006	R0.3	**0.6**	3	0.6	3	40	0.55
EI997006050040	R0.3	**0.6**	3	0.6	5	40	0.55
EI997008	R0.4	**0.8**	3	0.8	4	40	0.75
EI997008070040	R0.4	**0.8**	3	0.8	7	40	0.75
EI997010	R0.5	**1.0**	3	1	5	40	0.95
EI997903	R0.5	**1.0**	3	1	8.5	40	0.95
EI997010120040	R0.5	**1.0**	3	1	12	40	0.95
EI997012	R0.6	**1.2**	3	1.2	6	50	1.15
EI997012100050	R0.6	**1.2**	3	1.2	10	50	1.15
EI997015	R0.75	**1.5**	3	1.5	7.5	50	1.4
EI997906	R0.75	**1.5**	3	1.5	12	50	1.4
EI997015180050	R0.75	**1.5**	3	1.5	18	50	1.4
EI997020	R1.0	**2.0**	3	2.2	10	60	1.9
EI997908	R1.0	**2.0**	3	2.2	16	60	1.9
EI997020250060	R1.0	**2.0**	3	2.2	25	60	1.9
EI997030100065	R1.5	**3.0**	4	3	10	65	2.9
EI997030150065	R1.5	**3.0**	4	3	15	65	2.9
EI997030200065	R1.5	**3.0**	4	3	20	65	2.9
EI997030250075	R1.5	**3.0**	4	3	25	75	2.9
EI997030300075	R1.5	**3.0**	4	3	30	75	2.9

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○				◎												

D-POWER GRAPHITE END MILLS

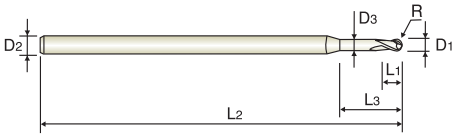
PLAIN SHANK **EIB93 SERIES**

CARBIDE, 2 FLUTE MINIATURE BALL NOSE with NECK

VOLLHARTMETALL, 2 SCHNEIDEN MINI STIRNRADIUS MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE, DÉTALONNÉE, MICRO-FRAISE
2 TAGLIENTI, SEMISFERICA, SERIE MINI, SCARICATA

- Higher hardness of film and excellent wear-resistance increase the tool life surprisingly.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc. YG-1's diamond coated carbide ball end mills have good result for the machining of non-ferrous metals and non-metallic materials.

- Höhere Härte der Beschichtung und ausgezeichnete Verschleißfestigkeit verlängern die Standzeit beachtlich.
- Ultrafeiner Film auf YG-1 Diamant - beschichteten Hartmetall Schaftfräser gewährleisten eine glatte und ausgezeichnete Oberflächengüte.
- Hohe Leistungsfähigkeit bei Graphit, Aluminium ohne Silicon, Bakelit, Plastik, Holz, Messing, etc. YG-1 Diamant - beschichtete Hartmetall Schaftfräser zeigen gute Ergebnisse beim Bearbeiten von NE - Metallen und Nichtmetall - Werkstoffen.



CARBIDE | 2 | 30° | R ±0.01 | PLAIN | Diamond

p.C541

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.01)	D_1	D_2	L_1	L_3	L_2	D_3
EIB93004040	R0.2	**0.4**	4	0.6	4	45	0.36
EIB93004060	R0.2	**0.4**	4	0.6	6	45	0.36
EIB93006040	R0.3	**0.6**	4	1	4	45	0.56
EIB93006060	R0.3	**0.6**	4	1	6	45	0.56
EIB93006080	R0.3	**0.6**	4	1	8	45	0.56
EIB93010060	R0.5	**1.0**	4	1.5	6	45	0.95
EIB93010120	R0.5	**1.0**	4	1.5	12	45	0.95
EIB93015120	R0.75	**1.5**	4	1.75	12	45	1.45
EIB93020080	R1.0	**2.0**	4	3	8	60	1.95
EIB93020120	R1.0	**2.0**	4	3	12	60	1.95
EIB93020160	R1.0	**2.0**	4	3	16	60	1.95
EIB93040160	R2.0	**4.0**	4	6	16	60	3.9

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○				◎												

D-POWER GRAPHITE END MILLS

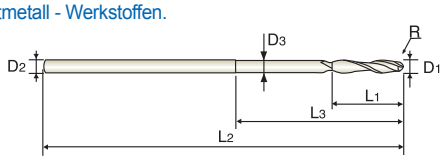
PLAIN SHANK **EI451 SERIES**

CARBIDE, 2 FLUTE BALL NOSE LONG LENGTH with NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS LANG MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE, DÉTALONNÉE, LONGUE
2 TAGLIENTI, SEMISFERICA, SERIE LUNGA

- Higher hardness of film and excellent wear-resistance increase the tool life surprisingly.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc. YG-1's diamond coated carbide ball end mills have good result for the machining of non-ferrous metals and non-metallic materials.

- Höhere Härte der Beschichtung und ausgezeichnete Verschleißfestigkeit verlängern die Standzeit beachtlich.
- Ultrafeiner Film auf YG-1 Diamant - beschichteten Hartmetall Schaftfräser gewährleisten eine glatte und ausgezeichnete Oberflächengüte.
- Hohe Leistungsfähigkeit bei Graphit, Aluminium ohne Silicon, Bakelit, Plastik, Holz, Messing, etc. YG-1 Diamant - beschichtete Hartmetall Schaftfräser zeigen gute Ergebnisse beim Bearbeiten von NE - Metallen und Nichtmetall - Werkstoffen.



CARBIDE | 2 | 30° | R ±0.01 | PLAIN | Diamond

p.C541

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.01)	D_1	D_2	L_1	L_3	L_2	D_3
EI451020	R1.0	**2.0**	4	10	20	80	1.95
EI451030	R1.5	**3.0**	4	15	25	80	2.9
EI451040	R2.0	**4.0**	4	20	30	80	3.9
EI451050	R2.5	**5.0**	6	30	50	100	4.9
EI451060	R3.0	**6.0**	6	30	50	100	5.5
EI451070	R3.5	**7.0**	6	30	-	100	-
EI451080	R4.0	**8.0**	8	40	60	110	7.5
EI451090	R4.5	**9.0**	8	40	-	110	-
EI451100	R5.0	**10.0**	10	50	70	120	9.5
EI451120	R6.0	**12.0**	12	55	75	130	11.5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S					H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○				◎												

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EIB87 SERIES**

CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS MIT KONISCH ABGESETZTEM SCHAFTTEIL
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE AVEC ENTRÉE CONIQUE
2 TAGLIENTI, SEMISFERICA CON SCARICO CONICO

- Higher hardness of film and excellent wear-resistance increase the tool life surprisingly.
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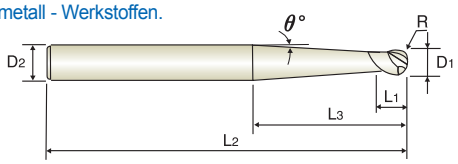
- Höhere Härte der Beschichtung und ausgezeichnete Verschleißfestigkeit verlängern die Standzeit beachtlich.
- Ultrafeiner Film auf YG-1 Diamant - beschichteten Hartmetall Schaftfräser gewährleisten eine glatte und ausgezeichnete Oberflächengüte.
- Hohe Leistungsfähigkeit bei Graphit, Aluminium ohne Silicon, Bakelit, Plastik, Holz, Messing, etc. YG-1 Diamant - beschichtete Hartmetall Schaftfräser zeigen gute Ergebnisse beim Bearbeiten von NE - Metallen und Nichtmetall - Werkstoffen.



CARBIDE | 2 | 30° | R ±0.01 | PLAIN | Diamond

p.C541

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Taper Angle
	R (±0.01)	D_1	D_2	L_1	L_3	L_2	θ°
EIB87010	R0.5	**1.0**	3	2	-	40	8° 30´
EIB87901	R0.5	**1.0**	3	2	30	60	2°
EIB87015	R0.75	**1.5**	3	3	-	40	6° 15´
EIB87020	R1.0	**2.0**	3	4	-	40	4° 15´
EIB87905	R1.0	**2.0**	3	4	30	60	1°
EIB87906	R1.0	**2.0**	4	4	70	100	1°

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○				◎												

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI996 SERIES**

CARBIDE, 2 FLUTE MINIATURE CORNER RADIUS with NECK

VOLLHARTMETALL, 2 SCHNEIDEN MINI ECKENRADIUS MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, TORIQUE, DÉTALONNÉE, MICRO-FRAISE
2 TAGLIENTI, TORICA, SERIE MINI, SCARICATA

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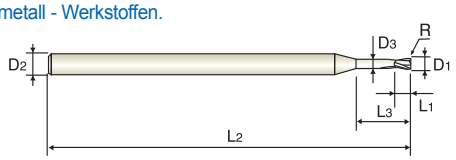
- Höhere Härte der Beschichtung und ausgezeichnete Verschleißfestigkeit verlängern die Standzeit beachtlich.
- Ultrafeiner Film auf YG-1 Diamant - beschichteten Hartmetall Schaftfräser gewährleisten eine glatte und ausgezeichnete Oberflächengüte.
- Hohe Leistungsfähigkeit bei Graphit, Aluminium ohne Silicon, Bakelit, Plastik, Holz, Messing, etc. YG-1 Diamant - beschichtete Hartmetall Schaftfräser zeigen gute Ergebnisse beim Bearbeiten von NE - Metallen und Nichtmetall - Werkstoffen.



CARBIDE | 2 | 30° | PLAIN | Diamond

p.C541

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D_1	D_2	L_1	L_3	L_2	D_3
EI99600200000	-	0.2	3	0.3	-	40	-
EI99600300000	-	0.3	3	0.5	-	40	-
EI99600400000	-	0.4	3	0.6	-	40	-
EI99600505025	R0.05	0.5	3	0.7	2.5	40	0.45
EI99600505040	R0.05	0.5	3	0.7	4	40	0.45
EI996006	R0.05	0.6	3	0.9	3	40	0.55
EI99600605050	R0.05	0.6	3	0.9	5	40	0.55
EI996008	R0.05	0.8	3	1.2	4	40	0.75
EI99600805070	R0.05	0.8	3	1.2	7	40	0.75
EI996010	R0.1	1.0	3	1.5	5	40	0.95
EI996904	R0.1	1.0	3	1.5	8.5	40	0.95
EI99601010120	R0.1	1.0	3	1.5	12	40	0.95
EI996012	R0.1	1.2	3	1.8	6	50	1.15
EI99601210100	R0.1	1.2	3	1.8	10	50	1.15
EI996015	R0.15	1.5	3	2.2	7.5	50	1.4
EI996907	R0.15	1.5	3	2.2	12	50	1.4
EI99601515180	R0.15	1.5	3	2.2	18	50	1.4
EI996020	R0.15	2.0	3	2.2	10	60	1.9
EI996909	R0.15	2.0	3	2.2	16	60	1.9
EI99602015250	R0.15	2.0	3	2.2	25	60	1.9
EI99603020100	R0.2	3.0	4	3	10	65	2.9
EI99603020150	R0.2	3.0	4	3	15	65	2.9
EI99603020200	R0.2	3.0	4	3	20	65	2.9
EI99603020250	R0.2	3.0	4	3	25	75	2.9

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○				◎												

D-POWER GRAPHITE END MILLS

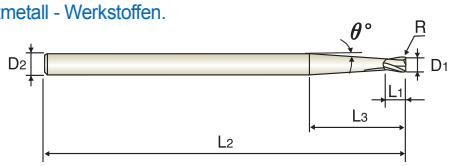
PLAIN SHANK **EIB86 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS with TAPER NECK

VOLLHARTMETALL, 2 SCHEIDEN ECKENRADIUS MIT KONISCH ABGESETZTEM SCHAFTTEIL
FRAISE CARBURE, 2 DENTS, TORIQUE AVEC ENTRÉE CONIQUE
2 TAGLIENTI, TORICA CON SCARICO CONICO

- Higher hardness of film and excellent wear-resistance increase the tool life surprisingly.
- Ultra fine film of YG-1's diamond coated carbide end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc. YG-1's diamond coated carbide end mills have good result for the machining of non-ferrous metals and non-metallic materials.

- Höhere Härte der Beschichtung und ausgezeichnete Verschleißfestigkeit verlängern die Standzeit beachtlich.
- Ultrafeiner Film auf YG-1 Diamant - beschichteten Hartmetall Schaftfräser gewährleisten eine glatte und ausgezeichnete Oberflächengüte.
- Hohe Leistungsfähigkeit bei Graphit, Aluminium ohne Silicon, Bakelit, Plastik, Holz, Messing, etc. YG-1 Diamant - beschichtete Hartmetall Schaftfräser zeigen gute Ergebnisse beim Bearbeiten von NE - Metallen und Nichtmetall - Werkstoffen.



CARBIDE | 2 | 30° | PLAIN | Diamond

p.C541

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Taper Angle
	R	D_1	D_2	L_1	L_3	L_2	$\theta°$
EIB86010	R0.1	**1.0**	3	2	30	60	2°
EIB86902	R0.15	**1.5**	3	3	50	100	1°

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○				◎												

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EIA14 SERIES**

CARBIDE, 3 FLUTE 40° HELIX CORNER RADIUS LONG LENGTH

VOLLHARTMETALL, 3 SCHNEIDN 40° RECHTSSPIRALE ECKENRADIUS LANG
FRAISE CARBURE, 3 DENTS, TORIQUE, HÉLICE 40°, LONGUE
3 TAGLIENTI, ELICA 40°, TORICA, SERIE LUNGA

- Higher hardness of film and excellent wear-resistance increase the tool life surprisingly.
- Ultra fine film of YG-1's diamond coated carbide end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc. YG-1's diamond coated carbide end mills have good result for the machining of non-ferrous metals and non-metallic materials.

- Höhere Härte der Beschichtung und ausgezeichnete Verschleißfestigkeit verlängern die Standzeit beachtlich.
- Ultrafeiner Film auf YG-1 Diamant - beschichteten Hartmetall Schaftfräser gewährleisten eine glatte und ausgezeichnete Oberflächengüte.
- Hohe Leistungsfähigkeit bei Graphit, Aluminium ohne Silicon, Bakelit, Plastik, Holz, Messing, etc. YG-1 Diamant - beschichtete Hartmetall Schaftfräser zeigen gute Ergebnisse beim Bearbeiten von NE - Metallen und Nichtmetall - Werkstoffen.

CARBIDE | 3 | 40° | PLAIN | Diamond

p.C542

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D_1	Shank Diameter D_2	Length of Cut L_1	Overall Length L_2
EIA14020	R0.15	**2.0**	3	9	60
EIA14030	R0.15	**3.0**	3	30	60
EIA14040	R0.2	**4.0**	4	30	60
EIA14050	R0.3	**5.0**	5	35	70
EIA14060	R0.3	**6.0**	6	40	100
EIA14080	R0.5	**8.0**	8	40	100
EIA14100	R0.5	**10.0**	10	40	100

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○				◎												

D-POWER GRAPHITE END MILLS

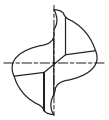
PLAIN SHANK **EIB04 SERIES**

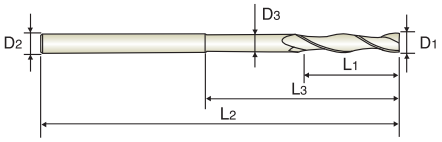
CARBIDE, 2 FLUTE LONG LENGTH with NECK

VOLLHARTMETALL, 2 SCHNEIDEN LANG MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, DÉTALONNÉE, LONGUE
2 TAGLIENTI, SERIE LUNGA

- Higher hardness of film and excellent wear-resistance increase the tool life surprisingly.
- Ultra fine film of YG-1's diamond coated carbide end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass etc. YG-1's diamond coated carbide end mills have good result for the machining of non-ferrous metals and non-metallic materials.

- Höhere Härte der Beschichtung und ausgezeichnete Verschleißfestigkeit verlängern die Standzeit beachtlich.
- Ultrafeiner Film auf YG-1 Diamant - beschichteten Hartmetall Schaftfräser gewährleisten eine glatte und ausgezeichnete Oberflächengüte.
- Hohe Leistungsfähigkeit bei Graphit, Aluminium ohne Silicon, Bakelit, Plastik, Holz, Messing, etc. YG-1 Diamant - beschichtete Hartmetall Schaftfräser zeigen gute Ergebnisse beim Bearbeiten von NE - Metallen und Nichtmetall - Werkstoffen.





CARBIDE | 2 | 30° | PLAIN | Diamond

p.C542

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D_1	D_2	L_1	L_3	L_2	D_3
EIB0400502040	0.5	3	1	2	40	0.45
EIB0400603040	0.6	3	2	3	40	0.55
EIB0400704040	0.7	3	2	4	40	0.65
EIB0400805040	0.8	3	2	5	40	0.75
EIB0401008075	1.0	4	3	8	75	0.95
EIB0401510075	1.5	4	4	10	75	1.45
EIB0402016100	2.0	4	6	16	100	1.9
EIB0402520100	2.5	4	8	20	100	2.4
EIB0403030100	3.0	6	8	30	100	2.8
EIB0403535100	3.5	6	10	35	100	3.2
EIB0404040100	4.0	6	20	40	100	3.7
EIB0405050125	5.0	6	25	50	125	4.6
EIB0406060140	6.0	6	30	60	140	5.6
EIB0408080150	8.0	8	40	80	150	7.4
EIB0410080150	10.0	10	50	80	150	9.4
EIB0411000150	11.0	10	50	-	150	-

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○				◎												

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

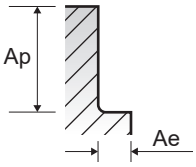
D-POWER GRAPHITE END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

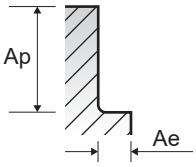
EIA13, EIA14 SERIES — 3 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
N	29.2	Graphite	0.3D	0.3D	Vc	250	375	505	630	755	805	815	790
					fz	0.025	0.035	0.05	0.06	0.07	0.088	0.11	0.13
					RPM	39789	39789	40187	40107	40054	32030	25942	20955
					FEED	2984	4178	6028	7219	8411	8456	8561	8173



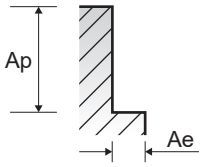
EIB88 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)			
						6.0	8.0	10.0	12.0
N	29.2	Graphite	0.3D	0.3D	Vc	755	805	815	790
					fz	0.035	0.044	0.055	0.065
					RPM	40054	32030	25942	20955
					FEED	5608	5637	5707	5448



EIB04 SERIES — 2 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						0.4	0.6	0.8	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
N	29.2	Graphite	0.1D	1.5D	Vc	50	75	100	125	190	155	190	225	220	205	200	205	205
					fz	0.003	0.004	0.007	0.009	0.010	0.016	0.020	0.026	0.043	0.064	0.081	0.092	0.109
					RPM	39789	39789	39789	39789	40319	24669	20160	17905	14006	10876	7958	6525	5438
					FEED	239	318	557	716	806	789	806	931	1204	1392	1289	1201	1185



Leading Through Innovation

SOLID CARBIDE

CRX S END MILLS

CRX S FRÄSER

- DLC Coated Carbide End Mills for Copper
- DLC beschichtete VHM Fräser für die Kupfer

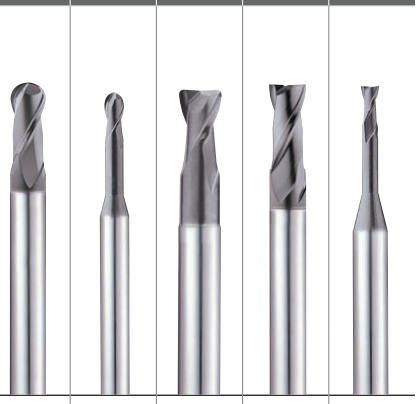
SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
CRX S
END MILLS

DLC Coated Carbide End Mills for Copper

SERIES	SGED28	SGED27	SGED29	SGED31	SGED30
FLUTE	2	2	2	2	2
HELIX ANGLE	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE	SQUARE
SIZE MIN	R0.5	R0.25	D1.0	D1.0	D0.5
SIZE MAX	R6.0	R6.0	D12.0	D12.0	D12.0
PAGE	C545	C546	C548	C550	C551
	-	EXTENDED NECK	EXTENDED NECK	-	EXTENDED NECK
	DLC	DLC	DLC	DLC	DLC



Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C553

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	SGED28	SGED27	SGED29	SGED31	SGED30
P	1	Non-alloy steel	About 0.15% C	Annealed	125						
	2		About 0.45% C	Annealed	190	13					
	3		About 0.45% C	Quenched & Tempered	250	25					
	4		About 0.75% C	Annealed	270	28					
	5		About 0.75% C	Quenched & Tempered	300	32					
	6	Low alloy steel		Annealed	180	10					
	7			Quenched & Tempered	275	29					
	8			Quenched & Tempered	300	32					
	9			Quenched & Tempered	350	38					
	10	High alloyed steel, and tool steel		Annealed	200	15					
	11			Quenched & Tempered	325	35					
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15					
	13		Martensitic	Quenched & Tempered	240	23					
	14		Austenitic		180	10					
K	15	Grey cast iron	Pearlitic / ferritic		180	10					
	16		Pearlitic (Martensitic)		260	26					
	17	Nodular cast iron	Ferritic		160	3					
	18		Pearlitic		250	25					
	19	Malleable cast iron	Ferritic		130						
	20		Pearlitic		230	21					
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○	○	○
	22		Curable	Hardened	100		○	○	○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75						
	24		≤ 12% Si, Curable	Hardened	90						
	25		> 12% Si, Not Curable		130						
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	◎	◎	◎	◎
	27		CuZn, CuSnZn (Brass)		90		◎	◎	◎	◎	◎
	28		CuSn, lead-free copper and electrolytic copper		100		◎	◎	◎	◎	◎
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○	○	○	○	○
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm						
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55					
	39			Hardened	630	60					
	40	Chilled Cast Iron		Cast	400	42					
	41	Hardened Cast Iron		Hardened	550	55					

CRX S END MILLS

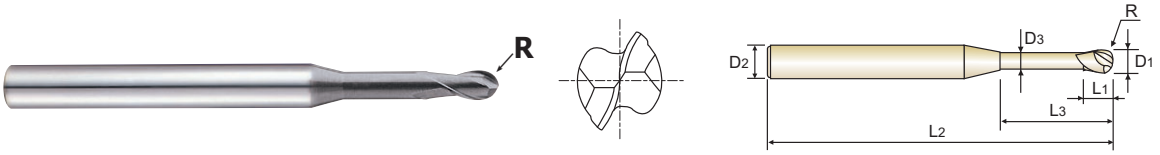
PLAIN SHANK **SGED27 SERIES**

CARBIDE, 2 FLUTE BALL NOSE DLC COATING with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS DLC BESCHICHTUNG MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE, DÉTALONNÉE, REVÊTUE DLC
2 TAGLIENTI, SEMISFERICA CON SCARICO ESTESO, RIV. DLC

- Designed for copper, copper alloys soft graphite, reinforced plastics and the materials affiliated with non-ferrous metals.
- Tight radius tolerance is applied (±0.005mm tolerance under R3).
- Excellent surface roughness thanks to Mirror Face of cutting edges
- High strength and minimized vibration are available due to two step taper neck(under R0.5).

- Entwickelt für die Bearbeitung von Kupfer, Kupferlegierungen, sowie faserverstärkten Kunststoffen, NE- Metallen
- Hochgenaue Raduistoleranz (±0.005mm Toleranz unter R3mm)
- Sehr gute Oberflächenrauhigkeit wird durch die besonders behandelte Schneide erreicht
- Hohe Zähigkeit und verminderte Vibrationen werden durch den besonderen kegelförmigen Hals erreicht, (unter R 0,5mm)



CARBIDE | 2 | 30° | R ±0.005 (R0.25~R3) | R ±0.010 (R4~R6) | PLAIN | DLC p.C554

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D_1	Shank Diameter D_2	Length of Cut L_1	Length Below Shank L_3	Overall Length L_2	Neck Diameter D_3
SGED2700502	R0.25	**0.5**	4	0.5	2	45	0.45
SGED2700504	R0.25	**0.5**	4	0.5	4	45	0.45
SGED2700506	R0.25	**0.5**	4	0.5	6	45	0.45
SGED2700510	R0.25	**0.5**	4	0.5	10	45	0.45
SGED2700602	R0.3	**0.6**	4	0.6	2	45	0.55
SGED2700604	R0.3	**0.6**	4	0.6	4	45	0.55
SGED2700606	R0.3	**0.6**	4	0.6	6	45	0.55
SGED2700608	R0.3	**0.6**	4	0.6	8	45	0.55
SGED2700804	R0.4	**0.8**	4	0.8	4	45	0.75
SGED2700806	R0.4	**0.8**	4	0.8	6	45	0.75
SGED2700808	R0.4	**0.8**	4	0.8	8	45	0.75
SGED2700810	R0.4	**0.8**	4	0.8	10	45	0.75
SGED2701004	R0.5	**1.0**	4	1	4	45	0.95
SGED2701006	R0.5	**1.0**	4	1	6	45	0.95
SGED2701010	R0.5	**1.0**	4	1	10	45	0.95
SGED2701012	R0.5	**1.0**	4	1	12	45	0.95
SGED2701506	R0.75	**1.5**	4	1.5	6	45	1.45
SGED2701508	R0.75	**1.5**	4	1.5	8	45	1.45
SGED2701512	R0.75	**1.5**	4	1.5	12	45	1.45

▶ NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0 ~ - 0.012	h5
over R3	±0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○				◎	◎	◎	○												

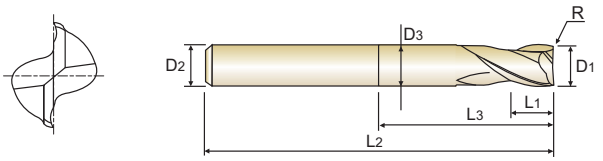
CRX S END MILLS

PLAIN SHANK **SGED29 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS DLC COATING with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN ECKENRADIUS DLC BESCHICHTUNG MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, TORIQUE, DÉTALONNÉE, REVÊTUE DLC
2 TAGLIENTI, TORICA CON SCARICO ESTESO, RIVESTIMENTO DLC

- ▶ Designed for copper, copper alloys, soft graphite, reinforced plastics and materials affiliated with non-ferrous metals.
- ▶ Excellent surface roughness from Mirror Face of cutting edges
- ▶ Entwickelt für die Bearbeitung von Kupfer, Kupferlegierungen, sowie faserverstärkten Kunststoffen, NE- Metallen
- ▶ Ausgelegt für verschiedene Anwendungen, z.B. schruppen, schruppschlichten und zur schlicht Bearbeitung, aufgrund der neuartigen Geometrie



CARBIDE | 2 | 30° | R ±0.010 Ø1~Ø6 | R ±0.015 Ø8~Ø12 | PLAIN | DLC p.C553

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SGED290100104	R0.1	1.0	4	1.5	4	45	0.95
SGED290100106	R0.1	1.0	4	1.5	6	45	0.95
SGED290100108	R0.1	1.0	4	1.5	8	45	0.95
SGED290100206	R0.2	1.0	4	1.5	6	45	0.95
SGED290150106	R0.1	1.5	4	2.3	6	45	1.45
SGED290150108	R0.1	1.5	4	2.3	8	45	1.45
SGED290150110	R0.1	1.5	4	2.3	10	45	1.45
SGED290150210	R0.2	1.5	4	2.3	10	45	1.45
SGED290200208	R0.2	2.0	4	3	8	45	1.95
SGED290200210	R0.2	2.0	4	3	10	45	1.95
SGED290200212	R0.2	2.0	4	3	12	45	1.95
SGED290200508	R0.5	2.0	4	3	8	45	1.95
SGED290200510	R0.5	2.0	4	3	10	45	1.95
SGED290200512	R0.5	2.0	4	3	12	45	1.95
SGED290300210	R0.2	3.0	6	4.5	10	50	2.85
SGED290300212	R0.2	3.0	6	4.5	12	50	2.85
SGED290300216	R0.2	3.0	6	4.5	16	60	2.85
SGED290300310	R0.3	3.0	6	4.5	10	50	2.85
SGED290300312	R0.3	3.0	6	4.5	12	50	2.85
SGED290300316	R0.3	3.0	6	4.5	16	60	2.85

▶ NEXT PAGE

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	± 0.010	0 ~ - 0.012	h5
over Ø6	± 0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○				◎	◎	◎	○												

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

CRX S END MILLS

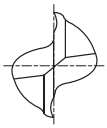
PLAIN SHANK **SGED31** SERIES

CARBIDE, 2 FLUTE DLC COATING

VOLLHARTMETALL, 2 SCHNEIDEN DLC BESCHICHTUNG
FRAISE CARBURE, 2 DENTS, REVÊTUE DLC
2 TAGLIENTI, RIVESTIMENTO DLC

- Designed for copper, copper alloys, soft graphite, reinforced plastics and materials affiliated with non-ferrous metals.
- Excellent surface roughness from special flute geometry for removing burrs

- Entwickelt für die Bearbeitung von Kupfer, Kupferlegierungen, sowie faserverstärkten Kunststoffen, NE- Metallen
- Hervorragende Oberflächenrauheit durch speziell behandelte Nutengeometrie was zur verminderten Gratbildung führt



CARBIDE | 2 | 30° | PLAIN | DLC | p.C554

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
SGED31010	1.0	6	2.5	50
SGED31015	1.5	6	4	50
SGED31020	2.0	6	6	50
SGED31025	2.5	6	8	50
SGED31030	3.0	6	10	50
SGED31040	4.0	6	12	50
SGED31050	5.0	6	15	60
SGED31060	6.0	6	15	60
SGED31080	8.0	8	20	65
SGED31100	10.0	10	25	70
SGED31120	12.0	12	30	80

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0 ~ - 0.012	h5
over Ø6	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○				◎	◎	◎	○												

CRX S END MILLS

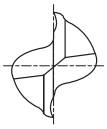
PLAIN SHANK **SGED30 SERIES**

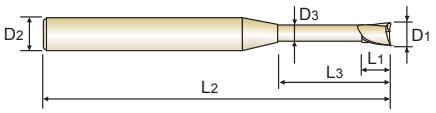
CARBIDE, 2 FLUTE DLC COATING with EXTENDED NECK

VOLLHARTMETALL, 2 SCHNEIDEN DLC BESCHICHTUNG MIT ABGESETZTEM SCHAFTTETL
FRAISE CARBURE, 2 DENTS, DÉTALONNÉE, REVÊTUE DLC
2 TAGLIENTI, SCARICO ESTESO, RIVESTIMENTO DLC

- Designed for copper, copper alloys, soft graphite, reinforced plastics and materials affiliated with non-ferrous metals.
- High toughness and minimized vibration applied from two step taper neck (under dia. 1.0mm)
- Excellent surface roughness from special flute geometry for removing burrs

- Entwickelt für die Bearbeitung von Kupfer, Kupferlegierungen, sowie faserverstärkten Kunststoffen, NE- Metallen
- Hohe Zähigkeit und verminderte Vibrationen werden durch den besonderen kegelförmigen Hals erreicht, (unter Ø 1mm)
- Hervorragende Oberflächenrauheit durch speziell behandelte Nutengeometrie





CARBIDE | 2 | 30° | PLAIN | DLC

p.C554

Unit : mm

EDP No.	Mill Diameter D_1	Shank Diameter D_2	Length of Cut L_1	Length Below Shank L_3	Overall Length L_2	Neck Diameter D_3
SGED3001516	1.5	4	2.3	16	50	1.45
SGED3002008	2.0	4	3	8	45	1.95
SGED3002010	2.0	4	3	10	45	1.95
SGED3002012	2.0	4	3	12	45	1.95
SGED3002016	2.0	4	3	16	50	1.95
SGED3003008	3.0	6	4.5	8	50	2.85
SGED3003010	3.0	6	4.5	10	50	2.85
SGED3003016	3.0	6	4.5	16	60	2.85
SGED3003020	3.0	6	4.5	20	60	2.85
SGED3004010	4.0	6	6	10	50	3.85
SGED3004012	4.0	6	6	12	50	3.85
SGED3004016	4.0	6	6	16	60	3.85
SGED3004020	4.0	6	6	20	60	3.85
SGED3004025	4.0	6	6	25	60	3.85
SGED3006020	6.0	6	8	20	60	5.85
SGED3006030	6.0	6	8	30	90	5.85
SGED3008020	8.0	8	12	20	70	7.70
SGED3010025	10.0	10	15	25	80	9.70
SGED3012025	12.0	12	18	25	80	11.70

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0 ~ - 0.012	h5
over Ø6	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend																				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○				◎	◎	◎	○												

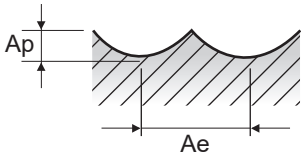
CRX S END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

SGED27 SERIES — 2 FLUTE BALL

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.5	0.6	0.8	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
N	21	Aluminum-wrought alloy	0.05D	0.02D	Vc	80	95	125	155	250	245	240	240	245	250	250	250
					fz	0.005	0.007	0.009	0.01	0.022	0.03	0.042	0.052	0.061	0.079	0.1	0.122
					RPM	50930	50399	49736	49338	39789	25995	19099	15279	12998	9947	7958	6631
					FEED	509	706	895	987	1751	1560	1604	1589	1586	1572	1592	1618
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.05D	0.02D	Vc	80	95	110	110	125	125	120	120	125	125	125	125
					fz	0.005	0.007	0.009	0.011	0.02	0.028	0.038	0.047	0.055	0.072	0.091	0.111
					RPM	50930	50399	43768	35014	19894	13263	9549	7639	6631	4974	3979	3316
					FEED	509	706	788	770	796	743	726	718	729	716	724	736
	29.1	Duroplastic	0.05D	0.02D	Vc	80	95	125	155	315	370	360	365	370	375	375	375
					fz	0.004	0.005	0.006	0.006	0.013	0.019	0.027	0.033	0.039	0.05	0.064	0.077
					RPM	50930	50399	49736	49338	50134	39258	28648	23237	19629	14921	11937	9947
					FEED	407	504	597	592	1303	1492	1547	1534	1531	1492	1528	1532



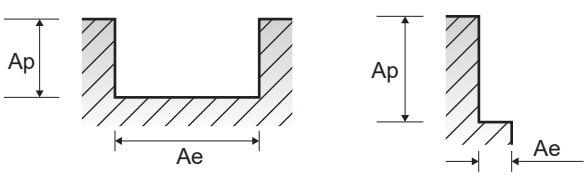
SGED30, SGED31 SERIES

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.5	0.6	0.8	1.0	2.0	3.0	4.0	6.0	8.0	10.0	12.0
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	Vc	80	95	125	155	315	330	325	325	330	325	330
					fz	0.005	0.006	0.008	0.01	0.01	0.023	0.032	0.048	0.064	0.081	0.097
					RPM	50930	50399	49736	49338	50134	35014	25863	17242	13130	10345	8754
					FEED	509	605	796	987	1003	1611	1655	1655	1681	1676	1698
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	0.5D	Vc	80	95	105	110	160	165	160	165	165	160	165
					fz	0.005	0.006	0.008	0.01	0.01	0.023	0.032	0.048	0.064	0.081	0.097
					RPM	50930	50399	41778	35014	25465	17507	12732	8754	6565	5093	4377
					FEED	509	605	668	700	509	805	815	840	840	825	849
	29.1	Duroplastic	1.0D	0.5D	Vc	80	95	125	155	315	470	490	490	500	490	495
					fz	0.001	0.002	0.002	0.003	0.004	0.007	0.009	0.014	0.018	0.023	0.028
					RPM	50930	50399	49736	49338	50134	49869	38993	25995	19894	15597	13130
					FEED	102	202	199	296	401	698	702	728	716	717	735

2 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.5	0.6	0.8	1.0	2.0	3.0	4.0	6.0	8.0	10.0	12.0
N	21-22	Aluminum-wrought alloy	0.5D	1.0D	Vc	80	95	125	130	260	260	265	270	265	265	270
					fz	0.005	0.006	0.008	0.01	0.011	0.025	0.034	0.053	0.069	0.086	0.107
					RPM	50930	50399	49736	41380	41380	27587	21088	14324	10544	8435	7162
					FEED	509	605	796	828	910	1379	1434	1518	1455	1451	1533
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	1.0D	Vc	80	85	85	85	170	175	175	180	175	175	180
					fz	0.005	0.006	0.008	0.01	0.01	0.023	0.032	0.05	0.064	0.08	0.1
					RPM	50930	45094	33820	27056	27056	18568	13926	9549	6963	5570	4775
					FEED	509	541	541	541	541	854	891	955	891	891	955
	29.1	Duroplastic	0.5D	1.0D	Vc	80	95	125	155	315	350	350	360	350	350	360
					fz	0.004	0.005	0.006	0.008	0.009	0.018	0.026	0.04	0.051	0.064	0.08
					RPM	50930	50399	49736	49338	50134	37136	27852	19099	13926	11141	9549
					FEED	407	504	597	789	902	1337	1448	1528	1420	1426	1528



Leading Through Innovation

SOLID CARBIDE

K-2 END MILLS

K-2 VHM - Fräser

- General Purpose / Conventional or High Speed Milling / Wet & Dry Cutting
- Für allgemeinen Einsatz / Konventionelles oder Hochgeschwindigkeitsfräsen

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
K-2
END MILLS

General Purpose
Conventional or High Speed Milling
Wet & Dry Cutting

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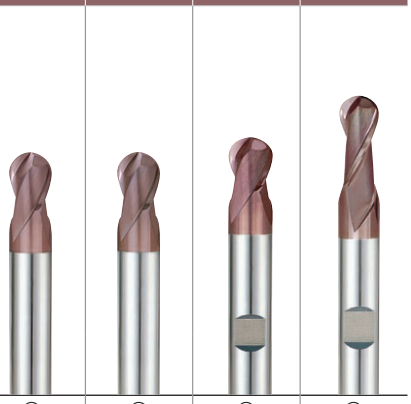
◎ : Excellent ○ : Good

Recommended cutting conditions : C613

SERIES	G9624	G9A70	G9437	G9438
FLUTE	2	2	2	2
HELIX ANGLE	30°	30°	≈ 30°	≈ 30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R1.0	R0.5	R1.0	R1.0
SIZE MAX	R10.0	R10.0	R10.0	R10.0
PAGE	C562	C563	C564	C565
	SHORT LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH
	TiAlN	TiAlN	TiAlN	TiAlN



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○	○	○
	14		Austenitic		180	10	○	○	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○	○
	18		Pearlitic		250	25	○	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○	○
	20		Pearlitic		230	21	○	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○	○
	22		Curable	Hardened	100		○	○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○	○	○
	25		> 12% Si, Not Curable		130		○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○
	32			Cured	280	30	○	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○	○
	34			Cured	350	38	○	○	○	○
	35			Cast	320	34	○	○	○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	○	○
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○
	41	Hardened Cast Iron		Hardened	550	55				

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
K-2
END MILLS

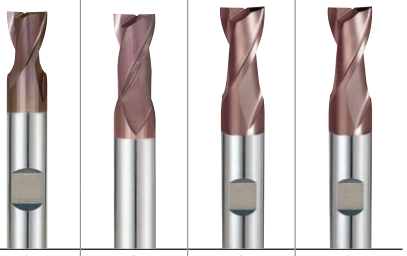
General Purpose with Coating
Conventional or High Speed Milling, Wet or Dry Cutting

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : C613

SERIES	G9444	G9527	G9445	G9G45
FLUTE	2	2	2	2
HELIX ANGLE	≈ 30°	≈ 30°	≈ 30°	≈ 30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D2.0	D3.5	D2.0	D3.0
SIZE MAX	D20.0	D20.0	D20.0	D20.0
PAGE	C580	C581	C582	C584
	SHORT LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH with CHAMFER
	TiAlN	TiAlN	TiAlN	TiAlN



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○	○	○
	14		Austenitic		180	10	○	○	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○	○
	18		Pearlitic		250	25	○	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○	○
	20		Pearlitic		230	21	○	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○	○
	22		Curable	Hardened	100		○	○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○	○	○
	25		> 12% Si, Not Curable		130		○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○	○	○	○
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○
	32			Cured	280	30	○	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○	○
	34			Cured	350	38	○	○	○	○
	35			Cast	320	34	○	○	○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	○	○
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○
	41	Hardened Cast Iron		Hardened	550	55				

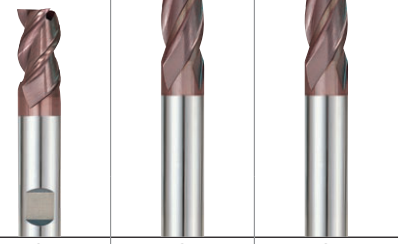
SELECTION GUIDE

YG MILLING TOOLS

SERIES	G9G49	G9432	G9G50
FLUTE	3	4	4
HELIX ANGLE	45°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE
SIZE MIN	D3.0	D1.0	D3.0
SIZE MAX	D20.0	D20.0	D20.0
PAGE	C599	C600	C601
	LONG LENGTH with CHAMFER	SHORT LENGTH	SHORT LENGTH with CHAMFER
	TiAlN	TiAlN	TiAlN

SOLID CARBIDE
K-2
END MILLS

General Purpose with Coating
Conventional or High Speed Milling, Wet or Dry Cutting



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◎ : Excellent ○ : Good

Recommended cutting conditions : C613

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○	○	○
	13		Martensitic	Quenched & Tempered	240	23	○	○	○
	14		Austenitic		180	10	○	○	○
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○
	18		Pearlitic		250	25	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○
	20		Pearlitic		230	21	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○
	22		Curable	Hardened	100		○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○	○
	25		> 12% Si, Not Curable		130		○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○	○	○
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○
	32			Cured	280	30	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○
	34			Cured	350	38	○	○	○
	35			Cast	320	34	○	○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	○
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42	○	○	○
	41	Hardened Cast Iron		Hardened	550	55			

K-2 END MILLS

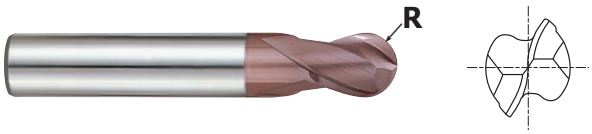
PLAIN SHANK **G9624 SERIES**

CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

VOLLHARTMETALL, 2 SCHNEIDEN KURZ STIRNRADIUS
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE, COURTE
2 TAGLIENTI, SEMISFERICA, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



p.C613

Unit : mm

EDP No.	Radius of Ball Nose R (±0.02)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9624020	R1.0	2.0	6	4	48
G9624025	R1.25	2.5	6	4	48
G9624030	R1.5	3.0	6	4	48
G9624040	R2.0	4.0	6	6	50
G9624901	R2.0	4.0	4	12	40
G9624050	R2.5	5.0	6	7	51
G9624060	R3.0	6.0	6	7	51
G9624080	R4.0	8.0	8	9	59
G9624100	R5.0	10.0	10	10	60
G9624120	R6.0	12.0	12	14	71
G9624140	R7.0	14.0	14	14	71
G9624160	R8.0	16.0	16	16	76
G9624180	R9.0	18.0	18	18	76
G9624200	R10.0	20.0	20	20	82

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

FLAT SHANK **G9437** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

VOLLHARTMETALL, 2 SCHNEIDEN KURZ STIRNRADIUS
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE, COURTE
2 TAGLIENTI, SEMISFERICA, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.

CARBIDE | DIN 6527 | 2 | 30° | R ±0.02 | DIN 6535HB | TiAlN p.C613

Unit : mm

EDP No.	Radius of Ball Nose R (±0.02)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9437020	R1.0	2.0	6	3	50
G9437030	R1.5	3.0	6	4	50
G9437040	R2.0	4.0	6	5	54
G9437050	R2.5	5.0	6	6	54
G9437060	R3.0	6.0	6	7	54
G9437080	R4.0	8.0	8	9	58
G9437100	R5.0	10.0	10	11	66
G9437180	R9.0	18.0	18	18	84
G9437200	R10.0	20.0	20	20	92

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

PLAIN SHANK **G9454 SERIES**

CARBIDE, 2 FLUTE LONG REACH BALL NOSE

VOLLHARTMETALL, 2 SCHNEIDEN GROSSE REICHWEITE STIRNRADIUS
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE LONGUE PORTÉE
2 TAGLIENTI, SEMISFERICA, GAMBO LUNGO

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.

CARBIDE | 2 | 30° | R ±0.02 | DIN 6535HA | TiAlN p.C613

Unit : mm

EDP No.	Radius of Ball Nose R (±0.02)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9454030	R1.5	3.0	3	5	75
G9454040	R2.0	4.0	4	8	75
G9454050	R2.5	5.0	5	9	75
G9454060	R3.0	6.0	6	10	100
G9454080	R4.0	8.0	8	12	100
G9454100	R5.0	10.0	10	14	100
G9454120	R6.0	12.0	12	16	100
G9454140	R7.0	14.0	14	18	100
G9454160	R8.0	16.0	16	22	150
G9454200	R10.0	20.0	20	26	150

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

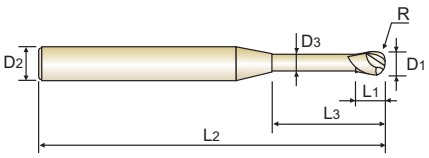
PLAIN SHANK **G9B81 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN STIRNRADIUS FÜR SCHMALE RIPPEN
FRAISE CARBURE, 2 DENTS, HÉMISPHÉRIQUE POUR USINAGE DE RAINURE
2 TAGLIENTI, SEMISFERICA, SCARICATA PER NERVATURE

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.



CARBIDE | 2 | 30° | R ±0.02 | DIN 6535HA | TiAlN

p.C614~C615

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.02)	D1	D2	L1	L3	D3	D3
G9B81004	R0.2	0.4	4	0.7	2	50	0.37
G9B81005	R0.25	0.5	4	0.75	2	50	0.45
G9B81901	R0.25	0.5	4	0.75	4	50	0.45
G9B81902	R0.25	0.5	4	0.75	6	50	0.45
G9B81006	R0.3	0.6	4	0.9	2	50	0.55
G9B81903	R0.3	0.6	4	0.9	4	50	0.55
G9B81904	R0.3	0.6	4	0.9	6	50	0.55
G9B81008	R0.4	0.8	4	1.2	4	50	0.75
G9B81905	R0.4	0.8	4	1.2	6	50	0.75
G9B81906	R0.4	0.8	4	1.2	8	50	0.75
G9B81010	R0.5	1.0	4	1.5	6	50	0.95
G9B81907	R0.5	1.0	4	1.5	8	50	0.95
G9B81908	R0.5	1.0	4	1.5	10	50	0.95
G9B81909	R0.5	1.0	4	1.5	12	50	0.95
G9B81012	R0.6	1.2	4	1.8	8	50	1.15
G9B81910	R0.6	1.2	4	1.8	12	50	1.15
G9B81014	R0.7	1.4	4	2.1	16	50	1.35
G9B81015	R0.75	1.5	4	2.3	6	50	1.45
G9B81911	R0.75	1.5	4	2.3	8	50	1.45
G9B81912	R0.75	1.5	4	2.3	10	50	1.45
G9B81913	R0.75	1.5	4	2.3	12	50	1.45
G9B81914	R0.75	1.5	4	2.3	16	50	1.45
G9B81915	R0.75	1.5	4	2.3	20	50	1.45
G9B81016	R0.8	1.6	4	2.4	8	50	1.55

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													

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YG-1 CO., LTD.

K-2 END MILLS

PLAIN SHANK **G9634 SERIES**

CARBIDE, 4 FLUTE SHORT LENGTH BALL NOSE

VOLLHARTMETALL, 4 SCHNEIDEN KURZ STIRNRADIUS
FRAISE CARBURE, 4 DENTS, HÉMISPHÉRIQUE, COURTE
4 TAGLIENTI, SEMISFERICA, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.

p.C616

Unit : mm

EDP No.	Radius of Ball Nose R (±0.02)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9634020	R1.0	2.0	6	4	48
G9634030	R1.5	3.0	6	4	48
G9634040	R2.0	4.0	6	6	50
G9634050	R2.5	5.0	6	7	51
G9634060	R3.0	6.0	6	7	51
G9634080	R4.0	8.0	8	9	59
G9634100	R5.0	10.0	10	10	60
G9634120	R6.0	12.0	12	14	71
G9634140	R7.0	14.0	14	14	71
G9634160	R8.0	16.0	16	16	76
G9634180	R9.0	18.0	18	18	76
G9634200	R10.0	20.0	20	20	82

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○			○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

PLAIN SHANK **G9B82 SERIES**

CARBIDE, 2 FLUTE SHORT LENGTH CORNER RADIUS

VOLLHARTMETALL, 2 SCHNEIDEN KURZ ECKENRADIUS
FRAISE CARBURE, 2 DENTS, TORIQUE, COURTE
2 TAGLIENTI, SERIE CORTA, TORICA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.

p.C617

Unit : mm

EDP No.	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9B82080	R0.5	8.0	8	16	60
G9B82917	R1.0	8.0	8	16	60
G9B82918	R1.5	8.0	8	16	60
G9B82919	R2.0	8.0	8	16	60
G9B82920	R2.5	8.0	8	16	60
G9B82100	R0.5	10.0	10	20	75
G9B82921	R1.0	10.0	10	20	75
G9B82922	R1.5	10.0	10	20	75
G9B82923	R2.0	10.0	10	20	75
G9B82924	R2.5	10.0	10	20	75
G9B82925	R1.0	12.0	12	24	75
G9B82927	R2.0	12.0	12	24	75
G9B82928	R2.5	12.0	12	24	75

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○											○	

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YG-1 CO., LTD.

K-2 END MILLS

PLAIN SHANK **G9B84 SERIES**

CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

VOLLHARTMETALL, 4 SCHNEIDEN KURZ ECKENRADIUS
FRAISE CARBURE, 4 DENTS, TORIQUE, COURTE
4 TAGLIENTI, SERIE CORTA, TORICA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.

CARBIDE | 4 | 30° | DIN 6535HA | TiAlN p.C618

Unit : mm

EDP No.	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9B84020	R0.2	2.0	4	4	50
G9B84901	R0.3	2.0	4	4	50
G9B84902	R0.5	2.0	4	4	50
G9B84904	R0.5	2.5	4	5	50
G9B84030	R0.2	3.0	4	6	50
G9B84906	R0.5	3.0	4	6	50
G9B84907	R1.0	3.0	4	6	50
G9B84040	R0.2	4.0	4	8	50
G9B84908	R0.3	4.0	4	8	50
G9B84910	R1.0	4.0	4	8	50
G9B84050	R0.2	5.0	6	10	50
G9B84911	R0.3	5.0	6	10	50
G9B84912	R0.5	5.0	6	10	50
G9B84913	R1.0	5.0	6	10	50
G9B84060	R0.2	6.0	6	12	50
G9B84914	R0.3	6.0	6	12	50
G9B84915	R0.5	6.0	6	12	50
G9B84916	R1.0	6.0	6	12	50
G9B84080	R0.5	8.0	8	16	60
G9B84917	R1.0	8.0	8	16	60

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○											○	

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YG-1 CO., LTD.

K-2 END MILLS

PLAIN SHANK **G9B85 SERIES**

CARBIDE, 4 FLUTE LONG REACH CORNER RADIUS

VOLLHARTMETALL, 4 SCHNEIDEN GROSSE REICHWEITE ECKENRADIUS
FRAISE CARBURE, 4 DENTS, TORIQUE LONGUE PORTÉE
4 TAGLIENTI, SERIE LUNGA, TORICA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- Designed for milling of radius bottom slots, fillets and special contours.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- Bestimmt für das Fräsen von Nuten mit konvexem Grund, Sonderprofilen und zum Kopieren.

p.C618

Unit : mm

EDP No.	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9B85030	R0.5	3.0	4	6	75
G9B85901	R1.0	3.0	4	6	75
G9B85040	R0.5	4.0	4	8	75
G9B85902	R1.0	4.0	4	8	75
G9B85050	R0.5	5.0	6	10	75
G9B85903	R1.0	5.0	6	10	75
G9B85060	R0.5	6.0	6	12	75
G9B85904	R1.0	6.0	6	12	75
G9B85080	R0.5	8.0	8	16	100
G9B85905	R1.0	8.0	8	16	100
G9B85906	R1.5	8.0	8	16	100
G9B85907	R2.0	8.0	8	16	100
G9B85908	R2.5	8.0	8	16	100
G9B85100	R0.5	10.0	10	20	100
G9B85909	R1.0	10.0	10	20	100
G9B85911	R2.0	10.0	10	20	100
G9B85120	R0.5	12.0	12	24	100
G9B85913	R1.0	12.0	12	24	100
G9B85914	R1.5	12.0	12	24	100
G9B85915	R2.0	12.0	12	24	100
G9B85916	R2.5	12.0	12	24	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○											○	

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K-2 END MILLS

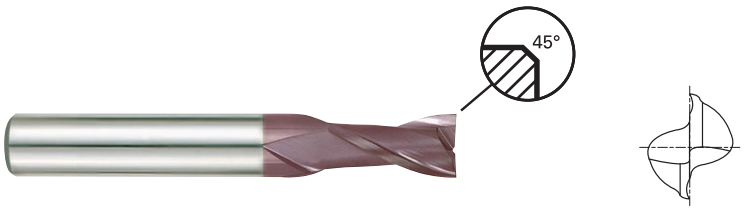
PLAIN SHANK **G9G44** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH WITH CHAMFER

VOLLHARTMETALL, 2 SCHNEIDEN KURZ
FRAISE CARBURE, 2 DENTS, COURTE
2 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.

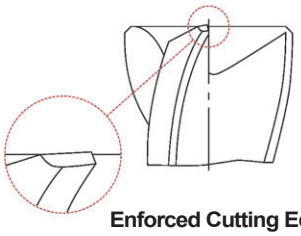


p.C619

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G44030	3.0	3	12	32	0.10
G9G44040	4.0	4	12	40	0.10
G9G44050	5.0	5	14	50	0.10
G9G44060	6.0	6	16	50	0.10
G9G44080	8.0	8	20	60	0.13
G9G44100	10.0	10	22	70	0.13
G9G44120	12.0	12	22	70	0.18
G9G44140	14.0	14	25	75	0.18
G9G44160	16.0	16	25	75	0.18

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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K-2 END MILLS

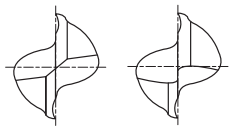
FLAT SHANK **G9444** SERIES

CARBIDE, 2 FLUTE SHORT LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN KURZ
FRAISE CARBURE, 2 DENTS, COURTE
2 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



under Ø3mm from Ø3mm

CARBIDE | DIN 6527 | 2 | ≈30° | DIN 6535HB | TiAlN

p.C619

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9444020	2.0	6	3	50
G9444030	3.0	6	4	50
G9444035	3.5	6	4	50
G9444040	4.0	6	5	54
G9444045	4.5	6	5	54
G9444050	5.0	6	6	54
G9444060	6.0	6	7	54
G9444070	7.0	8	8	58
G9444080	8.0	8	9	58
G9444090	9.0	10	10	66
G9444100	10.0	10	11	66
G9444120	12.0	12	12	73
G9444140	14.0	14	14	75
G9444160	16.0	16	16	82
G9444180	18.0	18	18	84
G9444200	20.0	20	20	92

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

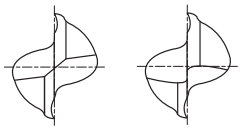
FLAT SHANK **G9445** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

VOLLHARTMETALL, 2 SCHNEIDEN LANG
FRAISE CARBURE, 2 DENTS, LONGUE
2 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



CARBIDE | DIN 6527 | 2 | 30° | DIN 6535HA | DIN 6535HB | TiAlN p.C619

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9445901	2.0	● 3	6	38
G9445028	2.8	6	7	57
G9445030	3.0	6	7	57
G9445035	3.5	6	7	57
G9445038	3.8	6	8	57
G9445040	4.0	6	8	57
G9445045	4.5	6	8	57
G9445048	4.8	6	10	57
G9445050	5.0	6	10	57
G9445957	5.75	6	10	57
G9445060	6.0	6	10	57
G9445967	6.75	8	13	63
G9445070	7.0	8	13	63
G9445977	7.75	8	16	63
G9445080	8.0	8	16	63
G9445087	8.7	10	16	72
G9445090	9.0	10	16	72
G9445097	9.7	10	19	72
G9445100	10.0	10	19	72
G9445117	11.7	12	22	83
G9445120	12.0	12	22	83
G9445140	14.0	14	22	83

● with plain shank

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

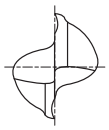
FLAT SHANK **G9G45** SERIES

CARBIDE, 2 FLUTE LONG LENGTH WITH CHAMFER

VOLLHARTMETALL, 2 SCHNEIDEN LANG
FRAISE CARBURE, 2 DENTS, LONGUE
2 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.



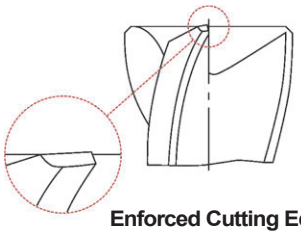
CARBIDE | DIN 6527 | 2 | 30° | DIN 6535HB | C x 45° | TiAlN

p.C619

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G45030	3.0	6	7	57	0.10
G9G45040	4.0	6	8	57	0.10
G9G45050	5.0	6	10	57	0.10
G9G45060	6.0	6	10	57	0.10
G9G45080	8.0	8	16	63	0.13
G9G45100	10.0	10	19	72	0.13
G9G45120	12.0	12	22	83	0.18
G9G45200	20.0	20	32	104	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

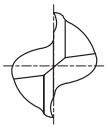
PLAIN SHANK **G9B80 SERIES**

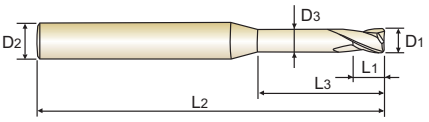
CARBIDE, 2 FLUTE RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN SCHMALE RIPPEN
FRAISE CARBURE, 2 DENTS POUR USINAGE DE RAINURE
2 TAGLIENTI, SCARICATA PER NERVATURE

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 2 flute design for slotting.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 2 Schneiden zum Nutenfräsen.





CARBIDE | 2 | 30° | DIN 6535HA | TiAlN

p.C620~C621

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	D3	D3
G9B80004	0.4	4	0.7	2	50	0.37
G9B80901	0.4	4	0.7	4	50	0.37
G9B80005	0.5	4	0.75	2	50	0.45
G9B80902	0.5	4	0.75	4	50	0.45
G9B80903	0.5	4	0.75	6	50	0.45
G9B80006	0.6	4	0.9	2	50	0.55
G9B80904	0.6	4	0.9	4	50	0.55
G9B80905	0.6	4	0.9	6	50	0.55
G9B80007	0.7	4	1.1	4	50	0.65
G9B80906	0.7	4	1.1	6	50	0.65
G9B80008	0.8	4	1.2	4	50	0.75
G9B80907	0.8	4	1.2	6	50	0.75
G9B80908	0.8	4	1.2	8	50	0.75
G9B80009	0.9	4	1.4	6	50	0.85
G9B80910	0.9	4	1.4	10	50	0.85
G9B80010	1.0	4	1.5	6	50	0.95
G9B80911	1.0	4	1.5	8	50	0.95
G9B80912	1.0	4	1.5	10	50	0.95
G9B80913	1.0	4	1.5	12	50	0.95
G9B80012	1.2	4	1.8	6	50	1.15
G9B80914	1.2	4	1.8	8	50	1.15
G9B80915	1.2	4	1.8	10	50	1.15
G9B80916	1.2	4	1.8	12	50	1.15

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													

K-2 END MILLS

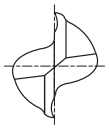
PLAIN SHANK **G9B80 SERIES**

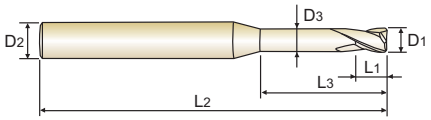
CARBIDE, 2 FLUTE RIB PROCESSING

VOLLHARTMETALL, 2 SCHNEIDEN SCHMALE RIPPEN
FRAISE CARBURE, 2 DENTS POUR USINAGE DE RAINURE
2 TAGLIENTI, SCARICATA PER NERVATURE

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ 2 flute design for slotting.

- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.
- ▶ 2 Schneiden zum Nutenfräsen.





CARBIDE | 2 | 30° | DIN 6535HA | TiAlN

p.C620~C621

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	D1	D2	L1	L3	D3	D3
G9B80030	3.0	6	4.5	8	50	2.85
G9B80934	3.0	6	4.5	12	50	2.85
G9B80935	3.0	6	4.5	16	60	2.85
G9B80936	3.0	6	4.5	20	60	2.85
G9B80937	3.0	6	4.5	25	75	2.85
G9B80040	4.0	6	6	12	50	3.85
G9B80938	4.0	6	6	16	60	3.85
G9B80940	4.0	6	6	25	75	3.85
G9B80941	4.0	6	6	30	75	3.85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○													

K-2 END MILLS

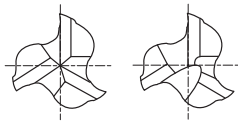
FLAT SHANK **G9410** SERIES
PLAIN SHANK **G9553** SERIES

CARBIDE, 3 FLUTE SHORT LENGTH THROW AWAY

VOLLHARTMETALL, 3 SCHNEIDEN KURZ EINWEGFRÄSER
FRAISE CARBURE, 3 DENTS, À JETER, COURTE
3 TAGLIENTI, SERIE EXTRA CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schaftfräsern.



under Ø2mm from Ø2mm

CARBIDE | 3 | 30° | PLAIN | FLAT | TiAlN

p.C622~C623

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT				
-	G9410100	10.0	10	13	50
-	G9410120	12.0	12	15	55
-	G9410140	14.0	14	15	58
-	G9410160	16.0	16	18	62
-	G9410180	18.0	18	20	70
-	G9410200	20.0	20	22	75

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

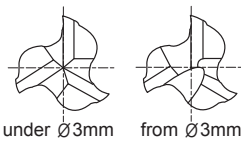
PLAIN SHANK **G9425** SERIES

CARBIDE, 3 FLUTE SHORT LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN KURZ
FRAISE CARBURE, 3 DENTS, COURTE
3 TAGLIENTI, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schaftfräsern.



CARBIDE | 3 | 30° | DIN 6535HA | TiAlN

p.C622~C623

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9425010	1.0	4	3	40
G9425015	1.5	4	4.5	40
G9425020	2.0	2	8	32
G9425025	2.5	2.5	8	32
G9425030	3.0	3	12	32
G9425035	3.5	3.5	12	32
G9425040	4.0	4	12	40
G9425045	4.5	4.5	14	50
G9425050	5.0	5	14	50
G9425055	5.5	5.5	16	50
G9425060	6.0	6	16	50
G9425070	7.0	7	20	60
G9425080	8.0	8	20	60
G9425090	9.0	9	20	60
G9425100	10.0	10	22	70
G9425120	12.0	12	22	70
G9425140	14.0	14	25	75
G9425160	16.0	16	25	75
G9425200	20.0	20	32	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

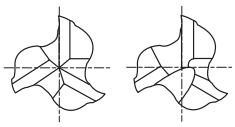
FLAT SHANK **G9439** SERIES

CARBIDE, 3 FLUTE SHORT LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN KURZ
FRAISE CARBURE, 3 DENTS, COURTE
3 TAGLIENTI, SERIE CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schaftfräsern.



CARBIDE | DIN 6527 | 3 | ≈30° | DIN 6535HB | TiAlN

p.C622~C623

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9439020	2.0	6	3	50
G9439030	3.0	6	4	50
G9439035	3.5	6	4	50
G9439040	4.0	6	5	54
G9439045	4.5	6	5	54
G9439050	5.0	6	6	54
G9439060	6.0	6	7	54
G9439070	7.0	8	8	58
G9439080	8.0	8	9	58
G9439090	9.0	10	10	66
G9439100	10.0	10	11	66
G9439120	12.0	12	12	73
G9439140	14.0	14	14	75
G9439160	16.0	16	16	82
G9439180	18.0	18	18	84
G9439200	20.0	20	20	92

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

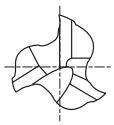
FLAT SHANK **G9433** SERIES

CARBIDE, 3 FLUTE LONG LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN LANG
FRAISE CARBURE, 3 DENTS, LONGUE
3 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 3 flute design possesses the advantage of 2 flute and 4 flute end mill.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 3 Schneiden verbinden die Vorteile von 2 - und 4 - schneidigen Schaftfräsern.



CARBIDE | DIN 6527 | 3 | ≈30° | DIN 6535HB | TiAlN

p.C622~C623

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9433030	3.0	6	7	57
G9433040	4.0	6	8	57
G9433050	5.0	6	10	57
G9433060	6.0	6	10	57
G9433080	8.0	8	16	63
G9433090	9.0	10	16	72
G9433100	10.0	10	19	72
G9433120	12.0	12	22	83
G9433140	14.0	14	22	83
G9433160	16.0	16	26	92
G9433180	18.0	18	26	92
G9433200	20.0	20	32	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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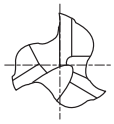
K-2 END MILLS

FLAT SHANK **G9447** SERIES

CARBIDE, 3 FLUTE 45° HELIX, LONG LENGTH

VOLLHARTMETALL, 3 SCHNEIDEN 45° RECHTSSPIRALE LANG
FRAISE CARBURE, 3 DENTS, HÉLICE 45°, LONGUE
3 TAGLIENTI, ELICA 45°, SERIE LUNGA

- ▶ Suitable for dry milling applications at high temperatures.
- ▶ Excellent high-performance end mills.
- ▶ Für die Trockenbearbeitung.
- ▶ Hervorragendes Preis - Leistungsverhältnis.



CARBIDE | DIN 6527 | 3 | 45° | DIN 6535HB | TiAlN

p.C622~C623

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9447030	3.0	6	7	57
G9447035	3.5	6	7	57
G9447040	4.0	6	8	57
G9447045	4.5	6	8	57
G9447050	5.0	6	10	57
G9447060	6.0	6	10	57
G9447070	7.0	8	13	63
G9447080	8.0	8	16	63
G9447090	9.0	10	16	72
G9447100	10.0	10	19	72
G9447120	12.0	12	22	83
G9447140	14.0	14	22	83
G9447160	16.0	16	26	92
G9447180	18.0	18	26	92
G9447200	20.0	20	32	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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K-2 END MILLS

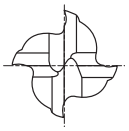
PLAIN SHANK **G9432** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
FRAISE CARBURE, 4 DENTS, COURTE
4 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.



CARBIDE | 4 | 30° | DIN 6535HA | TiAlN

p.C624

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9432010	1.0	4	3	40
G9432015	1.5	4	4.5	40
G9432020	2.0	2	8	32
G9432025	2.5	2.5	8	32
G9432030	3.0	3	12	32
G9432035	3.5	3.5	12	32
G9432040	4.0	4	12	40
G9432045	4.5	4.5	14	50
G9432050	5.0	5	14	50
G9432055	5.5	5.5	16	50
G9432060	6.0	6	16	50
G9432070	7.0	7	20	60
G9432080	8.0	8	20	60
G9432090	9.0	9	20	60
G9432100	10.0	10	22	70
G9432120	12.0	12	22	70
G9432140	14.0	14	25	75
G9432160	16.0	16	25	75
G9432200	20.0	20	32	100

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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K-2 END MILLS

PLAIN SHANK **G9A69** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN KURZ
FRAISE CARBURE, 4 DENTS, COURTE
4 TAGLIENTI, CORTA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.

CARBIDE | 4 | 30° | DIN 6535HA | TiAlN

p.C624

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9A69010	1.0	3	3	39
G9A69015	1.5	3	5	39
G9A69020	2.0	3	7	39
G9A69025	2.5	3	7	39
G9A69030	3.0	3	10	39
G9A69040	4.0	4	14	51
G9A69050	5.0	5	16	51
G9A69060	6.0	6	19	64
G9A69080	8.0	8	21	64
G9A69100	10.0	10	22	70
G9A69120	12.0	12	25	76
G9A69160	16.0	16	32	89
G9A69200	20.0	20	38	102

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

K-2 END MILLS

PLAIN SHANK **G9540** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

VOLLHARTMETALL, 4 SCHNEIDEN LANG
FRAISE CARBURE, 4 DENTS, LONGUE
4 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.

CARBIDE | DIN 6528 | 4 | ≈30° | DIN 6535HA | TiAlN p.C624

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9540035	3.5	3.5	10	50
G9540040	4.0	4	11	50
G9540045	4.5	4.5	11	50
G9540050	5.0	5	13	50
G9540055	5.5	5.5	13	57
G9540060	6.0	6	13	57
G9540065	6.5	6.5	16	60
G9540070	7.0	7	16	60
G9540075	7.5	7.5	19	63
G9540080	8.0	8	19	63
G9540085	8.5	8.5	19	67
G9540090	9.0	9	19	67
G9540095	9.5	9.5	22	72
G9540100	10.0	10	22	72
G9540110	11.0	11	26	83
G9540120	12.0	12	26	83
G9540130	13.0	13	26	83
G9540140	14.0	14	26	83
G9540150	15.0	15	32	92
G9540160	16.0	16	32	92
G9540180	18.0	18	32	92
G9540200	20.0	20	38	104

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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K-2 END MILLS

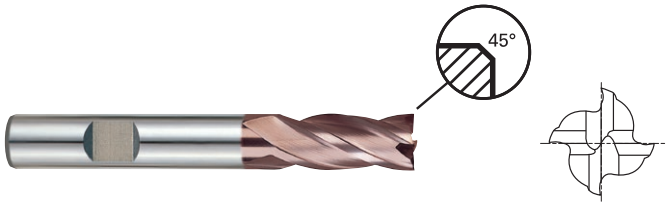
FLAT SHANK **G9G51** SERIES

CARBIDE, 4 FLUTE LONG LENGTH WITH CHAMFER

VOLLHARTMETALL, 4 SCHNEIDEN LANG
FRAISE CARBURE, 4 DENTS, LONGUE
4 TAGLIENTI, SERIE LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.
- 4 flute allows for better work piece finishes.

- Für die Trockenbearbeitung.
- Hervorragendes Preis - Leistungsverhältnis.
- 4 Schneiden erzeugen eine bessere Oberflächengüte des Werkstücks.

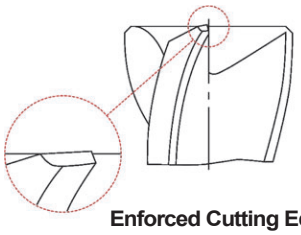


CARBIDE | DIN 6527 | 4 | 30° | DIN 6535HB | C x 45° | TiAlN p.C624

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
G9G51030	3.0	6	8	57	0.10
G9G51040	4.0	6	11	57	0.10
G9G51050	5.0	6	13	57	0.10
G9G51060	6.0	6	13	57	0.10
G9G51080	8.0	8	19	63	0.13
G9G51100	10.0	10	22	72	0.13
G9G51120	12.0	12	26	83	0.18
G9G51140	14.0	14	26	83	0.18
G9G51160	16.0	16	32	92	0.18
G9G51200	20.0	20	38	104	0.23

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○	○			○	

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YG-1 CO., LTD.

K-2 END MILLS

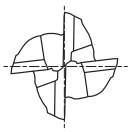
PLAIN SHANK **G9H75** SERIES
FLAT SHANK **G9H76** SERIES

CARBIDE, 4 FLUTE MULTIPLE HELIX LONG LENGTH WITH CHAMFER

HARTMETALL, 4-SCHNEIDEN-VARIABLER LANG LÄNGE MIT FASE
FRAISE CARBURE, 4 DENTS, HÉLICE MULTIPLE, LONGUE
MD, 4 TAGLIENTI, PASSO ED ELICA DIFFERENZIATI, CON SMUSSO 45° - SERIE LUNGA

- New Coating enhances heat and oxidation resistance
- Multiple Helix Designed for Optimal Chip Formation and Chip Evacuation
- Unique Geometry applied to Reduce Vibration

- Neue Beschichtung verbessert die Hitze- und Oxidationsbeständigkeit
- Multiple Helix Design zur Reduzierung von Vibrationen
- Einzigartige Geometrie für optimale Spanbildung und Spanabfuhr

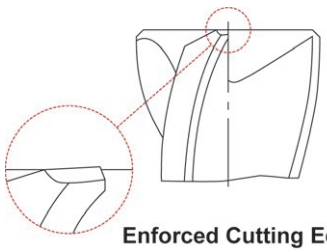


CARBIDE | DIN 6527 | 4 | 35°/37° | PLAIN | FLAT | C x 45° | X Coating p.C625

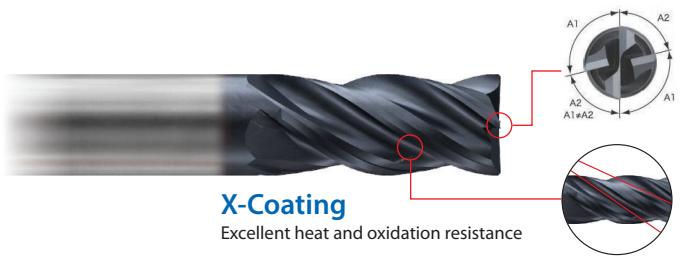
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
PLAIN	FLAT					
G9H75030N	G9H76030N	3.0	6	8	57	0.10
G9H75040N	G9H76040N	4.0	6	11	57	0.15
G9H75050N	G9H76050N	5.0	6	13	57	0.15
G9H75060N	G9H76060N	6.0	6	13	57	0.20
G9H75080N	G9H76080N	8.0	8	19	63	0.20
G9H75100N	G9H76100N	10.0	10	22	72	0.30
G9H75120N	G9H76120N	12.0	12	26	83	0.35
G9H75160N	G9H76160N	16.0	16	32	92	0.40
G9H75200N	G9H76200N	20.0	20	38	104	0.50

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge



X-Coating
Excellent heat and oxidation resistance

Unequal Index
Exclusively Designed Unique Geometry applied to Reduce Vibration and also to achieve Excellent Chip Evacuation with Better Surface Finish

Multiple Helix
Multiple Helix Designed for Optimal Chip Formation and Chip Evacuation Concluding Faster and Heavier Cutting making Higher Productivity

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend											○	○	○	○	○	○	○				

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YG-1 CO., LTD.

K-2 END MILLS

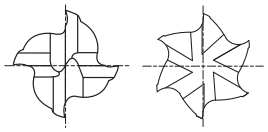
PLAIN SHANK **G9F45** SERIES
PLAIN SHANK **G9F46** SERIES

CARBIDE, 4&6 FLUTE 45° HELIX SHORT / LONG LENGTH

VOLLHARTMETALL, 4&6 SCHNEIDEN 45° RECHTSSPIRALE KURZ / LANG
FRAISE CARBURE, 4&6 DENTS, HÉLICE 45°, COURTE / LONGUE
4&6 TAGLIENTI, ELICA 45°, SERIE CORTA / LUNGA

- Suitable for dry milling applications at high temperatures.
- Excellent high-performance end mills.

- Für die Trockenbearbeitung geeignet.
- Exzellente Hochleistungs Mühlen.



CARBIDE | 4&6 | 45° | DIN 6535HA | TiAlN

p.C626

SHORT

Unit : mm

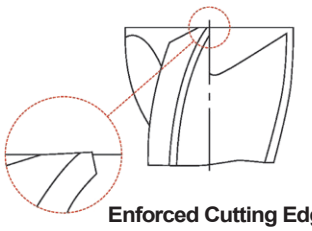
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
G9F45030	3.0	4	8	50	4
G9F45040	4.0	4	11	50	4
G9F45050	5.0	6	13	50	6
G9F45060	6.0	6	16	50	6
G9F45100	10.0	10	22	75	6
G9F45120	12.0	12	26	75	6
G9F45160	16.0	16	32	100	6
G9F45180	18.0	18	38	100	6
G9F45200	20.0	20	38	100	6

LONG

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
G9F46120	12.0	12	50	100	6
G9F46160	16.0	16	65	150	6
G9F46200	20.0	20	70	150	6

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○	○	○	○	○	○	○	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																		○	○	○	○

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YG-1 CO., LTD.

K-2 END MILLS

PLAIN SHANK **G9400** SERIES

CARBIDE, 2 FLUTE DRILL MILLS

VOLLHARTMETALL, 2 SCHNEIDEN BOHRNUTEN FRÄSER
FRAISE FORET CARBURE, 2 DENTS, MULTI-FONCTIONS
2 TAGLIENTI, FRESA IN MD A 90°

CARBIDE | YG STD | 2 | 30° | DIN 6535HA | TiAlN

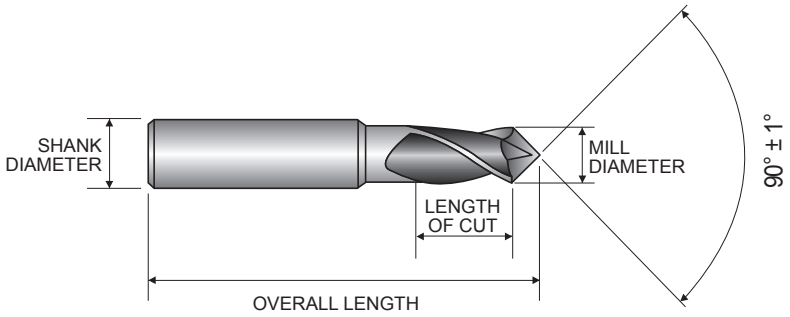
p.C628~C630

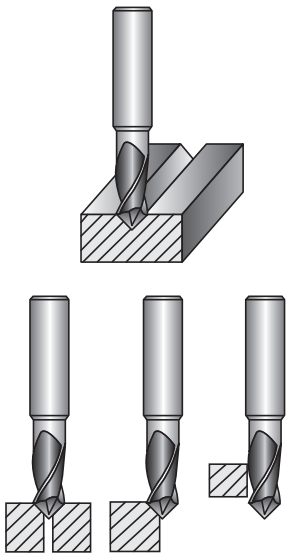
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
G9400030	3.0	4	6	50
G9400040	4.0	5	8	50
G9400050	5.0	6	10	50
G9400060	6.0	8	12	60
G9400080	8.0	10	16	70
G9400100	10.0	12	18	70
G9400120	12.0	12	20	70
G9400140	14.0	14	24	80
G9400160	16.0	16	26	80
G9400200	20.0	20	32	100

▶ TiN, TiCN and TiAlN Coatings are available on your request.

- Performs many drilling and milling operations that are not presently done with the standard end mill.
- Among the many vertical milling machine operations, applications for the Drill Mill are: Drilling, Slotting, NC Milling, Drilling & Slotting, Profile Milling and Chamfering.





Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
Ø3 ~ Ø10=h9 Ø12 ~ Ø20=d9	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

K-2 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

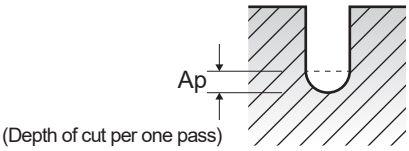
G9B81 SERIES — **2 FLUTE BALL NOSE**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.4	0.5	0.6	0.8	1.0
P	1-4	Non-alloy steel	Vc	33~43	41~53	50~64	66~85	77~97
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010
			RPM	26350~34000	26350~34000	26350~34000	26350~34000	24650~31000
			FEED	150~415	150~415	190~535	190~535	210~595
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090
	5		Vc	24~30	30~38	36~46	48~61	55~69
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.007
			RPM	19100~24200	19100~24200	19100~24200	19100~24200	17400~22100
			FEED	75~230	75~230	95~300	95~300	105~330
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090
	6-7	Low alloy steel	Vc	33~43	41~53	50~64	66~85	77~97
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010
			RPM	26350~34000	26350~34000	26350~34000	26350~34000	24650~31000
			FEED	150~415	150~415	190~535	190~535	210~595
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090
	8-9		Vc	24~30	30~38	36~46	48~61	55~69
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.007
			RPM	19100~24200	19100~24200	19100~24200	19100~24200	17400~22100
			FEED	75~230	75~230	95~300	95~300	105~330
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090
	10	High alloyed steel, and tool steel	Vc	33~43	41~53	50~64	66~85	77~97
			fz	0.003~0.006	0.003~0.006	0.004~0.008	0.004~0.008	0.004~0.010
			RPM	26350~34000	26350~34000	26350~34000	26350~34000	24650~31000
			FEED	150~415	150~415	190~535	190~535	210~595
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090
	11.1 - 11.2		Vc	24~30	30~38	36~46	48~61	55~69
			fz	0.002~0.005	0.002~0.005	0.002~0.006	0.002~0.006	0.003~0.007
			RPM	19100~24200	19100~24200	19100~24200	19100~24200	17400~22100
			FEED	75~230	75~230	95~300	95~300	105~330
			Ap	0.018~0.036	0.023~0.045	0.027~0.054	0.036~0.072	0.045~0.090

※ The FEED, in long & extra long types, should be reduced by around 50%

▶ NEXT PAGE



K-2 END MILLS

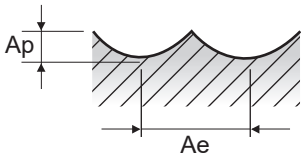
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9634 SERIES — **4 FLUTE BALL NOSE**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	1-4	Non-alloy steel	0.2D	Vc	85	110	110	125	135	155	170	190	200	205	215	225
				fz	0.013	0.019	0.027	0.033	0.046	0.068	0.089	0.112	0.124	0.136	0.14	0.15
				RPM	13528	11671	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581
				FEED	703	887	945	1050	1318	1677	1926	2258	2255	2219	2129	2149
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	5		0.2D	Vc	65	80	90	95	110	125	135	150	160	160	170	175
				fz	0.01	0.017	0.024	0.03	0.046	0.06	0.076	0.089	0.099	0.108	0.111	0.119
				RPM	10345	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785
				FEED	414	577	688	726	1074	1194	1306	1416	1441	1375	1335	1326
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	6-7	Low alloy steel	0.2D	Vc	85	110	110	125	135	155	170	190	200	205	215	225
				fz	0.013	0.019	0.027	0.033	0.046	0.068	0.089	0.112	0.124	0.136	0.14	0.15
				RPM	13528	11671	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581
				FEED	703	887	945	1050	1318	1677	1926	2258	2255	2219	2129	2149
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	8-9		0.2D	Vc	65	80	90	95	110	125	135	150	160	160	170	175
				fz	0.01	0.017	0.024	0.03	0.046	0.06	0.076	0.089	0.099	0.108	0.111	0.119
				RPM	10345	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785
				FEED	414	577	688	726	1074	1194	1306	1416	1441	1375	1335	1326
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	10	High alloyed steel, and tool steel	0.2D	Vc	85	110	110	125	135	155	170	190	200	205	215	225
				fz	0.013	0.019	0.027	0.033	0.046	0.068	0.089	0.112	0.124	0.136	0.14	0.15
				RPM	13528	11671	8754	7958	7162	6167	5411	5040	4547	4078	3802	3581
				FEED	703	887	945	1050	1318	1677	1926	2258	2255	2219	2129	2149
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	11.1 - 11.2		0.2D	Vc	65	80	90	95	110	125	135	150	160	160	170	175
				fz	0.01	0.017	0.024	0.03	0.046	0.06	0.076	0.089	0.099	0.108	0.111	0.119
				RPM	10345	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785
				FEED	414	577	688	726	1074	1194	1306	1416	1441	1375	1335	1326
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	Vc	65	65	65	65	65	65	65	65	60	65	60	65
				fz	0.008	0.012	0.021	0.03	0.04	0.068	0.083	0.097	0.125	0.135	0.159	0.15
				RPM	10345	6897	5173	4138	3448	2586	2069	1724	1364	1293	1061	1035
				FEED	331	331	434	497	552	703	687	669	682	698	675	621
				Ap	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
N	21~22	Aluminum-wrought alloy	0.7D	Vc	195	195	195	190	195	200	195	195	190	195	190	185
				fz	0.005	0.007	0.01	0.015	0.017	0.026	0.033	0.046	0.055	0.053	0.06	0.069
				RPM	31035	20690	15518	12096	10345	7958	6207	5173	4320	3879	3360	2944
				FEED	621	579	621	726	703	828	819	952	950	822	806	813
				Ap	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	23~25	Aluminum-cast, alloyed	0.7D	Vc	195	195	195	190	195	200	195	195	190	195	190	185
				fz	0.005	0.007	0.01	0.015	0.017	0.026	0.033	0.046	0.055	0.053	0.06	0.069
				RPM	31035	20690	15518	12096	10345	7958	6207	5173	4320	3879	3360	2944
				FEED	621	579	621	726	703	828	819	952	950	822	806	813
				Ap	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
H	38.1	Hardened steel	0.2D	Vc	25	35	45	50	50	55	55	55	55	55	60	60
				fz	0.008	0.012	0.016	0.019	0.022	0.034	0.041	0.053	0.062	0.073	0.076	0.084
				RPM	3979	3714	3581	3183	2653	2188	1751	1459	1251	1094	1061	955
				FEED	127	178	229	242	233	298	287	309	310	320	323	321
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	40	Chilled Cast Iron	0.2D	Vc	65	80	90	95	110	125	135	150	160	160	170	175
				fz	0.01	0.017	0.024	0.03	0.046	0.06	0.076	0.089	0.099	0.108	0.111	0.119
				RPM	10345	8488	7162	6048	5836	4974	4297	3979	3638	3183	3006	2785
				FEED	414	577	688	726	1074	1194	1306	1416	1441	1375	1335	1326
				Ap	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3

※ The FEED, in long & extra long types, should be reduced by around 50%



K-2 END MILLS

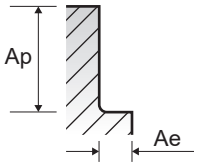
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9B84, G9B85 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387
					FEED	140	233	229	267	484	519	554	616	509	449
	5		0.1D	1.0D	Vc	30	35	40	45	50	50	55	55	55	55
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459
					FEED	76	119	153	172	302	306	362	333	266	216
	6-7	Low alloy steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387
					FEED	140	233	229	267	484	519	554	616	509	449
	8-9		0.1D	1.0D	Vc	30	35	40	45	50	50	55	55	55	55
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459
					FEED	76	119	153	172	302	306	362	333	266	216
	10	High alloyed steel, and tool steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387
					FEED	140	233	229	267	484	519	554	616	509	449
	11.1 - 11.2		0.1D	1.0D	Vc	30	35	40	45	50	50	55	55	55	55
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459
					FEED	76	119	153	172	302	306	362	333	266	216
M	14.1	Stainless steel	0.1D	1.0D	Vc	25	35	35	35	40	40	45	45	45	45
					fz	0.002	0.004	0.006	0.009	0.018	0.024	0.029	0.042	0.044	0.045
					RPM	7958	7427	5570	3714	3183	2546	2387	1790	1432	1194
					FEED	64	119	134	134	229	244	277	301	252	215
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	60	55	60	55	60	55	55	55	60	55
					fz	0.008	0.013	0.017	0.026	0.035	0.044	0.065	0.093	0.116	0.155
					RPM	19099	11671	9549	5836	4775	3501	2918	2188	1910	1459
					FEED	611	607	649	607	668	616	759	814	886	905
N	21~22	Aluminum-wrought alloy	0.1D	1.5D	Vc	140	130	140	145	140	145	145	145	145	140
					fz	0.006	0.011	0.015	0.021	0.03	0.036	0.047	0.063	0.078	0.095
					RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714
					FEED	1070	1214	1337	1292	1337	1329	1446	1454	1440	1411
	23~25	Aluminum-cast, alloyed	0.1D	1.5D	Vc	140	130	140	145	140	145	145	145	145	140
					fz	0.006	0.011	0.015	0.021	0.03	0.036	0.047	0.063	0.078	0.095
					RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714
					FEED	1070	1214	1337	1292	1337	1329	1446	1454	1440	1411
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	Vc	80	95	105	105	110	105	105	110	105	105
					fz	0.006	0.011	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096
					RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785
					FEED	611	887	1070	1070	1015	1016	1070	1103	1083	1070
	29.1	Non Metallic Materials	0.1D	1.5D	Vc	80	95	105	105	110	105	105	110	105	105
					fz	0.006	0.011	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096
					RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785
					FEED	611	887	1070	1070	1015	1016	1070	1103	1083	1070
H	40	Chilled Cast Iron	0.1D	1.0D	Vc	30	35	40	45	50	50	55	55	55	55
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459
					FEED	76	119	153	172	302	306	362	333	266	216

※ The FEED, in long & extra long types, should be reduced by around 50%



K-2 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9B80 SERIES — **2 FLUTE - SLOTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min
Ap = mm

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.4	0.5	0.6	0.7	0.8	0.9	1.0
P	1-4	Non-alloy steel	Vc	33~43	42~53	50~64	58~75	58~75	61~76	60~75
			fz	0.003~0.005	0.003~0.005	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.011	0.006~0.014
			RPM	26500~34000	26500~34000	26500~34000	26500~34000	23000~30000	21500~27000	19000~24000
			FEED	170~370	170~370	210~485	210~485	240~535	240~610	240~690
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090
	5		Vc	24~30	30~38	36~45	42~53	41~53	42~54	42~53
			fz	0.002~0.006	0.002~0.006	0.003~0.008	0.003~0.008	0.003~0.010	0.005~0.012	0.006~0.015
			RPM	19000~24000	19000~24000	19000~24000	19000~24000	16500~21000	15000~19000	13500~17000
			FEED	72~290	72~290	95~365	95~365	100~410	135~460	160~510
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090
	6-7	Low alloy steel	Vc	33~43	42~53	50~64	58~75	58~75	61~76	60~75
			fz	0.003~0.005	0.003~0.005	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.011	0.006~0.014
			RPM	26500~34000	26500~34000	26500~34000	26500~34000	23000~30000	21500~27000	19000~24000
			FEED	170~370	170~370	210~485	210~485	240~535	240~610	240~690
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090
	8-9		Vc	24~30	30~38	36~45	42~53	41~53	42~54	42~53
			fz	0.002~0.006	0.002~0.006	0.003~0.008	0.003~0.008	0.003~0.010	0.005~0.012	0.006~0.015
			RPM	19000~24000	19000~24000	19000~24000	19000~24000	16500~21000	15000~19000	13500~17000
			FEED	72~290	72~290	95~365	95~365	100~410	135~460	160~510
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090
	10	High alloyed steel, and tool steel	Vc	33~43	42~53	50~64	58~75	58~75	61~76	60~75
			fz	0.003~0.005	0.003~0.005	0.004~0.007	0.004~0.007	0.005~0.009	0.006~0.011	0.006~0.014
			RPM	26500~34000	26500~34000	26500~34000	26500~34000	23000~30000	21500~27000	19000~24000
			FEED	170~370	170~370	210~485	210~485	240~535	240~610	240~690
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090
	11.1 - 11.2		Vc	24~30	30~38	36~45	42~53	41~53	42~54	42~53
			fz	0.002~0.006	0.002~0.006	0.003~0.008	0.003~0.008	0.003~0.010	0.005~0.012	0.006~0.015
			RPM	19000~24000	19000~24000	19000~24000	19000~24000	16500~21000	15000~19000	13500~17000
			FEED	72~290	72~290	95~365	95~365	100~410	135~460	160~510
			Ap	0.007~0.018	0.009~0.022	0.011~0.026	0.012~0.031	0.014~0.035	0.030~0.060	0.045~0.090

※ The FEED, in long & extra long types, should be reduced by around 50%

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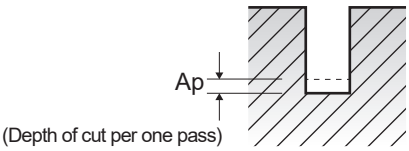


K-2 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

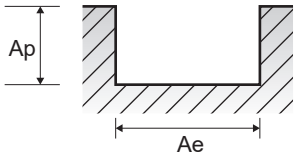
G9553, G9G46, G9410, G9425, G9G47, G9439 G9528, G9433, G9G48, G9447, G9G49 SERIES

3 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-4	Non-alloy steel	1.0D	0.5D (Up to Ø3 : 0.2D)	Vc	45	60	50	55	65	70	70	70	70	70	75	75	70
					fz	0.002	0.003	0.005	0.007	0.012	0.015	0.018	0.027	0.03	0.031	0.029	0.029	0.029
					RPM	14324	12732	7958	5836	5173	4456	3714	2785	2228	1857	1705	1492	1114
					FEED	86	115	119	123	186	201	201	226	201	173	148	130	97
	5		1.0D	0.5D (Up to Ø3 : 0.2D)	Vc	25	25	30	35	40	40	45	45	40	45	45	50	45
					fz	0.002	0.004	0.005	0.007	0.012	0.014	0.02	0.024	0.023	0.022	0.022	0.023	0.024
					RPM	7958	5305	4775	3714	3183	2546	2387	1790	1273	1194	1023	995	716
					FEED	48	64	72	78	115	107	143	129	88	79	68	69	52
	6-7	Low alloy steel	1.0D	0.5D (Up to Ø3 : 0.2D)	Vc	45	60	50	55	65	70	70	70	70	70	75	75	70
					fz	0.002	0.003	0.005	0.007	0.012	0.015	0.018	0.027	0.03	0.031	0.029	0.029	0.029
					RPM	14324	12732	7958	5836	5173	4456	3714	2785	2228	1857	1705	1492	1114
					FEED	86	115	119	123	186	201	201	226	201	173	148	130	97
	8-9		1.0D	0.5D (Up to Ø3 : 0.2D)	Vc	25	25	30	35	40	40	45	45	40	45	45	50	45
					fz	0.002	0.004	0.005	0.007	0.012	0.014	0.02	0.024	0.023	0.022	0.022	0.023	0.024
					RPM	7958	5305	4775	3714	3183	2546	2387	1790	1273	1194	1023	995	716
					FEED	48	64	72	78	115	107	143	129	88	79	68	69	52
	10	High alloyed steel, and tool steel	1.0D	0.5D (Up to Ø3 : 0.2D)	Vc	45	60	50	55	65	70	70	70	70	70	75	75	70
					fz	0.002	0.003	0.005	0.007	0.012	0.015	0.018	0.027	0.03	0.031	0.029	0.029	0.029
					RPM	14324	12732	7958	5836	5173	4456	3714	2785	2228	1857	1705	1492	1114
					FEED	86	115	119	123	186	201	201	226	201	173	148	130	97
	11.1 - 11.2		1.0D	0.5D (Up to Ø3 : 0.2D)	Vc	25	25	30	35	40	40	45	45	40	45	45	50	45
					fz	0.002	0.004	0.005	0.007	0.012	0.014	0.02	0.024	0.023	0.022	0.022	0.023	0.024
					RPM	7958	5305	4775	3714	3183	2546	2387	1790	1273	1194	1023	995	716
					FEED	48	64	72	78	115	107	143	129	88	79	68	69	52
M	14.1	Stainless steel	1.0D	0.5D (Up to Ø3 : 0.2D)	Vc	20	25	25	30	35	35	35	35	35	35	35	35	35
					fz	0.002	0.003	0.004	0.007	0.011	0.015	0.019	0.025	0.028	0.026	0.027	0.031	0.03
					RPM	6366	5305	3979	3183	2785	2228	1857	1393	1114	928	796	696	557
					FEED	38	48	48	67	92	100	106	104	94	72	64	65	50
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	Vc	60	55	60	55	60	55	55	55	60	55	55	55	55
					fz	0.003	0.005	0.007	0.011	0.013	0.018	0.026	0.036	0.046	0.063	0.073	0.086	0.115
					RPM	19099	11671	9549	5836	4775	3501	2918	2188	1910	1459	1251	1094	875
					FEED	172	175	201	193	186	189	228	236	264	276	274	282	302
N	21~22	Aluminum-wrought alloy	1.0D	1.0D	Vc	140	130	140	145	140	145	145	145	145	140	145	145	140
					fz	0.002	0.004	0.006	0.009	0.013	0.015	0.019	0.026	0.032	0.038	0.043	0.05	0.065
					RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714	3297	2885	2228
					FEED	267	331	401	415	434	415	438	450	443	423	425	433	434
	23~25	Aluminum-cast, alloyed	1.0D	1.0D	Vc	140	130	140	145	140	145	145	145	145	140	145	145	140
					fz	0.002	0.004	0.006	0.009	0.013	0.015	0.019	0.026	0.032	0.038	0.043	0.05	0.065
					RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714	3297	2885	2228
					FEED	267	331	401	415	434	415	438	450	443	423	425	433	434
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	Vc	80	95	105	105	110	105	105	110	105	105	105	110	105
					fz	0.002	0.004	0.006	0.009	0.012	0.015	0.02	0.025	0.032	0.039	0.046	0.05	0.065
					RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785	2387	2188	1671
					FEED	153	242	301	301	315	301	334	328	321	326	329	328	326
	29.1	Non Metallic Materials	1.0D	1.0D	Vc	80	95	105	105	110	105	105	110	105	105	105	110	105
					fz	0.002	0.004	0.006	0.009	0.012	0.015	0.02	0.025	0.032	0.039	0.046	0.05	0.065
					RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785	2387	2188	1671
					FEED	153	242	301	301	315	301	334	328	321	326	329	328	326
H	40	Chilled Cast Iron	1.0D	0.5D (Up to Ø3 : 0.2D)	Vc	25	25	30	35	40	40	45	45	40	45	45	50	45
					fz	0.002	0.004	0.005	0.007	0.012	0.014	0.02	0.024	0.023	0.022	0.022	0.023	0.024
					RPM	7958	5305	4775	3714	3183	2546	2387	1790	1273	1194	1023	995	716
					FEED	48	64	72	78	115	107	143	129	88	79	68	69	52

※ The FEED, in long & extra long types, should be reduced by around 50%



K-2 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

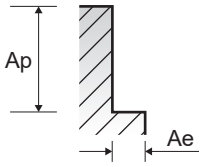
G9432, G9G50, G9A69, G9448, G9540, G9449, G9G51, G9453 SERIES

4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-4	Non-alloy steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90	90	95	90
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047	0.047	0.047	0.047
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387	2046	1890	1432
					FEED	140	233	229	267	484	519	554	616	509	449	385	355	269
	5		0.1D	1.0D	Vc	30	35	40	45	50	50	55	55	55	55	55	60	55
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459	1251	1194	875
					FEED	76	119	153	172	302	306	362	333	266	216	190	177	133
	6-7	Low alloy steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90	90	95	90
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047	0.047	0.047	0.047
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387	2046	1890	1432
					FEED	140	233	229	267	484	519	554	616	509	449	385	355	269
	8-9		0.1D	1.0D	Vc	30	35	40	45	50	50	55	55	55	55	55	60	55
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459	1251	1194	875
					FEED	76	119	153	172	302	306	362	333	266	216	190	177	133
	10	High alloyed steel, and tool steel	0.1D	1.0D	Vc	55	55	60	70	80	85	90	90	85	90	90	95	90
					fz	0.002	0.005	0.006	0.009	0.019	0.024	0.029	0.043	0.047	0.047	0.047	0.047	0.047
					RPM	17507	11671	9549	7427	6366	5411	4775	3581	2706	2387	2046	1890	1432
					FEED	140	233	229	267	484	519	554	616	509	449	385	355	269
	11.1 - 11.2		0.1D	1.0D	Vc	30	35	40	45	50	50	55	55	55	55	55	60	55
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459	1251	1194	875
					FEED	76	119	153	172	302	306	362	333	266	216	190	177	133
M	14.1	Stainless steel	0.1D	1.0D	Vc	25	35	35	35	40	40	45	45	45	45	45	50	45
					fz	0.002	0.004	0.006	0.009	0.018	0.024	0.029	0.042	0.044	0.045	0.045	0.045	0.046
					RPM	7958	7427	5570	3714	3183	2546	2387	1790	1432	1194	1023	995	716
					FEED	64	119	134	134	229	244	277	301	252	215	184	179	132
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	60	55	60	55	60	55	55	55	60	55	55	55	55
					fz	0.008	0.013	0.017	0.026	0.035	0.044	0.065	0.093	0.116	0.155	0.182	0.22	0.288
					RPM	19099	11671	9549	5836	4775	3501	2918	2188	1910	1459	1251	1094	875
					FEED	611	607	649	607	668	616	759	814	886	905	910	963	1008
N	21~22	Aluminum-wrought alloy	0.1D	1.5D	Vc	140	130	140	145	140	145	145	145	145	140	145	145	140
					fz	0.006	0.011	0.015	0.021	0.03	0.036	0.047	0.063	0.078	0.095	0.108	0.125	0.163
					RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714	3297	2885	2228
					FEED	1070	1214	1337	1292	1337	1329	1446	1454	1440	1411	1424	1442	1453
	23~25	Aluminum-cast, alloyed	0.1D	1.5D	Vc	140	130	140	145	140	145	145	145	145	140	145	145	140
					fz	0.006	0.011	0.015	0.021	0.03	0.036	0.047	0.063	0.078	0.095	0.108	0.125	0.163
					RPM	44563	27587	22282	15385	11141	9231	7692	5769	4615	3714	3297	2885	2228
					FEED	1070	1214	1337	1292	1337	1329	1446	1454	1440	1411	1424	1442	1453
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	Vc	80	95	105	105	110	105	105	110	105	105	105	110	105
					fz	0.006	0.011	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096	0.115	0.125	0.162
					RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785	2387	2188	1671
					FEED	611	887	1070	1070	1015	1016	1070	1103	1083	1070	1098	1094	1083
	29.1	Non Metallic Materials	0.1D	1.5D	Vc	80	95	105	105	110	105	105	110	105	105	105	110	105
					fz	0.006	0.011	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096	0.115	0.125	0.162
					RPM	25465	20160	16711	11141	8754	6685	5570	4377	3342	2785	2387	2188	1671
					FEED	611	887	1070	1070	1015	1016	1070	1103	1083	1070	1098	1094	1083
H	40	Chilled Cast Iron	0.1D	1.0D	Vc	30	35	40	45	50	50	55	55	55	55	55	60	55
					fz	0.002	0.004	0.006	0.009	0.019	0.024	0.031	0.038	0.038	0.037	0.038	0.037	0.038
					RPM	9549	7427	6366	4775	3979	3183	2918	2188	1751	1459	1251	1194	875
					FEED	76	119	153	172	302	306	362	333	266	216	190	177	133

※ The FEED, in long & extra long types, should be reduced by around 50%



K-2 END MILLS

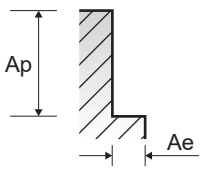
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9F45, G9F46 SERIES — 4&6 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	1-4	Non-alloy steel	0.05D	1.5D	Vc	82	83	98	98	97	97	99	98	98	97	97
					fz	0.024	0.033	0.025	0.03	0.045	0.045	0.053	0.058	0.062	0.065	0.069
					RPM	8700	6605	6239	5199	3860	3088	2626	2228	1950	1715	1544
					FEED	835	872	936	936	1042	834	835	775	725	669	639
	5		0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	65	65	64
					fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.066	0.07
					RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019
					FEED	550	578	670	621	590	550	557	513	481	455	428
	6-7	Low alloy steel	0.05D	1.5D	Vc	82	83	98	98	97	97	99	98	98	97	97
					fz	0.024	0.033	0.025	0.03	0.045	0.045	0.053	0.058	0.062	0.065	0.069
					RPM	8700	6605	6239	5199	3860	3088	2626	2228	1950	1715	1544
					FEED	835	872	936	936	1042	834	835	775	725	669	639
	8-9		0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	65	65	64
					fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.066	0.07
					RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019
					FEED	550	578	670	621	590	550	557	513	481	455	428
	10	High alloyed steel, and tool steel	0.05D	1.5D	Vc	82	83	98	98	97	97	99	98	98	97	97
					fz	0.024	0.033	0.025	0.03	0.045	0.045	0.053	0.058	0.062	0.065	0.069
					RPM	8700	6605	6239	5199	3860	3088	2626	2228	1950	1715	1544
					FEED	835	872	936	936	1042	834	835	775	725	669	639
	11.1 ~ 11.2		0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	65	65	64
					fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.066	0.07
					RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019
					FEED	550	578	670	621	590	550	557	513	481	455	428
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.5D	Vc	82	83	98	98	97	97	99	98	98	97	97
					fz	0.024	0.033	0.025	0.03	0.045	0.045	0.053	0.058	0.062	0.065	0.069
					RPM	8700	6605	6239	5199	3860	3088	2626	2228	1950	1715	1544
					FEED	835	872	936	936	1042	834	835	775	725	669	639
H	38.1	Hardened steel	0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	65	65	64
					fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.066	0.07
					RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019
					FEED	550	578	670	621	590	550	557	513	481	455	428
	38.2 ~ 39.1		0.03D	1.5D	Vc	45	45	50	50	50	50	50	50	50	50	50
					fz	0.018	0.025	0.02	0.023	0.029	0.033	0.029	0.041	0.046	0.05	0.052
					RPM	4775	3581	3183	2653	1989	1592	1326	1137	995	884	796
					FEED	344	358	382	366	346	315	231	280	275	265	248
	39.2		0.02D	1D	Vc	35	35	40	40	40	40	40	40	40	40	41
					fz	0.014	0.02	0.016	0.018	0.023	0.027	0.031	0.034	0.037	0.039	0.042
					RPM	3714	2785	2546	2122	1592	1273	1061	909	796	707	653
					FEED	208	223	244	229	220	206	197	186	177	166	164
	40	Chilled Cast Iron	0.03D	1.5D	Vc	54	55	65	65	65	64	66	66	65	65	64
					fz	0.024	0.033	0.027	0.03	0.038	0.045	0.053	0.057	0.062	0.066	0.07
					RPM	5730	4377	4138	3448	2586	2037	1751	1501	1293	1149	1019
					FEED	550	578	670	621	590	550	557	513	481	455	428
	41	Hardened Cast Iron	0.03D	1.5D	Vc	45	45	50	50	50	50	50	50	50	50	50
					fz	0.018	0.025	0.02	0.023	0.029	0.033	0.029	0.041	0.046	0.05	0.052
					RPM	4775	3581	3183	2653	1989	1592	1326	1137	995	884	796
					FEED	344	358	382	366	346	315	231	280	275	265	248

※ The FEED, in long & extra long types, should be reduced by around 50%



K-2 END MILLS

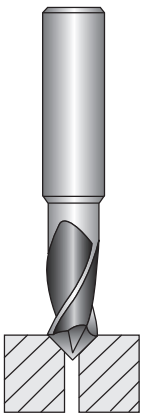
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9400 SERIES — **2 FLUTE DRILL MILLS - CHAMFERING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-2	Non-alloy steel	Vc	60	65	65	60	60	65	70	70	85
			fz	0.025	0.031	0.04	0.052	0.071	0.083	0.1	0.125	0.137
			RPM	6366	5173	4138	3183	2387	2069	1857	1393	1353
			FEED	318	321	331	331	339	343	371	348	371
	3-4		Vc	45	55	55	55	55	55	60	65	65
			fz	0.023	0.027	0.036	0.043	0.058	0.073	0.091	0.105	0.14
			RPM	4775	4377	3501	2918	2188	1751	1592	1293	1035
			FEED	220	236	252	251	254	256	290	272	290
	5		Vc	40	45	45	40	40	50	50	50	55
			fz	0.023	0.028	0.035	0.044	0.06	0.066	0.083	0.115	0.134
			RPM	4244	3581	2865	2122	1592	1592	1326	995	875
			FEED	195	201	201	187	191	210	220	229	235
	6	Low alloy steel	Vc	60	65	65	60	60	65	70	70	85
			fz	0.025	0.031	0.04	0.052	0.071	0.083	0.1	0.125	0.137
			RPM	6366	5173	4138	3183	2387	2069	1857	1393	1353
			FEED	318	321	331	331	339	343	371	348	371
	7		Vc	45	55	55	55	55	55	60	65	65
			fz	0.023	0.027	0.036	0.043	0.058	0.073	0.091	0.105	0.14
			RPM	4775	4377	3501	2918	2188	1751	1592	1293	1035
			FEED	220	236	252	251	254	256	290	272	290
	8-9		Vc	40	45	45	40	40	50	50	50	55
			fz	0.023	0.028	0.035	0.044	0.06	0.066	0.083	0.115	0.134
			RPM	4244	3581	2865	2122	1592	1592	1326	995	875
			FEED	195	201	201	187	191	210	220	229	235
	10	High alloyed steel, and tool steel	Vc	60	65	65	60	60	65	70	70	85
			fz	0.025	0.031	0.04	0.052	0.071	0.083	0.1	0.125	0.137
			RPM	6366	5173	4138	3183	2387	2069	1857	1393	1353
			FEED	318	321	331	331	339	343	371	348	371
	11.1		Vc	40	45	45	40	40	50	50	50	55
			fz	0.023	0.028	0.035	0.044	0.06	0.066	0.083	0.115	0.134
			RPM	4244	3581	2865	2122	1592	1592	1326	995	875
			FEED	195	201	201	187	191	210	220	229	235
M	14.1	Stainless steel	Vc	30	35	40	35	35	40	40	40	45
			fz	0.021	0.025	0.029	0.037	0.055	0.064	0.078	0.11	0.122
			RPM	3183	2785	2546	1857	1393	1273	1061	796	716
			FEED	134	139	148	137	153	163	166	175	175
N	21~22	Aluminum-wrought alloy	Vc	145	160	150	150	155	175	185	195	195
			fz	0.025	0.032	0.045	0.057	0.075	0.085	0.1	0.134	0.175
			RPM	15385	12732	9549	7958	6167	5570	4907	3879	3104
			FEED	769	815	859	907	925	947	981	1040	1086
	23~25	Aluminum-cast, alloyed	Vc	145	160	150	150	155	175	185	195	195
			fz	0.025	0.032	0.045	0.057	0.075	0.085	0.1	0.134	0.175
			RPM	15385	12732	9549	7958	6167	5570	4907	3879	3104
			FEED	769	815	859	907	925	947	981	1040	1086

※ The FEED, in long & extra long types, should be reduced by around 50%



K-2 END MILLS

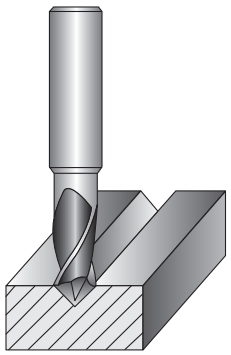
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

G9400 SERIES — **2 FLUTE DRILL MILLS - V-GROOVING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-2	Non-alloy steel	Vc	80	85	85	80	80	90	95	100	95
			fz	0.005	0.006	0.008	0.01	0.014	0.016	0.018	0.023	0.029
			RPM	8488	6764	5411	4244	3183	2865	2520	1989	1512
			FEED	85	81	87	85	89	92	91	92	88
	3-4		Vc	55	60	55	55	55	55	55	65	60
			fz	0.004	0.004	0.006	0.007	0.012	0.014	0.02	0.022	0.028
			RPM	5836	4775	3501	2918	2188	1751	1459	1293	955
			FEED	47	38	42	41	53	49	58	57	53
	5		Vc	45	50	50	50	45	55	55	55	55
			fz	0.004	0.004	0.006	0.008	0.014	0.015	0.018	0.023	0.03
			RPM	4775	3979	3183	2653	1790	1751	1459	1094	875
			FEED	38	32	38	42	50	53	53	50	53
	6	Low alloy steel	Vc	80	85	85	80	80	90	95	100	95
			fz	0.005	0.006	0.008	0.01	0.014	0.016	0.018	0.023	0.029
			RPM	8488	6764	5411	4244	3183	2865	2520	1989	1512
			FEED	85	81	87	85	89	92	91	92	88
	7		Vc	55	60	55	55	55	55	55	65	60
			fz	0.004	0.004	0.006	0.007	0.012	0.014	0.02	0.022	0.028
			RPM	5836	4775	3501	2918	2188	1751	1459	1293	955
			FEED	47	38	42	41	53	49	58	57	53
	8-9		Vc	45	50	50	50	45	55	55	55	55
			fz	0.004	0.004	0.006	0.008	0.014	0.015	0.018	0.023	0.03
			RPM	4775	3979	3183	2653	1790	1751	1459	1094	875
			FEED	38	32	38	42	50	53	53	50	53
	10	High alloyed steel, and tool steel	Vc	80	85	85	80	80	90	95	100	95
			fz	0.005	0.006	0.008	0.01	0.014	0.016	0.018	0.023	0.029
			RPM	8488	6764	5411	4244	3183	2865	2520	1989	1512
			FEED	85	81	87	85	89	92	91	92	88
	11.1		Vc	45	50	50	50	45	55	55	55	55
			fz	0.004	0.004	0.006	0.008	0.014	0.015	0.018	0.023	0.03
			RPM	4775	3979	3183	2653	1790	1751	1459	1094	875
			FEED	38	32	38	42	50	53	53	50	53
M	14.1	Stainless steel	Vc	30	35	40	35	40	45	45	45	40
			fz	0.004	0.005	0.006	0.008	0.01	0.011	0.013	0.019	0.028
			RPM	3183	2785	2546	1857	1592	1432	1194	895	637
			FEED	25	28	31	30	32	32	31	34	36
N	21~22	Aluminum-wrought alloy	Vc	185	210	210	205	205	220	230	230	230
			fz	0.008	0.01	0.013	0.016	0.022	0.026	0.03	0.041	0.052
			RPM	19629	16711	13369	10876	8157	7003	6101	4576	3661
			FEED	314	334	348	348	359	364	366	375	381
	23~25	Aluminum-cast, alloyed	Vc	185	210	210	205	205	220	230	230	230
			fz	0.008	0.01	0.013	0.016	0.022	0.026	0.03	0.041	0.052
			RPM	19629	16711	13369	10876	8157	7003	6101	4576	3661
			FEED	314	334	348	348	359	364	366	375	381
S	36-37	Titanium Alloys	Vc	30	35	40	35	40	45	45	45	40
			fz	0.004	0.005	0.006	0.008	0.01	0.011	0.013	0.019	0.028
			RPM	3183	2785	2546	1857	1592	1432	1194	895	637
			FEED	25	28	31	30	32	32	31	34	36

※ The FEED, in long & extra long types, should be reduced by around 50%



YG

Leading Through Innovation

HSS PM60

ONLY ONE COATED PM60 END MILLS

Only One, beschichtete Pulvermetall PM60 Schafttfräser

- **Perfect Solution of Carbide Chipping under Vibrations**
- **Perfekte Lösung bei Zerspanung unter Vibrationen**

SELECTION GUIDE

YG MILLING TOOLS

COATED PM60
ONLY ONE
END MILLS

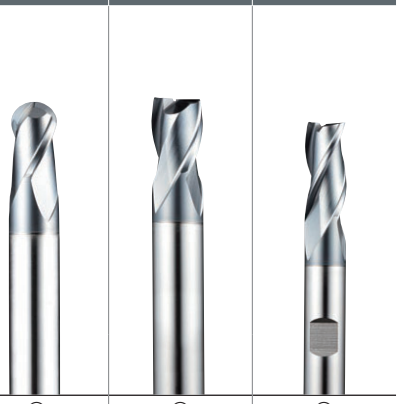
Perfect solution to protect Carbide chipping problems under vibrations

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C644

SERIES	GYG77 GYF97	GYG72 GYF99	GYG01
FLUTE	2	2	3
HELIX ANGLE	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	SQUARE	SQUARE
SIZE MIN	R0.5	D1.0	D1.0
SIZE MAX	R10.0	D25.0	D25.0
PAGE	C634	C635	C636
	SHORT LENGTH	SHORT LENGTH	SHORT LENGTH CENTER CUT
	Y-Coating	Y-Coating	Y-Coating



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎
	11			Quenched & Tempered	325	35	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	◎	◎
	20		Pearlitic		230	21	◎	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42	○	○	○
	41	Hardened Cast Iron		Hardened	550	55			

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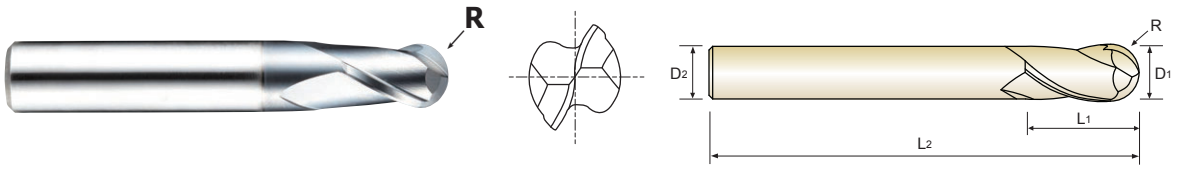
PLAIN SHANK **GYG77 SERIES**
FLAT SHANK **GYF97 SERIES**

PM60, 2 FLUTE BALL NOSE SHORT LENGTH

PM60, 2 SCHNEIDEN, STIRNRADIUS KURZ
REVÊTUE YG-ALCRN - PM60, 2 DENTS, SÉRIE COURTE, HÉMISPHÉRIQUE
RIVESTITA PM60, 2 TAGLIENTE SERIE CORTA SEMISFERICA



PM 60 | 2 | 30° | R ±0.02 | PLAIN | FLAT | Y Coating

p.C644

Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R(±0.02)	D_1	D_2	L_1	L_2
GYG77010	GYF97010	R0.5	1.0	6	2.5	47
GYG77020	GYF97020	R1.0	2.0	6	4	48
GYG77030	GYF97030	R1.5	3.0	6	5	49
-	GYF97040	R2.0	4.0	6	7	51
-	GYF97050	R2.5	5.0	6	8	52
GYG77060	GYF97060	R3.0	6.0	6	8	52
-	GYF97070	R3.5	7.0	8	10	60
GYG77080	GYF97080	R4.0	8.0	8	11	61
GYG77090	GYF97090	R4.5	9.0	10	11	61
-	GYF97100	R5.0	10.0	10	13	63
GYG77120	GYF97120	R6.0	12.0	12	16	73
-	GYF97140	R7.0	14.0	12	16	73
GYG77160	GYF97160	R8.0	16.0	16	19	79
-	GYF97200	R10.0	20.0	20	22	88

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	

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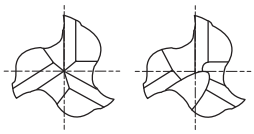
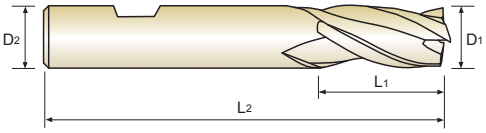
FLAT SHANK **GYG01 SERIES**

PM60, 3 FLUTE SHORT LENGTH (Center Cut)

- PM60, 3 SCHNEIDEN, KURZ, ZENTRUMSCHNITT
- REVÊTUE YG-ALCRN - PM60, 3 DENTS, SÉRIE COURTE (COUPE AU CENTRE)
- RIVESTITA PM60, 3 TAGLIENTI SERIE CORTA (TAGLIENTE AL CENTRO)





PM 60 | 3 | 30° | FLAT | Y Coating

p.C646~C647

Unit : mm

EDP No.	Mill Diameter D_1	Shank Diameter D_2	Length of Cut L_1	Overall Length L_2
GYG01010	1.0	6	3	47
GYG01020	2.0	6	7	51
GYG01030	3.0	6	8	52
GYG01040	4.0	6	11	55
GYG01050	5.0	6	13	57
GYG01060	6.0	6	13	57
GYG01070	7.0	8	16	66
GYG01080	8.0	8	19	69
GYG01090	9.0	10	19	69
GYG01100	10.0	10	22	72
GYG01120	12.0	12	26	83
GYG01140	14.0	12	26	83
GYG01160	16.0	16	32	92
GYG01180	18.0	16	32	92
GYG01200	20.0	20	38	104
GYG01220	22.0	20	38	104
GYG01250	25.0	25	45	121

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	

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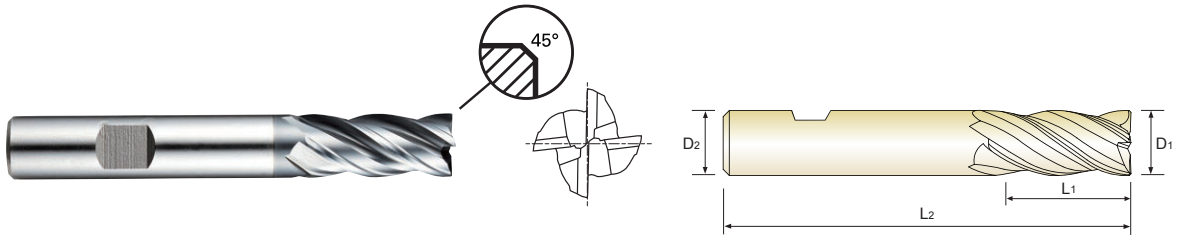
ONLY ONE COATED PM60 END MILLS

FLAT SHANK **GYG52 SERIES**

PM60, 4 FLUTE MULTIPLE HELIX SHORT LENGTH (Center Cut)

PM60, 4 SCHNEIDEN, MIT UNGLEICHEM DRALL, KURZ, ZENTRUMSCHNITT
REVÊTUE YG-ALCRN - PM60, 4 DENTS, HÉLICE MULTIPLE, SÉRIE COURTE (COUPE AU CENTRE)
RIVESTITA PM60, 4 TAGLIENTI ELICA VARIABILE SERIE CORTA (TAGLIENTE AL CENTRO)

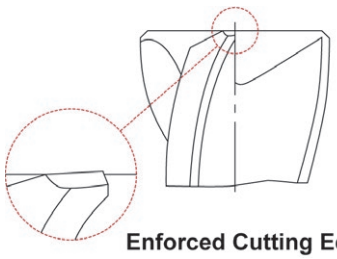


PM 60 | 4 | 35°/37° | FLAT | C x 45° | Y Coating p.C649

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Chamfer
GYG52030	3.0	6	8	52	0.1
GYG52040	4.0	6	11	55	0.1
GYG52050	5.0	6	13	57	0.1
GYG52060	6.0	6	13	57	0.1
GYG52070	7.0	8	16	66	0.1
GYG52080	8.0	8	19	69	0.1
GYG52100	10.0	10	22	72	0.1
GYG52120	12.0	12	26	83	0.1
GYG52140	14.0	12	26	83	0.2
GYG52160	16.0	16	32	92	0.2
GYG52180	18.0	16	32	92	0.2
GYG52200	20.0	20	38	104	0.2
GYG52220	22.0	20	38	104	0.2
GYG52250	25.0	25	45	121	0.2

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h6



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	

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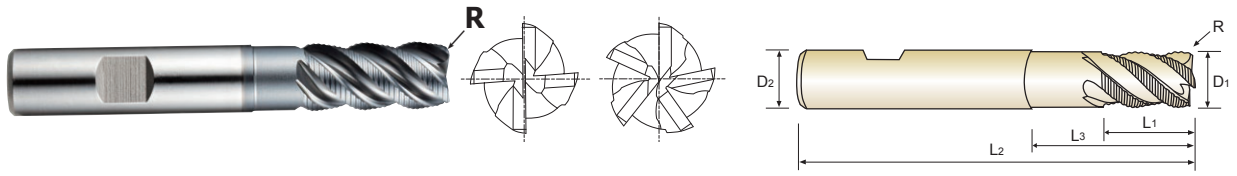
FLAT SHANK **GYF95 SERIES**

PM60, MULTI FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS ROUGHING - FINE (Center Cut)

PM60, MEHRSCHNEIDEN, MIT UNGLEICHEM DRALL, KURZ, ECKENRADIUS, FEINKORDEL-SCHRUPPFRÄSER, ZENTRUMSCHNITT
REVÊTUE YG-ALCRN - PM60, MULTI-DENTS, HÉLICE MULTIPLE, SÉRIE COURTE, RAYONNÉE, RAVAGEUSE, PAS FINS (COUPE AU CENTRE)
RIVESTITA PM60, MULTI TAGLIENTE ELICA VARIABILE SERIE CORTA TORICA PER SGROSSATURA - BOMBATO FINE (TAGLIENTE AL CENTRO)



PM 60 | 4-5 | 44°/44.5°/45° | HR | FLAT | Y Coating

p.C650

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank iameter	Length of Cut	Length Below Shank	Overall engtth	No. of Flute
	R	D1(js12)	D2(h6)	L1	L3	L2	
GYF95060	R0.5	**6.0**	6	13	-	57	4
GYF95070	R0.5	**7.0**	10	16	-	66	4
GYF95080	R0.5	**8.0**	10	19	-	69	4
GYF95090	R0.5	**9.0**	10	19	-	69	4
GYF95100	R0.5	**10.0**	10	22	31	72	4
GYF95120	R0.5	**12.0**	12	26	37	83	4
GYF95140	R1.0	**14.0**	12	26	-	83	5
GYF95160	R1.0	**16.0**	16	32	44	92	5
GYF95180	R1.0	**18.0**	16	32	-	92	5
GYF95200	R1.0	**20.0**	20	38	54	104	5
GYF95250	R1.0	**25.0**	25	45	63	121	5

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛			
Nominal-Diameter in ㎜			
	over 6 to 10	over 10 to 18	over 18 to 30
js12	±75	±90	±105
h6	0 - 9	0 - 11	0 - 13

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	

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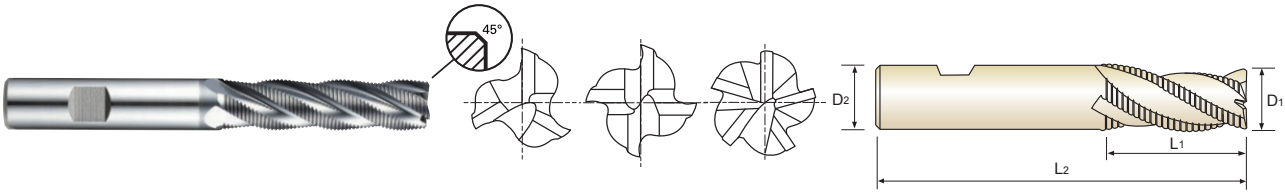
ONLY ONE COATED PM60 END MILLS

FLAT SHANK **GYF98 SERIES**

PM60, MULTI FLUTE LONG LENGTH ROUGHING - FINE (Center Cut)

- PM60, MEHRSCHNEIDEN, LANG, FEINKORDEL-SCHRUPPFRÄSER, ZENTRUMSCHNITT
- REVÊTUE YG-ALCRN - PM60, MULTI-DENTS, SÉRIE LONGUE, RAVAGEUSE, PAS FINS (COUPE AU CENTRE)
- RIVESTITA PM60, MULTI TAGLIENTE SERIE LUNGA PER SGROSSATURA - BOMBATO FINE (TAGLIENTE AL CENTRO)



PM 60 | 3-5 | 30° | HR | FLAT | C x 45° | Y Coating

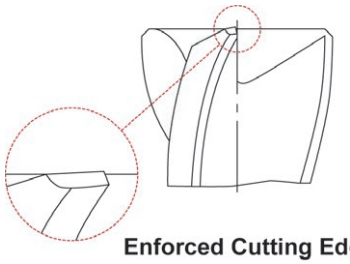
p.C651

Unit : mm

EDP No.	Mill Diameter D1(js12)	Shank Diameter D2(h6)	Length of Cut L1	Overall Length L2	No. of Flute	Chamfer
GYF98060	6.0	6	24	68	3	0.18
GYF98070	7.0	10	30	80	3	0.18
GYF98080	8.0	10	38	88	3	0.18
GYF98090	9.0	10	38	88	3	0.18
GYF98100	10.0	10	45	95	4	0.18
GYF98120	12.0	12	53	110	4	0.18
GYF98140	14.0	12	53	110	4	0.25
GYF98160	16.0	16	63	123	4	0.25
GYF98180	18.0	16	63	123	4	0.25
GYF98200	20.0	20	75	141	4	0.25
GYF98250	25.0	25	90	166	5	0.36

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛			
Nominal-Diameter in ㎜			
	over 6 to 10	over 10 to 18	over 18 to 30
js12	±75	±90	±105
h6	0 / - 9	0 / - 11	0 / - 13



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○												○	

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

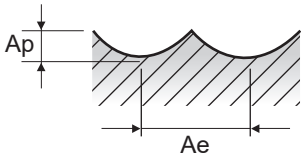
ONLY ONE COATED PM60 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GYG77 , GYF97 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1	Non-alloy steel	0.5D	0.2D	Vc	83	90	100	101	104	104	103	102	90
					fz	0.023	0.036	0.054	0.079	0.109	0.115	0.141	0.156	0.162
					RPM	8807	7162	5305	4019	3310	2759	2049	1623	1146
					FEED	405	516	573	635	722	634	578	506	371
	2		0.5D	0.2D	Vc	66	70	79	78	79	81	78	75	70
					fz	0.020	0.032	0.046	0.067	0.095	0.097	0.123	0.140	0.140
					RPM	7003	5570	4191	3104	2515	2149	1552	1194	891
					FEED	280	357	386	416	478	417	382	334	250
	3-4		0.5D	0.2D	Vc	44	45	52	54	53	54	54	52	44
					fz	0.016	0.026	0.039	0.056	0.082	0.083	0.1	0.11	0.125
					RPM	4669	3581	2759	2149	1687	1432	1074	828	560
					FEED	149	186	215	241	277	238	215	182	140
	5		0.5D	0.2D	Vc	23	24	27	27	26	26	27	27	24
					fz	0.014	0.023	0.035	0.047	0.073	0.071	0.090	0.099	0.100
					RPM	2440	1910	1432	1074	828	690	537	430	306
					FEED	68	88	100	101	121	98	97	85	61
	6	Low alloy steel	0.5D	0.2D	Vc	66	70	79	78	79	81	78	75	70
					fz	0.020	0.032	0.046	0.067	0.095	0.097	0.123	0.140	0.140
					RPM	7003	5570	4191	3104	2515	2149	1552	1194	891
					FEED	280	357	386	416	478	417	382	334	250
	7		0.5D	0.2D	Vc	44	45	52	54	53	54	54	52	44
					fz	0.016	0.026	0.039	0.056	0.082	0.083	0.1	0.11	0.125
					RPM	4669	3581	2759	2149	1687	1432	1074	828	560
					FEED	149	186	215	241	277	238	215	182	140
	8-9		0.5D	0.2D	Vc	23	24	27	27	26	26	27	27	24
					fz	0.014	0.023	0.035	0.047	0.073	0.071	0.090	0.099	0.100
					RPM	2440	1910	1432	1074	828	690	537	430	306
					FEED	68	88	100	101	121	98	97	85	61
	10	High alloyed steel, and tool steel	0.5D	0.2D	Vc	66	70	79	78	79	81	78	75	70
					fz	0.020	0.032	0.046	0.067	0.095	0.097	0.123	0.140	0.140
					RPM	7003	5570	4191	3104	2515	2149	1552	1194	891
					FEED	280	357	386	416	478	417	382	334	250
	11.1		0.5D	0.2D	Vc	23	24	27	27	26	26	27	27	24
					fz	0.014	0.023	0.035	0.047	0.073	0.071	0.090	0.099	0.100
					RPM	2440	1910	1432	1074	828	690	537	430	306
					FEED	68	88	100	101	121	98	97	85	61
	11.2		0.3D	0.2D	Vc	16	17	19	19	18	18	19	19	16
					fz	0.013	0.024	0.035	0.047	0.075	0.071	0.088	0.1	0.095
					RPM	1698	1353	1008	756	573	477	378	302	204
					FEED	44	65	71	71	86	68	67	60	39
M	14.1	Stainless steel	0.5D	0.2D	Vc	25	27	30	30	28	29	30	30	26
					fz	0.013	0.023	0.036	0.049	0.072	0.075	0.093	0.099	0.098
					RPM	2653	2149	1592	1194	891	769	597	477	331
					FEED	69	99	115	117	128	115	111	95	65
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	0.2D	Vc	66	70	79	78	79	81	78	75	70
					fz	0.02	0.032	0.046	0.067	0.095	0.097	0.123	0.14	0.14
					RPM	7003	5570	4191	3104	2515	2149	1552	1194	891
					FEED	280	357	386	416	478	417	382	334	250
H	40	Chilled Cast Iron	0.3D	0.2D	Vc	16	17	19	19	18	18	19	19	16
					fz	0.013	0.024	0.035	0.047	0.075	0.071	0.088	0.1	0.095
					RPM	1698	1353	1008	756	573	477	378	302	204
					FEED	44	65	71	71	86	68	67	60	39



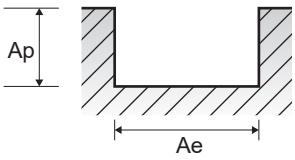
ONLY ONE COATED PM60 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GYG01 SERIES — 3 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	49	52	65	72	76	78	79	81	84	81	78	72	70	71
					fz	0.004	0.007	0.011	0.014	0.023	0.031	0.04	0.051	0.052	0.06	0.07	0.08	0.091	0.107
					RPM	7799	5517	5173	4584	4032	3104	2515	2149	1910	1611	1379	1146	1013	904
					FEED	94	116	171	193	278	289	302	329	298	290	290	275	276	290
	2		1.0D	0.5D	Vc	41	44	54	60	63	66	68	66	71	69	61	60	61	60
					fz	0.003	0.007	0.011	0.013	0.023	0.032	0.039	0.053	0.055	0.06	0.072	0.081	0.089	0.11
					RPM	6525	4669	4297	3820	3342	2626	2165	1751	1614	1373	1079	955	883	764
					FEED	59	98	142	149	231	252	253	278	266	247	233	232	236	252
	3-4		1.0D	0.5D	Vc	36	38	45	49	52	54	53	54	53	54	54	53	50	46
					fz	0.003	0.005	0.009	0.012	0.021	0.028	0.038	0.047	0.053	0.056	0.063	0.067	0.083	0.107
					RPM	5730	4032	3581	3119	2759	2149	1687	1432	1205	1074	955	844	723	586
					FEED	52	60	97	112	174	180	192	202	192	180	180	170	180	188
	5		1.0D	0.5D	Vc	23	25	29	32	33	35	34	34	35	34	34	33	33	34
					fz	0.004	0.007	0.009	0.012	0.021	0.029	0.044	0.052	0.055	0.06	0.064	0.069	0.08	0.093
					RPM	3661	2653	2308	2037	1751	1393	1082	902	796	676	601	525	477	433
					FEED	44	56	62	73	110	121	143	141	131	122	115	109	115	121
	6	Low alloy steel	1.0D	0.5D	Vc	41	44	54	60	63	66	68	66	71	69	61	60	61	60
					fz	0.003	0.007	0.011	0.013	0.023	0.032	0.039	0.053	0.055	0.06	0.072	0.081	0.089	0.11
					RPM	6525	4669	4297	3820	3342	2626	2165	1751	1614	1373	1079	955	883	764
					FEED	59	98	142	149	231	252	253	278	266	247	233	232	236	252
	7		1.0D	0.5D	Vc	36	38	45	49	52	54	53	54	53	54	54	53	50	46
					fz	0.003	0.005	0.009	0.012	0.021	0.028	0.038	0.047	0.053	0.056	0.063	0.067	0.083	0.107
					RPM	5730	4032	3581	3119	2759	2149	1687	1432	1205	1074	955	844	723	586
					FEED	52	60	97	112	174	180	192	202	192	180	180	170	180	188
	8		1.0D	0.5D	Vc	23	25	29	32	33	35	34	34	35	34	34	33	33	34
					fz	0.004	0.007	0.009	0.012	0.021	0.029	0.044	0.052	0.055	0.06	0.064	0.069	0.08	0.093
					RPM	3661	2653	2308	2037	1751	1393	1082	902	796	676	601	525	477	433
					FEED	44	56	62	73	110	121	143	141	131	122	115	109	115	121
	9		1.0D	0.3D	Vc	14	20	23	25	25	27	26	26	26	27	27	27	26	24
					fz	0.005	0.008	0.012	0.014	0.023	0.031	0.045	0.052	0.056	0.063	0.066	0.074	0.088	0.111
					RPM	2228	2122	1830	1592	1326	1074	828	690	591	537	477	430	376	306
					FEED	33	51	66	67	92	100	112	108	99	102	95	95	99	102
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	41	44	54	60	63	66	68	66	71	69	61	60	61	60
					fz	0.003	0.007	0.011	0.013	0.023	0.032	0.039	0.053	0.055	0.06	0.072	0.081	0.089	0.11
					RPM	6525	4669	4297	3820	3342	2626	2165	1751	1614	1373	1079	955	883	764
					FEED	59	98	142	149	231	252	253	278	266	247	233	232	236	252
	11.1		1.0D	0.5D	Vc	23	25	29	32	33	35	34	34	35	34	34	33	33	34
					fz	0.004	0.007	0.009	0.012	0.021	0.029	0.044	0.052	0.055	0.06	0.064	0.069	0.08	0.093
					RPM	3661	2653	2308	2037	1751	1393	1082	902	796	676	601	525	477	433
					FEED	44	56	62	73	110	121	143	141	131	122	115	109	115	121
	11.2		1.0D	0.3D	Vc	10	14	16	17	17	19	18	18	18	19	19	19	19	16
					fz	0.005	0.009	0.012	0.014	0.024	0.031	0.044	0.051	0.056	0.063	0.064	0.072	0.086	0.111
					RPM	1592	1485	1273	1082	902	756	573	477	409	378	336	302	275	204
					FEED	24	40	46	45	65	70	76	73	69	71	65	65	71	68
M	14.1	Stainless steel	1.0D	0.5D	Vc	41	44	54	60	63	66	68	66	71	69	61	60	61	60
					fz	0.003	0.007	0.011	0.013	0.023	0.032	0.039	0.053	0.055	0.06	0.072	0.081	0.089	0.11
					RPM	6525	4669	4297	3820	3342	2626	2165	1751	1614	1373	1079	955	883	764
					FEED	59	98	142	149	231	252	253	278	266	247	233	232	236	252
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	Vc	41	44	54	60	63	66	68	66	71	69	61	60	61	60
					fz	0.003	0.007	0.011	0.013	0.023	0.032	0.039	0.053	0.055	0.06	0.072	0.081	0.089	0.11
					RPM	6525	4669	4297	3820	3342	2626	2165	1751	1614	1373	1079	955	883	764
					FEED	59	98	142	149	231	252	253	278	266	247	233	232	236	252
H	40	Chilled Cast Iron	1.0D	0.3D	Vc	10	14	16	17	17	19	18	18	18	19	19	19	19	16
					fz	0.005	0.009	0.012	0.014	0.024	0.031	0.044	0.051	0.056	0.063	0.064	0.072	0.086	0.111
					RPM	1592	1485	1273	1082	902	756	573	477	409	378	336	302	275	204
					FEED	24	40	46	45	65	70	76	73	69	71	65	65	71	68



ONLY ONE COATED PM60 END MILLS

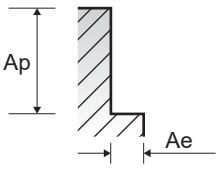
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GYG74 , GYF96 , GYG76 , GYG02 SERIES

4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	69	75	80	83	88	93	87	90	95	97	102	94	87	94
					fz	0.008	0.015	0.023	0.029	0.035	0.046	0.068	0.071	0.076	0.079	0.076	0.088	0.097	0.093
					RPM	10982	7958	6366	5284	4669	3700	2769	2387	2160	1930	1804	1496	1259	1197
					FEED	351	477	586	613	654	681	753	678	657	610	548	527	488	445
	2		0.1D	1.5D	Vc	63	68	71	75	81	78	79	81	84	84	85	79	79	79
					fz	0.007	0.015	0.021	0.026	0.031	0.046	0.063	0.067	0.072	0.077	0.08	0.088	0.084	0.09
					RPM	10027	7215	5650	4775	4297	3104	2515	2149	1910	1671	1503	1257	1143	1006
					FEED	281	433	475	497	533	571	634	576	550	515	481	443	384	362
	3-4		0.1D	1.5D	Vc	46	50	54	55	59	60	60	63	58	60	61	59	57	60
					fz	0.007	0.014	0.021	0.028	0.032	0.046	0.059	0.066	0.08	0.085	0.086	0.088	0.093	0.09
					RPM	7321	5305	4297	3501	3130	2387	1910	1671	1319	1194	1079	939	825	764
					FEED	205	297	361	392	401	439	451	441	422	406	371	331	307	275
	5		0.1D	1.5D	Vc	31	31	35	38	41	42	38	40	42	41	43	40	39	39
					fz	0.008	0.017	0.022	0.028	0.032	0.043	0.067	0.068	0.072	0.081	0.077	0.082	0.085	0.09
					RPM	4934	3289	2785	2419	2175	1671	1210	1061	955	816	760	637	564	497
					FEED	158	224	245	271	278	287	324	289	275	264	234	209	192	179
	6	Low alloy steel	0.1D	1.5D	Vc	63	68	71	75	81	78	79	81	84	84	85	79	79	79
					fz	0.007	0.015	0.021	0.026	0.031	0.046	0.063	0.067	0.072	0.077	0.08	0.088	0.084	0.09
					RPM	10027	7215	5650	4775	4297	3104	2515	2149	1910	1671	1503	1257	1143	1006
					FEED	281	433	475	497	533	571	634	576	550	515	481	443	384	362
	7		0.1D	1.5D	Vc	46	50	54	55	59	60	60	63	58	60	61	59	57	60
					fz	0.007	0.014	0.021	0.028	0.032	0.046	0.059	0.066	0.08	0.085	0.086	0.088	0.093	0.09
					RPM	7321	5305	4297	3501	3130	2387	1910	1671	1319	1194	1079	939	825	764
					FEED	205	297	361	392	401	439	451	441	422	406	371	331	307	275
	8		0.1D	1.5D	Vc	31	31	35	38	41	42	38	40	42	41	43	40	39	39
					fz	0.008	0.017	0.022	0.028	0.032	0.043	0.067	0.068	0.072	0.081	0.077	0.082	0.085	0.09
					RPM	4934	3289	2785	2419	2175	1671	1210	1061	955	816	760	637	564	497
					FEED	158	224	245	271	278	287	324	289	275	264	234	209	192	179
	9		0.05D	1.5D	Vc	25	27	30	32	33	35	34	32	33	33	34	33	33	34
					fz	0.006	0.013	0.019	0.023	0.031	0.04	0.056	0.064	0.067	0.076	0.075	0.08	0.081	0.087
					RPM	3979	2865	2387	2037	1751	1393	1082	849	750	657	601	525	477	433
					FEED	95	149	181	187	217	223	242	217	201	200	180	168	155	151
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	63	68	71	75	81	78	79	81	84	84	85	79	79	79
					fz	0.007	0.015	0.021	0.026	0.031	0.046	0.063	0.067	0.072	0.077	0.08	0.088	0.084	0.09
					RPM	10027	7215	5650	4775	4297	3104	2515	2149	1910	1671	1503	1257	1143	1006
					FEED	281	433	475	497	533	571	634	576	550	515	481	443	384	362
	11.1		0.1D	1.5D	Vc	31	31	35	38	41	42	38	40	42	41	43	40	39	39
					fz	0.008	0.017	0.022	0.028	0.032	0.043	0.067	0.068	0.072	0.081	0.077	0.082	0.085	0.09
					RPM	4934	3289	2785	2419	2175	1671	1210	1061	955	816	760	637	564	497
					FEED	158	224	245	271	278	287	324	289	275	264	234	209	192	179
	11.2		0.05D	1.5D	Vc	17	19	21	22	23	24	24	23	23	23	24	23	23	24
					fz	0.006	0.013	0.019	0.024	0.031	0.04	0.057	0.065	0.068	0.076	0.074	0.081	0.081	0.088
					RPM	2706	2016	1671	1401	1220	955	764	610	523	458	424	366	333	306
					FEED	65	105	127	134	151	153	174	159	142	139	126	119	108	108
M	14.1	Stainless steel	0.1D	1.5D	Vc	27	30	33	35	36	38	37	36	37	37	37	36	37	37
					fz	0.006	0.013	0.019	0.023	0.031	0.039	0.056	0.063	0.067	0.075	0.076	0.08	0.08	0.088
					RPM	4297	3183	2626	2228	1910	1512	1178	955	841	736	654	573	535	471
					FEED	103	166	200	205	237	236	264	241	225	221	199	183	171	166
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	63	68	71	75	81	78	79	81	84	84	85	79	79	79
					fz	0.007	0.015	0.021	0.026	0.031	0.046	0.063	0.067	0.072	0.077	0.08	0.088	0.084	0.09
					RPM	10027	7215	5650	4775	4297	3104	2515	2149	1910	1671	1503	1257	1143	1006
					FEED	281	433	475	497	533	571	634	576	550	515	481	443	384	362
H	40	Chilled Cast Iron	0.05D	1.5D	Vc	17	19	21	22	23	24	24	23	23	23	24	23	23	24
					fz	0.006	0.013	0.019	0.024	0.031	0.04	0.057	0.065	0.068	0.076	0.074	0.081	0.081	0.088
					RPM	2706	2016	1671	1401	1220	955	764	610	523	458	424	366	333	306
					FEED	65	105	127	134	151	153	174	159	142	139	126	119	108	108



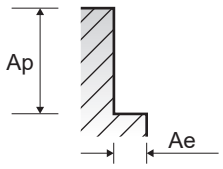
ONLY ONE COATED PM60 END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GYF95 SERIES — MULTI FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	76	87	86	87	89	87	85	87	90
					fz	0.02	0.03	0.055	0.065	0.059	0.069	0.079	0.088	0.105
					RPM	4032	3462	2737	2308	2024	1731	1503	1385	1146
					FEED	323	415	602	600	597	597	594	609	602
	2		0.5D	1.5D	Vc	60	69	68	65	66	69	72	68	68
					fz	0.021	0.03	0.053	0.069	0.063	0.069	0.074	0.087	0.106
					RPM	3183	2745	2165	1724	1501	1373	1273	1082	866
					FEED	267	329	459	476	473	474	471	471	459
	3		0.5D	1.5D	Vc	43	51	47	49	48	48	50	48	47
					fz	0.018	0.028	0.046	0.063	0.061	0.069	0.075	0.086	0.107
					RPM	2281	2029	1496	1300	1091	955	884	764	598
					FEED	164	227	275	328	333	329	332	328	320
	4		0.5D	1.5D	Vc	43	51	47	49	48	48	50	48	47
					fz	0.018	0.028	0.046	0.063	0.061	0.069	0.075	0.086	0.107
					RPM	2281	2029	1496	1300	1091	955	884	764	598
					FEED	164	227	275	328	266	264	265	263	256
	5		0.5D	1.5D	Vc	35	38	40	40	40	40	40	40	41
					fz	0.02	0.03	0.045	0.061	0.057	0.066	0.073	0.081	0.1
					RPM	1857	1512	1273	1061	909	796	707	637	522
					FEED	149	181	229	259	259	263	258	258	261
	6	Low alloy steel	0.5D	1.5D	Vc	60	69	68	65	66	69	72	68	68
					fz	0.021	0.03	0.053	0.069	0.063	0.069	0.074	0.087	0.106
					RPM	3183	2745	2165	1724	1501	1373	1273	1082	866
					FEED	267	329	459	476	473	474	471	471	459
	7		0.5D	1.5D	Vc	43	51	47	49	48	48	50	48	47
					fz	0.018	0.028	0.046	0.063	0.061	0.069	0.075	0.086	0.107
					RPM	2281	2029	1496	1300	1091	955	884	764	598
					FEED	164	227	275	328	333	329	332	328	320
	8-9		0.5D	1.5D	Vc	35	38	40	40	40	40	40	40	41
					fz	0.02	0.03	0.045	0.061	0.057	0.066	0.073	0.081	0.1
					RPM	1857	1512	1273	1061	909	796	707	637	522
					FEED	149	181	229	259	259	263	258	258	261
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	60	69	68	65	66	69	72	68	68
					fz	0.021	0.03	0.053	0.069	0.063	0.069	0.074	0.087	0.106
					RPM	3183	2745	2165	1724	1501	1373	1273	1082	866
					FEED	267	329	459	476	473	474	471	471	459
	11.1		0.5D	1.5D	Vc	35	38	40	40	40	40	40	40	41
					fz	0.02	0.03	0.045	0.061	0.057	0.066	0.073	0.081	0.1
					RPM	1857	1512	1273	1061	909	796	707	637	522
					FEED	149	181	229	259	259	263	258	258	261
	11.2		0.3D	1.5D	Vc	25	27	28	28	28	28	28	28	28
					fz	0.02	0.029	0.044	0.06	0.056	0.065	0.072	0.08	0.1
					RPM	1326	1074	891	743	637	557	495	446	357
					FEED	106	125	157	178	178	181	178	178	178
M	14.1	Stainless steel	0.5D	1.5D	Vc	39	43	43	43	44	43	45	44	44
					fz	0.019	0.03	0.045	0.064	0.059	0.069	0.075	0.084	0.104
					RPM	2069	1711	1369	1141	1000	855	796	700	560
					FEED	157	205	246	292	295	295	298	294	291
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	Vc	60	69	68	65	66	69	72	68	68
					fz	0.021	0.03	0.053	0.069	0.063	0.069	0.074	0.087	0.106
					RPM	3183	2745	2165	1724	1501	1373	1273	1082	866
					FEED	267	329	459	476	473	474	471	471	459
H	40	Chilled Cast Iron	0.3D	1.5D	Vc	25	27	28	28	28	28	28	28	28
					fz	0.02	0.029	0.044	0.06	0.056	0.065	0.072	0.08	0.1
					RPM	1326	1074	891	743	637	557	495	446	357
					FEED	106	125	157	178	178	181	178	178	178



Global Cutting Tool Leader **YG-1**

MILLING

YG

Leading Through Innovation

HSS-PM

TANK-POWER END MILLS

TANK - POWER HSS-PM - Fräser

- High Toughness for Stainless Steels, Carbon steels and Alloy Steels
- Hohe Zähigkeit, für rostfreie Stähle, Kohlenstoffstähle und legierte Stähle

SELECTION GUIDE

YG MILLING TOOLS

HSS-PM
TANK-POWER END MILLS

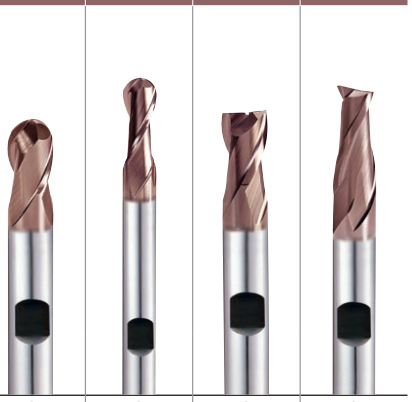
High Toughness, for Stainless Steels, Carbon steels, Alloy Steels
For General Application, Rough & Finish

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p. C670

SERIES	E9940 GA940	E9A32 GAA32	E9936 GA936	E9A29 GAA29
FLUTE	2	2	2	2
HELIX ANGLE	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	SQUARE	SQUARE
SIZE MIN	R0.5	R1.0	D1.0	D2.0
SIZE MAX	R12.5	R12.5	D25.0	D22.0
PAGE	C656	C657	C658	C659
	SHORT LENGTH	LONG LENGTH	SHORT LENGTH	LONG LENGTH
	TiAlN	TiAlN	TiAlN	TiAlN



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	○	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	○	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	◎	◎	◎
	20		Pearlitic		230	21	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

TANK-POWER END MILLS

UNCOATED **E9940** SERIES
TiAlN COATED **GA940** SERIES

HSS-PM, 2 FLUTE SHORT LENGTH BALL NOSE

HSS-PM, 2 SCHNEIDEN KURZ STIRNRADIUS
FRAISES HSS-PM, 2 DENTS À BOUT HÉMISPHÉRIQUE, SÉRIE COURTE
2 TAGLIENTI, SERIE CORTA, HSS-PM, SEMISFERICA

- Designed to machine carbon steels, alloyed steels, stainless steels.
- Designed for milling of radius bottom slots, fillets and special contours.
- YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- Entworfen zum Fräsen von Nuten mit Radien, Rippen und speziellen Konturen.
- Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.

p.C670~C671

Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	R(±0.02)				
E9940010	**GA940010**	R0.5	**1.0**	6	2.5	47
-	**GA940020**	R1.0	**2.0**	6	4	48
E9940030	**GA940030**	R1.5	**3.0**	6	5	49
-	**GA940040**	R2.0	**4.0**	6	7	51
-	**GA940050**	R2.5	**5.0**	6	8	52
-	**GA940070**	R3.5	**7.0**	10	10	60
-	**GA940080**	R4.0	**8.0**	10	11	61
E9940090	**GA940090**	R4.5	**9.0**	10	11	61
E9940100	**GA940100**	R5.0	**10.0**	10	13	63
E9940120	**GA940120**	R6.0	**12.0**	12	16	73
E9940140	**GA940140**	R7.0	**14.0**	12	16	73
-	**GA940160**	R8.0	**16.0**	16	19	79
E9940180	**GA940180**	R9.0	**18.0**	16	19	79
-	**GA940200**	R10.0	**20.0**	20	22	88
-	**GA940220**	R11.0	**22.0**	20	22	88
E9940250	**GA940250**	R12.5	**25.0**	25	26	102

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

TANK-POWER END MILLS

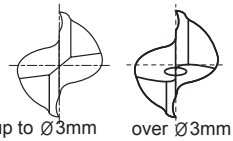
UNCOATED **E9936** SERIES
TiAlN COATED **GA936** SERIES

HSS-PM, 2 FLUTE SHORT LENGTH

HSS-PM, 2 SCHNEIDEN KURZ
FRAISES HSS-PM, 2 DENTS, SÉRIE COURTE
2 TAGLIENTI, SERIE CORTA, HSS-PM

- Designed to machine carbon steels, alloyed steels, stainless steels.
- 2 Flute design for slotting.
- Suitable for high speed cutting of difficult-to-cut materials.
- YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- 2 Schneiden, Geeignet für Nutenfräsen.
- Geeignet für Hochgeschwindigkeitsfräsen von schwer zu zerspanenden Materialien.
- Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



HSS PM | DIN 327 | 2 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C672~C673

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
-	GA936010	1.0	6	2.5	47
-	GA936020	2.0	6	4	48
-	GA936030	3.0	6	5	49
-	GA936040	4.0	6	7	51
E9936050	GA936050	5.0	6	8	52
E9936060	GA936060	6.0	6	8	52
-	GA936070	7.0	10	10	60
E9936080	GA936080	8.0	10	11	61
-	GA936090	9.0	10	11	61
-	GA936100	10.0	10	13	63
E9936120	GA936120	12.0	12	16	73
-	GA936140	14.0	12	16	73
E9936160	GA936160	16.0	16	19	79
E9936180	GA936180	18.0	16	19	79
-	GA936200	20.0	20	22	88
-	GA936220	22.0	20	22	88
-	GA936250	25.0	25	26	102

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛					
Nominal-Diameter in ㎜					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions
YG-1 CO., LTD.

TANK-POWER END MILLS

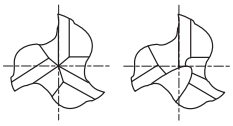
UNCOATED **E9942** SERIES
TiAlN COATED **GA942** SERIES

HSS-PM, 3 FLUTE STUB LENGTH

HSS-PM, 3 SCHNEIDEN EXTRA KURZ
FRAISES HSS-PM, 3 DENTS, SÉRIE EXTRA-COURTE
3 TAGLIENTI, SERIE EXTRA CORTA, HSS-PM

- Designed to machine carbon steels, alloyed steels, stainless steels.
- Well balanced web design to minimize deflection and chattering.
- 3 flute design possess the advantage of 2 flute and 4 flute end mill.
- YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- Verstärkter Kern zur Erhöhung der Stabilität.
- 3 Schneiden Design besitzt die Vorteile von 2-bzw 4 Schneiden Fräsern.
- Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



up to Ø1mm over Ø1mm

HSS PM | DIN 327 | 3 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C674~C677

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
E9942020	GA942020	2.0	6	4	48
-	GA942030	3.0	6	5	49
-	GA942040	4.0	6	7	51
E9942050	GA942050	5.0	6	8	52
-	GA942060	6.0	6	8	52
-	GA942080	8.0	10	11	61
-	GA942090	9.0	10	11	61
-	GA942100	10.0	10	13	63
E9942120	-	12.0	12	16	73
-	GA942140	14.0	12	16	73
-	GA942160	16.0	16	19	79
E9942180	GA942180	18.0	16	19	79
-	GA942200	20.0	20	22	88
-	GA942220	22.0	20	22	88
E9942250	GA942250	25.0	25	26	102

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛					
Nominal-Diameter in ㎜					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

TANK-POWER END MILLS

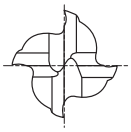
UNCOATED **E9938** SERIES
TiAlN COATED **GA938** SERIES

HSS-PM, 4 FLUTE SHORT LENGTH

HSS-PM, 4 SCHNEIDEN KURZ
FRAISES HSS-PM, 4 DENTS, SÉRIE COURTE
4 TAGLIENTI, SERIE CORTA, HSS-PM

- Designed to machine carbon steels, alloyed steels, stainless steels.
- Recommended for pocketing, cam milling, die sinking and slotting.
- Designed for high speed cutting of difficult-to-cut materials.
- YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- Empfohlen für Taschenfräsen, Nockenfräsen, Gussformen und Nutenfräsen.
- Geeignet für Hochgeschwindigkeitsfräsen von schwer zu zerspanenden Materialien.
- Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



HSS PM | DIN 844 | 4 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C678~C679

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN				
-	GA938010	1.0	6	3	49
-	GA938020	2.0	6	7	51
-	GA938030	3.0	6	8	52
E9938040	GA938040	4.0	6	11	55
E9938050	GA938050	5.0	6	13	57
-	GA938060	6.0	6	13	57
E9938070	GA938070	7.0	10	16	66
-	GA938080	8.0	10	19	69
-	GA938090	9.0	10	19	69
E9938100	GA938100	10.0	10	22	72
-	GA938120	12.0	12	26	83
-	GA938140	14.0	12	26	83
E9938160	GA938160	16.0	16	32	92
E9938180	GA938180	18.0	16	32	92
E9938200	GA938200	20.0	20	38	104
-	GA938250	25.0	25	45	121

▶ Mill Diameter 1mm: Center match end teeth

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ −0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

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YG-1 CO., LTD.

TANK-POWER END MILLS

UNCOATED **E9941** SERIES
X-COATING **GA941** SERIES

HSS-PM, MULTI FLUTE SHORT LENGTH ROUGHING - FINE

HSS-PM, MULTI SCHNEIDEN KURZ SCHRUPPFRÄSER - FEIN
FRAISES HSS-PM, MULTI-DENTS RAVAGEUSE - PAS FINS, SÉRIE COURTE
MULTI TAGL., PER SGROSSATURA, SERIE CORTA, BOMBATO FINE - HSS PM

- Suitable for high-feed roughing milling.
- Designed to machine carbon steels, alloyed steels, stainless steels.
- Providing excellent finished surfaces in many cases.
- YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- up to Ø20 : center cut, over Ø20 : non center cut

- Geeignet zum HSC - Schrupp - Fräsen.
- Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- Liefert in vielen Fällen exzellent bearbeitete Oberflächen.
- Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.
- Bis D=20mm : Mit Zentrumschneide, über D=20mm : Ohne Zentrumschneide.

up to Ø9 Ø10 ~ Ø20 over Ø20

HSS PM | DIN 844 | HR | 3-5 | 30° | DIN 1835B | ~Ø20 | Ø22~ | C x 45° | UNCOATED | X Coating

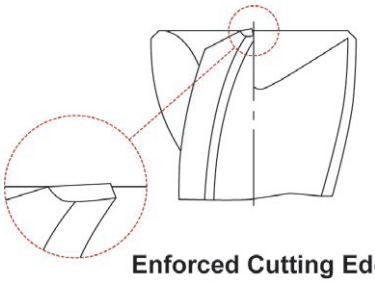
p.C680~C681

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
UNCOATED	X-COATING	js12	h6				
-	GA941060	6.0	6	13	57	3	0.18
E9941070	GA941070	7.0	10	16	66	3	0.18
-	GA941080	8.0	10	19	69	3	0.18
-	GA941090	9.0	10	19	69	3	0.18
-	GA941100	10.0	10	22	72	4	0.18
-	GA941120	12.0	12	26	83	4	0.18
-	GA941140	14.0	12	26	83	4	0.25
-	GA941160	16.0	16	32	92	4	0.25
-	GA941180	18.0	16	32	92	4	0.25
-	GA941200	20.0	20	38	104	4	0.25
-	GA941220	22.0	20	38	104	5	0.36
-	GA941250	25.0	25	45	121	5	0.36

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

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YG-1 CO., LTD.

TANK-POWER END MILLS

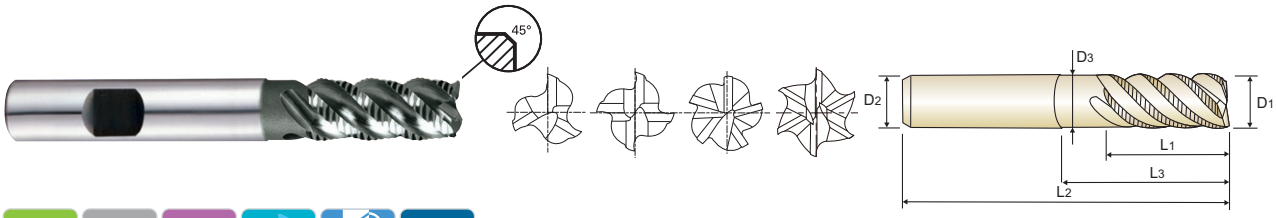
UNCOATED **E9A26** SERIES
X-COATING **GAA26** SERIES

HSS-PM, MULTI FLUTE 45°HELIX SHORT LENGTH ROUGHING - FINE

HSS-PM, MULTI SCHNEIDEN 45°RECHTSSPIRALE KURZ SCHRUPFRÄSER - FEIN
FRAISES HSS-PM, MULTI-DENTS RAVAGEUSE HÉLICE À 45° - PAS FINS, SÉRIE COURTE
MULTI TAGL., ELICA 45°, PER SGROS., SERIE CORTA, BOMBATO FINE - HSS PM

- High chip removal and minimizing breakages of cutting edges.
- Designed to machine carbon steels, alloyed steels, stainless steels
- YG-1's new developed TANK-POWER Coating suitable for high speed cutting

- Schnelle Spanabfuhr und Minimierung von Schneidkantenausbrüchen
- Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



HSS PM | DIN 844 | HR | 3-6 | 45° | DIN 1835B | C x 45° | UNCOATED | X Coating

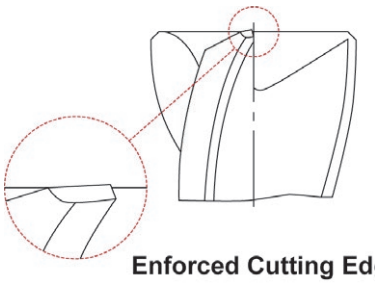
p.C682~C683

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute	Chamfer
UNCOATED	X-COATING	D1(js12)	D2(h6)	L1	L3	L2	D3		
-	GAA26040	4.0	6	11	-	57	-	3	0.1
E9A26050	GAA26050	5.0	6	13	-	57	-	4	0.13
-	GAA26060	6.0	6	13	-	57	-	4	0.15
-	GAA26070	7.0	10	16	-	66	-	4	0.15
-	GAA26080	8.0	10	19	-	69	-	4	0.18
-	GAA26090	9.0	10	19	-	69	-	4	0.18
-	GAA26100	10.0	10	22	31	72	9.5	4	0.20
-	GAA26120	12.0	12	26	37	83	11.5	4	0.20
-	GAA26140	14.0	12	26	-	83	-	5	0.20
-	GAA26160	16.0	16	32	44	92	15	5	0.20
-	GAA26180	18.0	16	32	-	92	-	6	0.20
-	GAA26200	20.0	20	38	54	104	19	6	0.20
E9A26250	GAA26250	25.0	25	45	63	121	24	6	0.20

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

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YG-1 CO., LTD.

TANK-POWER END MILLS

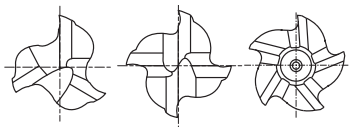
UNCOATED **E9A34** SERIES
X-COATING **GAA34** SERIES

HSS-PM, MULTI FLUTE LONG LENGTH ROUGHING - COARSE

HSS-PM, MULTI SCHNEIDEN LANG SCHRUPPFRÄSER - GROB
FRAISES HSS-PM, MULTI-DENTS RAVAGEUSE - PAS GROSSIERS, SÉRIE LONGUE
MULTI TAGL., PER SGROSSATURA, SERIE LUNGA, BOMBATO GROSSO - HSS PM

- Suitable for high-feed roughing milling.
- Designed to machine carbon steels, alloyed steels, stainless steels.
- YG-1's new developed TANK-POWER Coating suitable for high speed cutting.
- up to Ø20 : center cut, over Ø20 : non center cut

- Geeignet zum HSC - Schrupp - Fräsen.
- Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.
- Bis D<=20mm : mit Zentrumschnitt, über D<=20mm : Ohne Zentrumschnitt.



up to Ø9 | Ø10 ~ Ø20 | over Ø20

HSS PM | DIN 844 | NR | 3-5 | 30° | DIN 1835B | ~Ø20 | Ø22~ | C x 45° | UNCOATED | X Coating

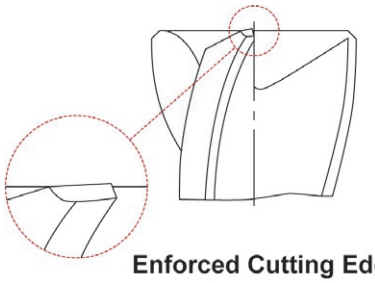
p.C680~C681

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
UNCOATED	X-COATING	js12	h6				
-	GAA34060	6.0	6	24	68	3	0.25
-	GAA34070	7.0	10	30	80	3	0.25
-	GAA34080	8.0	10	38	88	3	0.25
E9A34090	-	9.0	10	38	88	3	0.36
E9A34100	GAA34100	10.0	10	45	95	4	0.36
-	GAA34140	14.0	12	53	110	4	0.55
-	GAA34160	16.0	16	63	123	4	0.55
-	GAA34180	18.0	16	63	123	4	0.55
-	GAA34200	20.0	20	75	141	4	0.55
-	GAA34220	22.0	20	75	141	5	0.55
-	GAA34250	25.0	25	90	166	5	0.55

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛ / Nominal-Diameter in ㎜	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 / - 6	0 / - 8	0 / - 9	0 / - 11	0 / - 13	0 / - 16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend						○	○	○													

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YG-1 CO., LTD.

TANK-POWER END MILLS

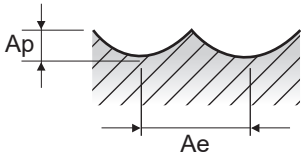
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GA940 , GAA32 SERIES — 2 FLUTE BALL NOSE

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1	Non-alloy steel	0.5D	0.2D	Vc	70	75	85	85	85	85	85	85	75
					fz	0.023	0.036	0.055	0.079	0.109	0.115	0.141	0.156	0.163
					RPM	7427	5968	4509	3382	2706	2255	1691	1353	955
					FEED	342	430	496	534	590	519	477	422	311
	2		0.5D	0.2D	Vc	55	60	65	65	65	70	65	65	60
					fz	0.02	0.031	0.046	0.067	0.095	0.097	0.123	0.14	0.142
					RPM	5836	4775	3448	2586	2069	1857	1293	1035	764
					FEED	233	296	317	347	393	360	318	290	217
	3-4		0.5D	0.2D	Vc	35	40	45	45	45	45	45	45	35
					fz	0.016	0.027	0.039	0.056	0.082	0.083	0.101	0.11	0.122
					RPM	3714	3183	2387	1790	1432	1194	895	716	446
					FEED	119	172	186	201	235	198	181	158	109
	5		0.5D	0.2D	Vc	20	20	25	20	20	20	20	25	20
					fz	0.014	0.023	0.035	0.048	0.075	0.073	0.091	0.097	0.104
					RPM	2122	1592	1326	796	637	531	398	398	255
					FEED	59	73	93	76	95	77	72	77	53
	6	Low alloy steel	0.5D	0.2D	Vc	55	60	65	65	65	70	65	65	60
					fz	0.02	0.031	0.046	0.067	0.095	0.097	0.123	0.14	0.142
					RPM	5836	4775	3448	2586	2069	1857	1293	1035	764
					FEED	233	296	317	347	393	360	318	290	217
	7		0.5D	0.2D	Vc	35	40	45	45	45	45	45	45	35
					fz	0.016	0.027	0.039	0.056	0.082	0.083	0.101	0.11	0.122
					RPM	3714	3183	2387	1790	1432	1194	895	716	446
					FEED	119	172	186	201	235	198	181	158	109
	8-9		0.5D	0.2D	Vc	20	20	25	20	20	20	20	25	20
					fz	0.014	0.023	0.035	0.048	0.075	0.073	0.091	0.097	0.104
					RPM	2122	1592	1326	796	637	531	398	398	255
					FEED	59	73	93	76	95	77	72	77	53
	10	High alloyed steel, and tool steel	0.5D	0.2D	Vc	55	60	65	65	65	70	65	65	60
					fz	0.02	0.031	0.046	0.067	0.095	0.097	0.123	0.14	0.142
					RPM	5836	4775	3448	2586	2069	1857	1293	1035	764
					FEED	233	296	317	347	393	360	318	290	217
	11.1		0.5D	0.2D	Vc	20	20	25	20	20	20	20	25	20
					fz	0.014	0.023	0.035	0.048	0.075	0.073	0.091	0.097	0.104
					RPM	2122	1592	1326	796	637	531	398	398	255
					FEED	59	73	93	76	95	77	72	77	53
M	14.1	Stainless steel	0.5D	0.2D	Vc	20	20	25	25	25	25	25	25	20
					fz	0.014	0.023	0.036	0.048	0.073	0.074	0.092	0.1	0.1
					RPM	2122	1592	1326	995	796	663	497	398	255
					FEED	59	73	95	95	116	98	92	80	51
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	0.2D	Vc	55	60	65	65	65	70	65	65	60
					fz	0.02	0.031	0.046	0.067	0.095	0.097	0.123	0.14	0.142
					RPM	5836	4775	3448	2586	2069	1857	1293	1035	764
					FEED	233	296	317	347	393	360	318	290	217

※ The FEED, in long & extra long types, should be reduced by around 50%



TANK-POWER END MILLS

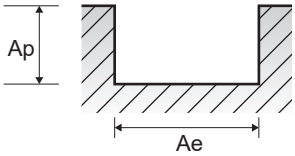
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GA936 , GAA29 SERIES — 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	45	45	55	60	65	65	65	70	70	70	65	60	60	60
					fz	0.008	0.016	0.027	0.033	0.038	0.053	0.071	0.076	0.083	0.098	0.104	0.116	0.11	0.103
					RPM	7162	4775	4377	3820	3448	2586	2069	1857	1592	1393	1149	955	868	764
					FEED	115	153	236	252	262	274	294	282	264	273	239	222	191	157
	2		1.0D	0.5D	Vc	35	40	45	50	55	55	55	55	55	60	55	50	50	50
					fz	0.008	0.016	0.024	0.031	0.036	0.055	0.074	0.083	0.084	0.085	0.103	0.106	0.106	0.111
					RPM	5570	4244	3581	3183	2918	2188	1751	1459	1251	1194	973	796	723	637
					FEED	89	136	172	197	210	241	259	242	210	203	200	169	153	141
	3-4		1.0D	0.5D	Vc	30	30	40	40	45	45	45	45	45	45	45	45	40	40
					fz	0.008	0.017	0.025	0.036	0.041	0.056	0.079	0.091	0.098	0.101	0.101	0.107	0.104	0.117
					RPM	4775	3183	3183	2546	2387	1790	1432	1194	1023	895	796	716	579	509
					FEED	76	108	159	183	196	201	226	217	201	181	161	153	120	119
	5		1.0D	0.5D	Vc	45	45	55	60	65	65	65	70	70	70	65	60	60	60
					fz	0.008	0.016	0.027	0.033	0.038	0.053	0.071	0.076	0.083	0.098	0.104	0.116	0.11	0.103
					RPM	7162	4775	4377	3820	3448	2586	2069	1857	1592	1393	1149	955	868	764
					FEED	115	153	236	252	262	274	294	282	264	273	239	222	191	157
	6	Low alloy steel	1.0D	0.5D	Vc	35	40	45	50	55	55	55	55	55	60	55	50	50	50
					fz	0.008	0.016	0.024	0.031	0.036	0.055	0.074	0.083	0.084	0.085	0.103	0.106	0.106	0.111
					RPM	5570	4244	3581	3183	2918	2188	1751	1459	1251	1194	973	796	723	637
					FEED	89	136	172	197	210	241	259	242	210	203	200	169	153	141
	7		1.0D	0.5D	Vc	30	30	40	40	45	45	45	45	45	45	45	45	40	40
					fz	0.008	0.017	0.025	0.036	0.041	0.056	0.079	0.091	0.098	0.101	0.101	0.107	0.104	0.117
					RPM	4775	3183	3183	2546	2387	1790	1432	1194	1023	895	796	716	579	509
					FEED	76	108	159	183	196	201	226	217	201	181	161	153	120	119
	8		1.0D	0.5D	Vc	45	45	55	60	65	65	65	70	70	70	65	60	60	60
					fz	0.008	0.016	0.027	0.033	0.038	0.053	0.071	0.076	0.083	0.098	0.104	0.116	0.11	0.103
					RPM	7162	4775	4377	3820	3448	2586	2069	1857	1592	1393	1149	955	868	764
					FEED	115	153	236	252	262	274	294	282	264	273	239	222	191	157
	9		1.0D	0.5D	Vc	35	40	45	50	55	55	55	55	55	60	55	50	50	50
					fz	0.008	0.016	0.024	0.031	0.036	0.055	0.074	0.083	0.084	0.085	0.103	0.106	0.106	0.111
					RPM	5570	4244	3581	3183	2918	2188	1751	1459	1251	1194	973	796	723	637
					FEED	89	136	172	197	210	241	259	242	210	203	200	169	153	141
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	35	40	45	50	55	55	55	55	55	60	55	50	50	50
					fz	0.008	0.016	0.024	0.031	0.036	0.055	0.074	0.083	0.084	0.085	0.103	0.106	0.106	0.111
					RPM	5570	4244	3581	3183	2918	2188	1751	1459	1251	1194	973	796	723	637
					FEED	89	136	172	197	210	241	259	242	210	203	200	169	153	141
	11.1		1.0D	0.5D	Vc	45	45	55	60	65	65	65	70	70	70	65	60	60	60
					fz	0.008	0.016	0.027	0.033	0.038	0.053	0.071	0.076	0.083	0.098	0.104	0.116	0.11	0.103
					RPM	7162	4775	4377	3820	3448	2586	2069	1857	1592	1393	1149	955	868	764
					FEED	115	153	236	252	262	274	294	282	264	273	239	222	191	157
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	Vc	35	40	45	50	55	55	55	55	55	60	55	50	50	50
					fz	0.008	0.016	0.024	0.031	0.036	0.055	0.074	0.083	0.084	0.085	0.103	0.106	0.106	0.111
					RPM	5570	4244	3581	3183	2918	2188	1751	1459	1251	1194	973	796	723	637
					FEED	89	136	172	197	210	241	259	242	210	203	200	169	153	141

※ The FEED, in long & extra long types, should be reduced by around 50%



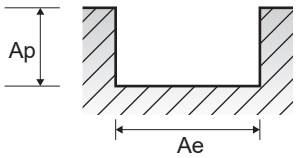
TANK-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GA942 , GAA30 SERIES — 3 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	40	45	55	60	65	65	65	70	70	70	65	60	60	60
					fz	0.004	0.007	0.011	0.014	0.023	0.031	0.033	0.051	0.052	0.059	0.07	0.081	0.091	0.107
					RPM	6366	4775	4377	3820	3448	2586	2069	1857	1592	1393	1149	955	868	764
					FEED	76	100	144	160	238	241	205	284	248	246	241	232	237	245
	2		1.0D	0.5D	Vc	35	35	45	50	55	55	55	55	60	60	50	50	50	50
					fz	0.003	0.007	0.011	0.014	0.023	0.032	0.039	0.053	0.054	0.061	0.071	0.08	0.089	0.111
					RPM	5570	3714	3581	3183	2918	2188	1751	1459	1364	1194	884	796	723	637
					FEED	50	78	118	134	201	210	205	232	221	218	188	191	193	212
	3-4		1.0D	0.5D	Vc	30	30	40	40	45	45	45	45	45	45	45	45	40	40
					fz	0.003	0.005	0.009	0.012	0.02	0.028	0.038	0.047	0.053	0.056	0.063	0.067	0.083	0.109
					RPM	4775	3183	3183	2546	2387	1790	1432	1194	1023	895	796	716	579	509
					FEED	43	48	86	92	143	150	163	168	163	150	150	144	144	167
	5		1.0D	0.5D	Vc	20	20	25	25	25	30	30	30	30	30	30	30	30	30
					fz	0.004	0.007	0.009	0.012	0.021	0.03	0.043	0.052	0.056	0.061	0.063	0.07	0.079	0.094
					RPM	3183	2122	1989	1592	1326	1194	955	796	682	597	531	477	434	382
					FEED	38	45	54	57	84	107	123	124	115	109	100	100	103	108
	6	Low alloy steel	1.0D	0.5D	Vc	35	35	45	50	55	55	55	55	60	60	50	50	50	50
					fz	0.003	0.007	0.011	0.014	0.023	0.032	0.039	0.053	0.054	0.061	0.071	0.08	0.089	0.111
					RPM	5570	3714	3581	3183	2918	2188	1751	1459	1364	1194	884	796	723	637
					FEED	50	78	118	134	201	210	205	232	221	218	188	191	193	212
	7		1.0D	0.5D	Vc	30	30	40	40	45	45	45	45	45	45	45	45	40	40
					fz	0.003	0.005	0.009	0.012	0.02	0.028	0.038	0.047	0.053	0.056	0.063	0.067	0.083	0.109
					RPM	4775	3183	3183	2546	2387	1790	1432	1194	1023	895	796	716	579	509
					FEED	43	48	86	92	143	150	163	168	163	150	150	144	144	167
	8		1.0D	0.5D	Vc	20	20	25	25	25	30	30	30	30	30	30	30	30	30
					fz	0.004	0.007	0.009	0.012	0.021	0.03	0.043	0.052	0.056	0.061	0.063	0.07	0.079	0.094
					RPM	3183	2122	1989	1592	1326	1194	955	796	682	597	531	477	434	382
					FEED	38	45	54	57	84	107	123	124	115	109	100	100	103	108
	9		1.0D	0.5D	Vc	10	15	20	20	20	20	20	20	20	20	25	25	20	20
					fz	0.005	0.008	0.012	0.014	0.023	0.032	0.045	0.053	0.057	0.064	0.067	0.074	0.09	0.113
					RPM	1592	1592	1592	1273	1061	796	637	531	455	398	442	398	289	255
					FEED	24	38	57	53	73	76	86	84	78	76	89	88	78	86
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	35	35	45	50	55	55	55	55	60	60	50	50	50	50
					fz	0.003	0.007	0.011	0.014	0.023	0.032	0.039	0.053	0.054	0.061	0.071	0.08	0.089	0.111
					RPM	5570	3714	3581	3183	2918	2188	1751	1459	1364	1194	884	796	723	637
					FEED	50	78	118	134	201	210	205	232	221	218	188	191	193	212
	11.1		1.0D	0.5D	Vc	20	20	25	25	25	30	30	30	30	30	30	30	30	30
					fz	0.004	0.007	0.009	0.012	0.021	0.03	0.043	0.052	0.056	0.061	0.063	0.07	0.079	0.094
					RPM	3183	2122	1989	1592	1326	1194	955	796	682	597	531	477	434	382
					FEED	38	45	54	57	84	107	123	124	115	109	100	100	103	108
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	Vc	35	35	45	50	55	55	55	55	60	60	50	50	50	50
					fz	0.003	0.007	0.011	0.014	0.023	0.032	0.039	0.053	0.054	0.061	0.071	0.08	0.089	0.111
					RPM	5570	3714	3581	3183	2918	2188	1751	1459	1364	1194	884	796	723	637
					FEED	50	78	118	134	201	210	205	232	221	218	188	191	193	212



TANK-POWER END MILLS

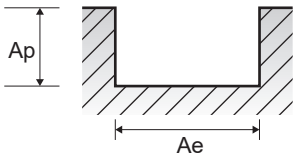
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E9942 , E9A30 SERIES

3 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	30	30	35	40	45	45	45	45	45	45	45	40	40	40
					fz	0.003	0.007	0.01	0.013	0.021	0.028	0.037	0.047	0.048	0.054	0.064	0.076	0.085	0.096
					RPM	4775	3183	2785	2546	2387	1790	1432	1194	1023	895	796	637	579	509
					FEED	43	67	84	99	150	150	159	168	147	145	153	145	148	147
	2		1.0D	0.5D	Vc	25	25	30	35	35	40	40	40	40	40	35	35	35	35
					fz	0.003	0.007	0.01	0.012	0.021	0.029	0.036	0.048	0.048	0.056	0.066	0.075	0.08	0.101
					RPM	3979	2653	2387	2228	1857	1592	1273	1061	909	796	619	557	506	446
					FEED	36	56	72	80	117	138	138	153	131	134	123	125	122	135
	3-4		1.0D	0.5D	Vc	20	30	25	30	30	30	30	30	30	30	30	30	30	25
					fz	0.003	0.003	0.008	0.01	0.018	0.026	0.035	0.043	0.049	0.052	0.06	0.059	0.077	0.098
					RPM	3183	3183	1989	1910	1592	1194	955	796	682	597	531	477	434	318
					FEED	29	29	48	57	86	93	100	103	100	93	95	85	100	94
	5		1.0D	0.5D	Vc	15	15	15	15	20	20	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.009	0.012	0.018	0.028	0.038	0.047	0.048	0.057	0.057	0.061	0.074	0.09
					RPM	2387	1592	1194	955	1061	796	637	531	455	398	354	318	289	255
					FEED	21	33	32	34	57	67	73	75	65	68	60	58	64	69
	6	Low alloy steel	1.0D	0.5D	Vc	25	25	30	35	35	40	40	40	40	40	35	35	35	35
					fz	0.003	0.007	0.01	0.012	0.021	0.029	0.036	0.048	0.048	0.056	0.066	0.075	0.08	0.101
					RPM	3979	2653	2387	2228	1857	1592	1273	1061	909	796	619	557	506	446
					FEED	36	56	72	80	117	138	138	153	131	134	123	125	122	135
	7		1.0D	0.5D	Vc	20	30	25	30	30	30	30	30	30	30	30	30	30	25
					fz	0.003	0.003	0.008	0.01	0.018	0.026	0.035	0.043	0.049	0.052	0.06	0.059	0.077	0.098
					RPM	3183	3183	1989	1910	1592	1194	955	796	682	597	531	477	434	318
					FEED	29	29	48	57	86	93	100	103	100	93	95	85	100	94
	8		1.0D	0.5D	Vc	15	15	15	15	20	20	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.009	0.012	0.018	0.028	0.038	0.047	0.048	0.057	0.057	0.061	0.074	0.09
					RPM	2387	1592	1194	955	1061	796	637	531	455	398	354	318	289	255
					FEED	21	33	32	34	57	67	73	75	65	68	60	58	64	69
	9		1.0D	0.5D	Vc	10	10	15	15	15	15	15	15	15	15	15	15	15	15
					fz	0.005	0.008	0.012	0.013	0.02	0.03	0.042	0.049	0.053	0.061	0.062	0.068	0.085	0.108
					RPM	1592	1061	1194	955	796	597	477	398	341	298	265	239	217	191
					FEED	24	25	43	37	48	54	60	58	54	55	49	49	55	62
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	25	25	30	35	35	40	40	40	40	40	35	35	35	35
					fz	0.003	0.007	0.01	0.012	0.021	0.029	0.036	0.048	0.048	0.056	0.066	0.075	0.08	0.101
					RPM	3979	2653	2387	2228	1857	1592	1273	1061	909	796	619	557	506	446
					FEED	36	56	72	80	117	138	138	153	131	134	123	125	122	135
	11.1		1.0D	0.5D	Vc	15	15	15	15	20	20	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.009	0.012	0.018	0.028	0.038	0.047	0.048	0.057	0.057	0.061	0.074	0.09
					RPM	2387	1592	1194	955	1061	796	637	531	455	398	354	318	289	255
					FEED	21	33	32	34	57	67	73	75	65	68	60	58	64	69
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	Vc	25	25	30	35	35	40	40	40	40	40	35	35	35	35
					fz	0.003	0.007	0.01	0.012	0.021	0.029	0.036	0.048	0.048	0.056	0.066	0.075	0.08	0.101
					RPM	3979	2653	2387	2228	1857	1592	1273	1061	909	796	619	557	506	446
					FEED	36	56	72	80	117	138	138	153	131	134	123	125	122	135



TANK-POWER END MILLS

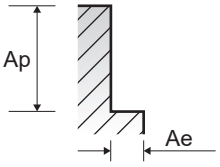
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GA938 , GAA31 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	60	60	65	70	75	80	70	75	80	80	85	80	75	80
					fz	0.008	0.016	0.023	0.029	0.035	0.046	0.068	0.071	0.076	0.08	0.077	0.088	0.098	0.093
					RPM	9549	6366	5173	4456	3979	3183	2228	1989	1819	1592	1503	1273	1085	1019
					FEED	306	407	476	517	557	586	606	565	553	509	463	448	425	379
	2		0.1D	1.5D	Vc	55	55	60	65	70	65	65	70	70	70	70	65	65	65
					fz	0.007	0.015	0.021	0.026	0.031	0.046	0.063	0.067	0.072	0.077	0.08	0.088	0.084	0.091
					RPM	8754	5836	4775	4138	3714	2586	2069	1857	1592	1393	1238	1035	940	828
					FEED	245	350	401	430	460	476	521	498	458	429	396	364	316	301
	3-4		0.1D	1.5D	Vc	40	40	45	45	50	50	50	55	50	50	50	50	45	50
					fz	0.007	0.014	0.021	0.028	0.032	0.046	0.059	0.066	0.08	0.085	0.087	0.088	0.094	0.091
					RPM	6366	4244	3581	2865	2653	1989	1592	1459	1137	995	884	796	651	637
					FEED	178	238	301	321	340	366	376	385	364	338	308	280	245	232
	5		0.1D	1.5D	Vc	25	25	30	30	35	35	30	35	35	35	35	35	30	35
					fz	0.008	0.017	0.022	0.028	0.032	0.043	0.066	0.067	0.073	0.081	0.077	0.083	0.085	0.089
					RPM	3979	2653	2387	1910	1857	1393	955	928	796	696	619	557	434	446
					FEED	127	180	210	214	238	240	252	249	232	226	191	185	148	159
	6	Low alloy steel	0.1D	1.5D	Vc	55	55	60	65	70	65	65	70	70	70	70	65	65	65
					fz	0.007	0.015	0.021	0.026	0.031	0.046	0.063	0.067	0.072	0.077	0.08	0.088	0.084	0.091
					RPM	8754	5836	4775	4138	3714	2586	2069	1857	1592	1393	1238	1035	940	828
					FEED	245	350	401	430	460	476	521	498	458	429	396	364	316	301
	7		0.1D	1.5D	Vc	40	40	45	45	50	50	50	55	50	50	50	50	45	50
					fz	0.007	0.014	0.021	0.028	0.032	0.046	0.059	0.066	0.08	0.085	0.087	0.088	0.094	0.091
					RPM	6366	4244	3581	2865	2653	1989	1592	1459	1137	995	884	796	651	637
					FEED	178	238	301	321	340	366	376	385	364	338	308	280	245	232
	8		0.1D	1.5D	Vc	25	25	30	30	35	35	30	35	35	35	35	35	30	35
					fz	0.008	0.017	0.022	0.028	0.032	0.043	0.066	0.067	0.073	0.081	0.077	0.083	0.085	0.089
					RPM	3979	2653	2387	1910	1857	1393	955	928	796	696	619	557	434	446
					FEED	127	180	210	214	238	240	252	249	232	226	191	185	148	159
	9		0.1D	1.5D	Vc	20	25	25	25	25	30	30	25	30	30	30	30	30	30
					fz	0.006	0.013	0.019	0.024	0.031	0.04	0.056	0.064	0.067	0.075	0.075	0.08	0.081	0.087
					RPM	3183	2653	1989	1592	1326	1194	955	663	682	597	531	477	434	382
					FEED	76	138	151	153	164	191	214	170	183	179	159	153	141	133
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	55	55	60	65	70	65	65	70	70	70	70	65	65	65
					fz	0.007	0.015	0.021	0.026	0.031	0.046	0.063	0.067	0.072	0.077	0.08	0.088	0.084	0.091
					RPM	8754	5836	4775	4138	3714	2586	2069	1857	1592	1393	1238	1035	940	828
					FEED	245	350	401	430	460	476	521	498	458	429	396	364	316	301
	11.1		0.1D	1.5D	Vc	25	25	30	30	35	35	30	35	35	35	35	35	30	35
					fz	0.008	0.017	0.022	0.028	0.032	0.043	0.066	0.067	0.073	0.081	0.077	0.083	0.085	0.089
					RPM	3979	2653	2387	1910	1857	1393	955	928	796	696	619	557	434	446
					FEED	127	180	210	214	238	240	252	249	232	226	191	185	148	159
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	Vc	55	55	60	65	70	65	65	70	70	70	70	65	65	65
					fz	0.007	0.015	0.021	0.026	0.031	0.046	0.063	0.067	0.072	0.077	0.08	0.088	0.084	0.091
					RPM	8754	5836	4775	4138	3714	2586	2069	1857	1592	1393	1238	1035	940	828
					FEED	245	350	401	430	460	476	521	498	458	429	396	364	316	301

※ The FEED, in long & extra long types, should be reduced by around 50%



TANK-POWER END MILLS

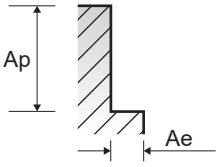
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GA941 , GAA35 , GAA33 , GAA34 SERIES — MULTI FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	22.0	25.0	18.0	20.0	22.0	25.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	55	60	60	60	60	60	60	60	60	60
					fz	0.027	0.04	0.055	0.065	0.074	0.086	0.099	0.111	0.096	0.105
					RPM	2918	2387	1910	1592	1364	1194	1061	955	868	764
					FEED	236	286	420	414	404	411	420	424	417	401
	2		0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45
					fz	0.027	0.04	0.053	0.069	0.079	0.087	0.093	0.109	0.102	0.105
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573
					FEED	172	239	304	329	323	346	329	347	332	301
	3-4		0.5D	1.5D	Vc	30	35	35	35	35	35	35	35	30	35
					fz	0.024	0.038	0.046	0.064	0.076	0.087	0.094	0.108	0.098	0.105
					RPM	1592	1393	1114	928	796	696	619	557	434	446
					FEED	115	159	205	238	242	242	233	241	213	234
	5		0.5D	1.5D	Vc	25	25	30	30	30	30	30	30	30	30
					fz	0.027	0.04	0.045	0.061	0.071	0.082	0.092	0.102	0.09	0.1
					RPM	1326	995	955	796	682	597	531	477	434	382
					FEED	107	119	172	194	194	196	195	195	195	191
	6	Low alloy steel	0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45
					fz	0.027	0.04	0.053	0.069	0.079	0.087	0.093	0.109	0.102	0.105
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573
					FEED	172	239	304	329	323	346	329	347	332	301
	7		0.5D	1.5D	Vc	30	35	35	35	35	35	35	35	30	35
					fz	0.024	0.038	0.046	0.064	0.076	0.087	0.094	0.108	0.098	0.105
					RPM	1592	1393	1114	928	796	696	619	557	434	446
					FEED	115	159	205	238	242	242	233	241	213	234
	8-9		0.5D	1.5D	Vc	25	25	30	30	30	30	30	30	30	30
					fz	0.027	0.04	0.045	0.061	0.071	0.082	0.092	0.102	0.09	0.1
					RPM	1326	995	955	796	682	597	531	477	434	382
					FEED	107	119	172	194	194	196	195	195	195	191
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45
					fz	0.027	0.04	0.053	0.069	0.079	0.087	0.093	0.109	0.102	0.105
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573
					FEED	172	239	304	329	323	346	329	347	332	301
	11.1		0.5D	1.5D	Vc	25	25	30	30	30	30	30	30	30	30
					fz	0.027	0.04	0.045	0.061	0.071	0.082	0.092	0.102	0.09	0.1
					RPM	1326	995	955	796	682	597	531	477	434	382
					FEED	107	119	172	194	194	196	195	195	195	191
M	14.1	Stainless steel	0.5D	1.5D	Vc	25	30	30	30	30	30	30	30	30	30
					fz	0.025	0.039	0.045	0.064	0.074	0.085	0.093	0.107	0.095	0.103
					RPM	1326	1194	955	796	682	597	531	477	434	382
					FEED	99	140	172	204	202	203	197	204	206	197
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45
					fz	0.027	0.04	0.053	0.069	0.079	0.087	0.093	0.109	0.102	0.105
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573
					FEED	172	239	304	329	323	346	329	347	332	301

※ The FEED, in long & extra long types, should be reduced by around 50%



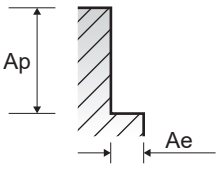
TANK-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GAA26 SERIES — MULTI FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	55	60	60	60	60	60	60	60	60	60
					fz	0.021	0.03	0.055	0.065	0.059	0.069	0.066	0.074	0.08	0.088
					RPM	2918	2387	1910	1592	1364	1194	1061	955	868	764
					FEED	245	286	420	414	402	412	420	424	417	403
	2		0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45
					fz	0.02	0.03	0.053	0.069	0.063	0.069	0.062	0.072	0.085	0.088
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573
					FEED	170	239	304	329	322	343	329	344	332	303
	3-4		0.5D	1.5D	Vc	30	35	35	35	35	35	35	35	30	35
					fz	0.018	0.029	0.046	0.064	0.061	0.07	0.063	0.072	0.082	0.087
					RPM	1592	1393	1114	928	796	696	619	557	434	446
					FEED	115	162	205	238	243	244	234	241	214	233
	5		0.5D	1.5D	Vc	25	25	30	30	30	30	30	30	30	30
					fz	0.02	0.03	0.045	0.061	0.057	0.065	0.061	0.068	0.075	0.083
					RPM	1326	995	955	796	682	597	531	477	434	382
					FEED	106	119	172	194	194	194	194	195	195	190
	6	Low alloy steel	0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45
					fz	0.02	0.03	0.053	0.069	0.063	0.069	0.062	0.072	0.085	0.088
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573
					FEED	170	239	304	329	322	343	329	344	332	303
	7		0.5D	1.5D	Vc	30	35	35	35	35	35	35	35	30	35
					fz	0.018	0.029	0.046	0.064	0.061	0.07	0.063	0.072	0.082	0.087
					RPM	1592	1393	1114	928	796	696	619	557	434	446
					FEED	115	162	205	238	243	244	234	241	214	233
	8-9		0.5D	1.5D	Vc	25	25	30	30	30	30	30	30	30	30
					fz	0.02	0.03	0.045	0.061	0.057	0.065	0.061	0.068	0.075	0.083
					RPM	1326	995	955	796	682	597	531	477	434	382
					FEED	106	119	172	194	194	194	194	195	195	190
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45
					fz	0.02	0.03	0.053	0.069	0.063	0.069	0.062	0.072	0.085	0.088
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573
					FEED	170	239	304	329	322	343	329	344	332	303
	11.1		0.5D	1.5D	Vc	25	25	30	30	30	30	30	30	30	30
					fz	0.02	0.03	0.045	0.061	0.057	0.065	0.061	0.068	0.075	0.083
					RPM	1326	995	955	796	682	597	531	477	434	382
					FEED	106	119	172	194	194	194	194	195	195	190
M	14.1	Stainless steel	0.5D	1.5D	Vc	25	30	30	30	30	30	30	30	30	30
					fz	0.019	0.029	0.045	0.064	0.059	0.068	0.062	0.071	0.079	0.085
					RPM	1326	1194	955	796	682	597	531	477	434	382
					FEED	101	138	172	204	201	203	197	203	206	195
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	Vc	40	50	45	45	45	50	50	50	45	45
					fz	0.02	0.03	0.053	0.069	0.063	0.069	0.062	0.072	0.085	0.088
					RPM	2122	1989	1432	1194	1023	995	884	796	651	573
					FEED	170	239	304	329	322	343	329	344	332	303



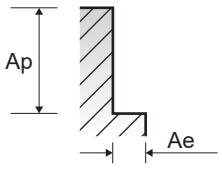
TANK-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

GAE43 SERIES — MULTI FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	10.0	12.0	16.0	20.0	25.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	60	60	60	60	60
					fz	0.047	0.055	0.074	0.094	0.09
					RPM	1910	1592	1194	955	764
					FEED	359	350	353	359	344
	2		0.5D	1.5D	Vc	47	47	47	47	47
					fz	0.045	0.058	0.074	0.092	0.09
					RPM	1496	1247	935	748	598
					FEED	269	289	277	275	269
	3-4		0.5D	1.5D	Vc	33	33	33	33	33
					fz	0.039	0.054	0.074	0.092	0.088
					RPM	1050	875	657	525	420
					FEED	164	189	194	193	185
	5		0.5D	1.5D	Vc	28	28	28	28	28
					fz	0.038	0.052	0.07	0.088	0.086
					RPM	891	743	557	446	357
					FEED	135	154	156	157	153
	6	Low alloy steel	0.5D	1.5D	Vc	47	47	47	47	47
					fz	0.045	0.058	0.074	0.092	0.09
					RPM	1496	1247	935	748	598
					FEED	269	289	277	275	269
	7		0.5D	1.5D	Vc	33	33	33	33	33
					fz	0.039	0.054	0.074	0.092	0.088
					RPM	1050	875	657	525	420
					FEED	164	189	194	193	185
	8-9		0.5D	1.5D	Vc	28	28	28	28	28
					fz	0.038	0.052	0.07	0.088	0.086
					RPM	891	743	557	446	357
					FEED	135	154	156	157	153
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	47	47	47	47	47
					fz	0.045	0.058	0.074	0.092	0.09
					RPM	1496	1247	935	748	598
					FEED	269	289	277	275	269
	11.1		0.5D	1.5D	Vc	28	28	28	28	28
					fz	0.038	0.052	0.07	0.088	0.086
					RPM	891	743	557	446	357
					FEED	135	154	156	157	153
M	14.1	Stainless steel	0.5D	1.5D	Vc	30	30	30	30	30
					fz	0.038	0.055	0.073	0.091	0.087
					RPM	955	796	597	477	382
					FEED	145	175	174	174	166
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	Vc	47	47	47	47	47
					fz	0.045	0.058	0.074	0.092	0.09
					RPM	1496	1247	935	748	598
					FEED	269	289	277	275	269



Leading Through Innovation

HSS

GENERAL HSS END MILLS

HSS SCHAFTFRÄSER

- General Purpose / Coating Available
- Allgemeine Anwendung / Beschichtung verfügbar

SELECTION GUIDE

YG MILLING TOOLS

SERIES	E2535 EQ535	E2492 EQ492	EL612	E2570 EQ570
FLUTE	2	2	1	2
HELIX ANGLE	30°	30°	≒30°	≒30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	SQUARE	SQUARE
SIZE MIN	R1.0	R1.0	D3.0	D1.0
SIZE MAX	R16.0	R15.0	D10.0	D40.0
PAGE	C689	C690	C691	C692
	SHORT LENGTH	LONG LENGTH	-	SHORT LENGTH
	Uncoated / TiAlN	Uncoated / TiAlN	Uncoated	Uncoated / TiAlN
	HSS Co8	HSS Co8	HSS-E	HSS Co8

HSS
GENERAL HSS END MILLS

General Purpose, Non-coated, Any Coating Available

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C719

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	○	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	○	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎		◎
	4		About 0.75% C	Annealed	270	28	◎	◎		◎
	5		About 0.75% C	Quenched & Tempered	300	32	○	○		○
	6	Low alloy steel		Annealed	180	10	◎	◎	○	◎
	7			Quenched & Tempered	275	29	◎	◎		◎
	8			Quenched & Tempered	300	32	○	○		○
	9			Quenched & Tempered	350	38	○	○		○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	○	◎
	11			Quenched & Tempered	325	35	○	○		○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	◎	○
	22		Curable	Hardened	100		○	○	◎	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	◎	○
	24		≤ 12% Si, Curable	Hardened	90		○	○	◎	○
	25		> 12% Si, Not Curable		130		○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

SELECTION GUIDE

YG MILLING TOOLS

HSS

GENERAL HSS END MILLS

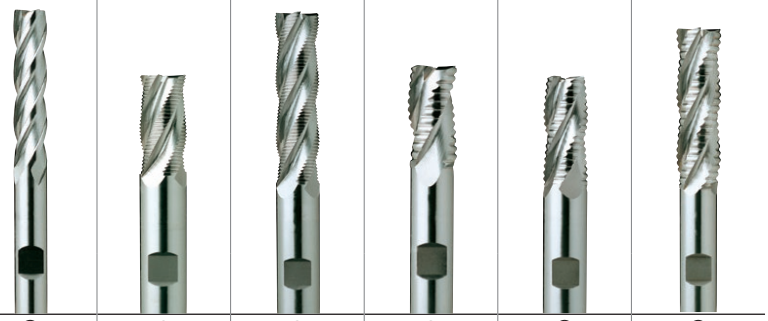
General Purpose, Non-coated, Any Coating Available

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C739

Please visit globalyg1.com/mat for material search

SERIES	E2597 EQ597	E2753 EQ753	E2762 EQ762	E2755	E2751 EQ751	E2752 EQ752
FLUTE	4	Multi Flute	Multi Flute	3	Multi Flute	Multi Flute
HELIX ANGLE	≈ 30°	30°	30°	37°	30°	30°
	SQUARE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING
SIZE MIN	D2.0	D6.0	D6.0	D6.0	D6.0	D6.0
SIZE MAX	D20.0	D32.0	D40.0	D25.0	D50.0	D40.0
PAGE	C711	C732	C713	C714	C715	C717
	LONG LENGTH CENTER CUT	SHORT LENGTH	LONG LENGTH	SHORT LENGTH	SHORT LENGTH	LONG LENGTH
	Uncoated / TiAlN	Uncoated / TiAlN	Uncoated / TiAlN	Uncoated	Uncoated / TiAlN	Uncoated / TiAlN
	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8



ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	○	◎	◎
	4		270	28	◎	◎	◎	○	◎	◎
	5		300	32	◎	◎	◎	○	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	○	◎	◎
	8		300	32	◎	◎	◎	○	◎	◎
	9		350	38	○	○	○		○	○
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎
	11		325	35	○	○	○		○	○
M	12	Stainless steel	200	15						
	13		240	23						
	14		180	10						
K	15	Grey cast iron	180	10						
	16		260	26						
	17	Nodular cast iron	160	3						
	18		250	25						
	19	Malleable cast iron	130							
	20		230	21						
N	21	Aluminum-wrought alloy	60		○	○	○	◎	○	○
	22		100		○	○	○	◎	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	◎	○	○
	24		90		○	○	○	◎	○	○
	25		130		○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55						
	39		630	60						
	40	Chilled Cast Iron	400	42						
	41	Hardened Cast Iron	550	55						

GENERAL HSS END MILLS

FLAT SHANK **E2492** SERIES
FLAT SHANK **EQ492** SERIES

HSS Co8, 2 FLUTE LONG LENGTH BALL NOSE

HSS Co8, 2 SCHNEIDEN LANG STIRNRADIUS
FRAISE HSS Co8, 2 DENTS, HÉMISPHÉRIQUE, LONGUE
2 TAGLIENTI, SEMISFERICA, SERIE LUNGA - HSS Co8

HSS Co8 | DIN 1889 | 2 | 30° | R ±0.02 | DIN 1835B | UNCOATED | TiAlN

p.C719~C720

Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	R (±0.02)		h6		
E2492020	-	R1.0	**2.0**	6	7	54
E2492030	-	R1.5	**3.0**	6	8	56
E2492040	-	R2.0	**4.0**	6	11	63
E2492050	-	R2.5	**5.0**	6	13	68
E2492060	**EQ492060**	R3.0	**6.0**	6	13	68
E2492070	-	R3.5	**7.0**	10	16	80
E2492080	-	R4.0	**8.0**	10	19	88
E2492090	**EQ492090**	R4.5	**9.0**	10	19	88
E2492100	-	R5.0	**10.0**	10	22	95
E2492110	-	R5.5	**11.0**	12	22	102
E2492120	-	R6.0	**12.0**	12	26	110
E2492130	-	R6.5	**13.0**	12	26	110
E2492140	-	R7.0	**14.0**	12	26	110
E2492150	-	R7.5	**15.0**	12	26	110
E2492160	-	R8.0	**16.0**	16	32	123
E2492180	-	R9.0	**18.0**	16	32	123
E2492190	-	R9.5	**19.0**	16	32	123
E2492200	-	R10.0	**20.0**	20	38	141
E2492220	-	R11.0	**22.0**	20	38	141
E2492240	-	R12.0	**24.0**	25	45	166
E2492250	-	R12.5	**25.0**	25	45	166
E2492260	-	R13.0	**26.0**	25	45	166
E2492280	-	R14.0	**28.0**	25	45	166
E2492300	-	R15.0	**30.0**	25	45	166

▶ Other shank design on your reguest.
▶ TiN and TiCN Coatings are available on your request.

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

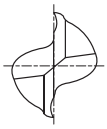
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

GENERAL HSS END MILLS

FLAT SHANK **E2570** SERIES
FLAT SHANK **EQ570** SERIES

HSS Co8, 2 FLUTE SHORT LENGTH

- HSS Co8, 2 SCHNEIDEN KURZ
- FRAISE HSS Co8, 2 DENTS, COURTE
- 2 TAGLIENTI, SERIE CORTA - HSS Co8



HSS Co8 | DIN 327 | 2 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C722~C725

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
E2570010	EQ570010	1.0	6	2.5	47
E2570015	EQ570015	1.5	6	3	47
E2570020	EQ570020	2.0	6	4	48
E2570025	EQ570025	2.5	6	5	49
E2570028	-	2.8	6	5	49
E2570030	EQ570030	3.0	6	5	49
E2570035	EQ570035	3.5	6	6	50
E2570038	EQ570038	3.8	6	7	51
E2570040	EQ570040	4.0	6	7	51
E2570045	EQ570045	4.5	6	7	51
E2570048	EQ570048	4.8	6	8	52
E2570050	EQ570050	5.0	6	8	52
E2570055	EQ570055	5.5	6	8	52
E2570957	EQ570957	5.8	6	8	52
E2570060	EQ570060	6.0	6	8	52
E2570065	-	6.5	10	10	60
E2570967	EQ570967	6.8	10	10	60
E2570070	EQ570070	7.0	10	10	60
E2570075	EQ570075	7.5	10	10	60
E2570977	EQ570977	7.8	10	11	61
E2570080	EQ570080	8.0	10	11	61
E2570085	EQ570085	8.5	10	11	61
E2570087	-	8.7	10	11	61
E2570090	-	9.0	10	11	61

▶ NEXT PAGE

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛ / Nominal-Diameter in ㎜	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

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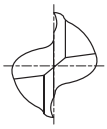
GENERAL HSS END MILLS

FLAT SHANK **E2570** SERIES
FLAT SHANK **EQ570** SERIES

HSS Co8, 2 FLUTE SHORT LENGTH

- HSS Co8, 2 SCHNEIDEN KURZ
- FRAISE HSS Co8, 2 DENTS, COURTE
- 2 TAGLIENTI, SERIE CORTA - HSS Co8



HSS Co8 | DIN 327 | 2 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C722~C725

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
E2570920	**EQ570920**	**20.0**	16	22	82
E2570200	**EQ570200**	**20.0**	20	22	88
E2570210	-	**21.0**	20	22	88
E2570220	**EQ570220**	**22.0**	20	22	88
-	**EQ570922**	**22.0**	25	22	98
E2570240	**EQ570240**	**24.0**	25	26	102
E2570250	**EQ570250**	**25.0**	25	26	102
E2570260	**EQ570260**	**26.0**	25	26	102
E2570270	-	**27.0**	25	26	102
E2570280	**EQ570280**	**28.0**	25	26	102
E2570290	-	**29.0**	25	26	102
E2570300	**EQ570300**	**30.0**	25	26	102
E2570320	**EQ570320**	**32.0**	32	32	112
E2570340	**EQ570340**	**34.0**	32	32	112
E2570350	-	**35.0**	32	32	112
E2570360	**EQ570360**	**36.0**	32	32	112
E2570380	-	**38.0**	32	38	118
-	**EQ570938**	**38.0**	40	38	130
E2570400	**EQ570400**	**40.0**	32	38	118
E2570903	**EQ570903**	**40.0**	40	38	130

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

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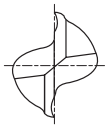
GENERAL HSS END MILLS

FLAT SHANK **E2571** SERIES
FLAT SHANK **EQ571** SERIES

HSS Co8, 2 FLUTE LONG LENGTH

- HSS Co8, 2 SCHNEIDEN LANG
- FRAISE HSS Co8, 2 DENTS, LONGUE
- 2 TAGLIENTI, SERIE LUNGA - HSS Co8



HSS Co8 | DIN 844 | 2 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C722~C725

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
E2571180	**EQ571180**	**18.0**	16	32	92
E2571200	**EQ571200**	**20.0**	20	38	104
E2571220	**EQ571220**	**22.0**	20	38	104
E2571250	**EQ571250**	**25.0**	25	45	121
-	**EQ571270**	**27.0**	25	45	121
E2571280	-	**28.0**	25	45	121
-	**EQ571300**	**30.0**	25	45	121
E2571320	-	**32.0**	32	53	133

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛ / Nominal-Diameter in ㎜	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

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YG-1 CO., LTD.

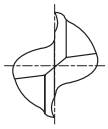
GENERAL HSS END MILLS

FLAT SHANK **E2464** SERIES

HSS Co8, 2 FLUTE 42° HELIX SHORT LENGTH for ALUMINUM

HSS Co8, 2 SCHNEIDEN 42° RECHTSSPIRALE KURZ FÜR ALUMINIUM
FRAISE HSS Co8, 2 DENTS, HÉLICE 42°, POUR ALUMINIUM, COURTE
2 TAGLIENTI, ELICA 42°, SERIE CORTA - HSS Co8

for ALUMINUM
für ALUMINIUM



HSS Co8 | DIN 844 | 2 | 42° | DIN 1835B | UNCOATED

p.C721

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	e8	h6		
E2464015	1.5	6	5	49
E2464020	2.0	6	7	51
E2464025	2.5	6	8	52
E2464030	3.0	6	8	52
E2464035	3.5	6	10	54
E2464040	4.0	6	11	55
E2464045	4.5	6	11	55
E2464050	5.0	6	13	57
E2464055	5.5	6	13	57
E2464060	6.0	6	13	57
E2464065	6.5	10	16	66
E2464070	7.0	10	16	66
E2464075	7.5	10	16	66
E2464080	8.0	10	19	69
E2464085	8.5	10	19	69
E2464090	9.0	10	19	69
E2464100	10.0	10	22	72
E2464110	11.0	12	22	79
E2464120	12.0	12	26	83
E2464130	13.0	12	26	83
E2464140	14.0	12	26	83
E2464150	15.0	12	26	83

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

▶ NEXT PAGE

Tolerances according to DIN 7160 & 7161

Tolerance range in μm / Nominal-Diameter in mm	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○				○				○										

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○																

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YG-1 CO., LTD.

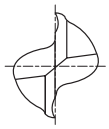
GENERAL HSS END MILLS

FLAT SHANK **E2509** SERIES

HSS Co8, 2 FLUTE 42° HELIX LONG LENGTH for ALUMINUM

HSS Co8, 2 SCHNEIDEN 42° RECHTSSPIRALE KURZ FÜR ALUMINIUM
FRAISE HSS Co8, 2 DENTS, HÉLICE 42°, POUR ALUMINIUM, LONGUE
2 TAGLIENTI, ELICA 42°, SERIE LUNGA - HSS Co8

for ALUMINUM
für ALUMINIUM



HSS Co8 | DIN 844 | 2 | 42° | DIN 1835B | UNCOATED

p.C721

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	e8	h6		
E2509020	**2.0**	6	10	54
E2509030	**3.0**	6	12	56
E2509040	**4.0**	6	19	63
E2509050	**5.0**	6	24	68
E2509060	**6.0**	6	24	68
E2509070	**7.0**	10	30	80
E2509080	**8.0**	10	38	88
E2509090	**9.0**	10	38	88
E2509100	**10.0**	10	45	95
E2509110	**11.0**	12	45	102
E2509120	**12.0**	12	53	110
E2509130	**13.0**	12	53	110
E2509140	**14.0**	12	53	110
E2509150	**15.0**	12	53	110
E2509160	**16.0**	16	63	123
E2509180	**18.0**	16	63	123
E2509200	**20.0**	20	75	141

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in µm						
Nominal-Diameter in mm						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	○	○				○				○										

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○																

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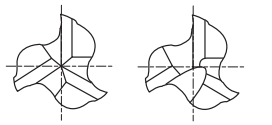
YG-1 CO., LTD.

GENERAL HSS END MILLS

FLAT SHANK **E2573** SERIES
FLAT SHANK **EQ573** SERIES

HSS Co8, 3 FLUTE SHORT LENGTH

HSS Co8, 3 SCHNEIDEN KURZ
FRAISE HSS Co8, 3 DENTS, COURTE
3 TAGLIENTI, SERIE CORTA - HSS Co8



Under Ø3mm Ø3mm or above

HSS Co8 | DIN 844 | 3 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C726~C733

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
E2573010	EQ573010	1.0	6	3	47
E2573015	EQ573015	1.5	6	7	51
E2573020	EQ573020	2.0	6	7	51
E2573025	EQ573025	2.5	6	8	52
E2573030	EQ573030	3.0	6	8	52
E2573035	EQ573035	3.5	6	10	54
E2573040	EQ573040	4.0	6	11	55
E2573045	EQ573045	4.5	6	11	55
E2573050	EQ573050	5.0	6	13	57
E2573055	EQ573055	5.5	6	13	57
E2573060	EQ573060	6.0	6	13	57
E2573065	EQ573065	6.5	10	16	66
E2573070	EQ573070	7.0	10	16	66
E2573075	EQ573075	7.5	10	16	66
E2573080	EQ573080	8.0	10	19	69
E2573085	EQ573085	8.5	10	19	69
E2573090	EQ573090	9.0	10	19	69
E2573095	-	9.5	10	19	69
E2573100	EQ573100	10.0	10	22	72
E2573120	EQ573120	12.0	12	26	83
E2573140	EQ573140	14.0	12	26	83
E2573150	EQ573150	15.0	12	26	83

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

▶ NEXT PAGE

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

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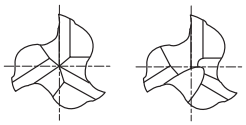
YG-1 CO., LTD.

GENERAL HSS END MILLS

FLAT SHANK **E2516** SERIES
FLAT SHANK **EQ516** SERIES

HSS Co8, 3 FLUTE LONG LENGTH

- HSS Co8, 3 SCHNEIDEN LANG
- FRAISE HSS Co8, 3 DENTS, LONGUE
- 3 TAGLIENTI, SERIE LUNGA - HSS Co8



Up to Ø2.5mm Over Ø2.5mm

HSS Co8 | DIN 844 | 3 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C726~C733

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
E2516020	-	2.0	6	10	54
E2516025	-	2.5	6	12	56
E2516030	EQ516030	3.0	6	12	56
E2516035	-	3.5	6	15	59
E2516040	EQ516040	4.0	6	19	63
E2516045	-	4.5	6	19	63
E2516050	EQ516050	5.0	6	24	68
E2516055	-	5.5	6	24	68
E2516060	EQ516060	6.0	6	24	68
E2516070	-	7.0	10	30	80
E2516075	EQ516075	7.5	10	30	80
E2516080	-	8.0	10	38	88
E2516090	-	9.0	10	38	88
E2516100	EQ516100	10.0	10	45	95
E2516110	-	11.0	12	45	102
E2516120	EQ516120	12.0	12	53	110
E2516130	-	13.0	12	53	110
E2516140	-	14.0	12	53	110
E2516150	-	15.0	12	53	110
E2516160	-	16.0	16	63	123
E2516170	-	17.0	16	63	123
E2516180	-	18.0	16	63	123

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

▶ NEXT PAGE

Tolerances according to DIN 7160 & 7161

Tolerance range in μm						
Nominal-Diameter in mm						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

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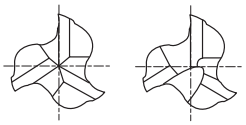
YG-1 CO., LTD.

GENERAL HSS END MILLS

FLAT SHANK **E2553** SERIES
FLAT SHANK **EQ553** SERIES

HSS Co8, 3 FLUTE SHORT LENGTH THROW AWAY

HSS Co8, 3 SCHNEIDEN KURZ EINWEGFRÄSER
FRAISE HSS Co8, 3 DENTS À JETER, COURTE
3 TAGLIENTI, SERIE CORTA NON RIAFFILABILE - HSS Co8



Up to Ø10mm Over Ø10mm

HSS Co8 | YG STD | 3 | 30° | FLAT | UNCOATED | TiAlN

p.C726~C733

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
E2553010	EQ553010	1.0	6	2	34
E2553013	EQ553013	1.3	6	3	34
E2553015	EQ553015	1.5	6	3	34
E2553018	-	1.8	6	3	34
E2553020	EQ553020	2.0	6	4	35
E2553023	EQ553023	2.3	6	4	35
E2553025	EQ553025	2.5	6	5	36
E2553028	-	2.8	6	5	36
E2553030	EQ553030	3.0	6	5	36
E2553033	EQ553033	3.3	6	6	37
E2553035	-	3.5	6	6	37
E2553038	-	3.8	6	7	38
E2553040	EQ553040	4.0	6	7	38
E2553043	-	4.3	6	7	38
E2553045	-	4.5	6	7	38
E2553048	EQ553048	4.8	6	8	39
E2553050	EQ553050	5.0	6	8	39
E2553053	-	5.3	6	8	39
E2553055	-	5.5	6	8	39
E2553060	EQ553060	6.0	6	8	39
E2553065	EQ553065	6.5	8	10	42
E2553070	EQ553070	7.0	8	10	42

▶ TiN and TiCN Coatings are available on your request.

▶ NEXT PAGE

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

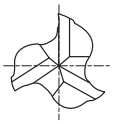
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

GENERAL HSS END MILLS

FLAT SHANK **E2554** SERIES
FLAT SHANK **EQ554** SERIES

HSS Co8, 3 FLUTE LONG LENGTH THROW AWAY

HSS Co8, 3 SCHNEIDEN LANG EINWEGFRÄSER
FRAISE HSS Co8, 3 DENTS À JETER, LONGUE
3 TAGLIENTI, SERIE LUNGA, NON RIAFFILABILE - HSS Co8



HSS Co8 | YG STD | 3 | 30° | FLAT | UNCOATED | TiAlN

p.C726~C733

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN	e8	h6		
E2554015	EQ554015	1.5	6	4	35
E2554020	EQ554020	2.0	6	7	38
-	EQ554025	2.5	6	8	39
E2554030	-	3.0	6	8	39
E2554035	EQ554035	3.5	6	10	41
E2554040	EQ554040	4.0	6	11	42
E2554045	EQ554045	4.5	6	11	42
E2554050	EQ554050	5.0	6	13	44
E2554055	-	5.5	6	13	44
E2554060	-	6.0	6	13	44
E2554065	EQ554065	6.5	8	16	48
E2554070	EQ554070	7.0	8	16	48
E2554075	-	7.5	8	16	48
E2554080	-	8.0	8	19	51
E2554085	-	8.5	10	19	56
E2554090	EQ554090	9.0	10	19	56
E2554095	-	9.5	10	19	56
E2554100	-	10.0	10	22	59

▶ TiN and TiCN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

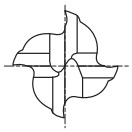
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

GENERAL HSS END MILLS

FLAT SHANK **E2595** SERIES
FLAT SHANK **EQ595** SERIES

HSS Co8, 4 FLUTE SHORT LENGTH - CENTER CUT

HSS Co8, 4&6 SCHNEIDEN KURZ
FRAISE HSS Co8, 4&6 DENTS, COUPE AU CENTRE, COURTE
4 - 6 TAGLIENTI, SERIE CORTA, TAGLIENTE AL CENTRO - HSS Co8



HSS Co8 | DIN 844 | 4 | 30° | DIN 1835B | UNCOATED | TiAlN

p.C742~C745

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiAlN				
E2595020	EQ595020	2.0	6	7	51
E2595030	EQ595030	3.0	6	8	52
E2595040	EQ595040	4.0	6	11	55
E2595050	EQ595050	5.0	6	13	57
E2595060	EQ595060	6.0	6	13	57
E2595070	EQ595070	7.0	10	16	66
E2595080	EQ595080	8.0	10	19	69
E2595090	EQ595090	9.0	10	19	69
E2595100	EQ595100	10.0	10	22	72
E2595110	EQ595110	11.0	12	22	79
E2595120	EQ595120	12.0	12	26	83
E2595130	EQ595130	13.0	12	26	83
E2595140	EQ595140	14.0	12	26	83
E2595150	EQ595150	15.0	12	26	83
E2595160	EQ595160	16.0	16	32	92
E2595170	EQ595170	17.0	16	32	92
E2595180	EQ595180	18.0	16	32	92
E2595190	EQ595190	19.0	16	32	92
E2595920	EQ595920	20.0	16	38	98
E2595200	EQ595200	20.0	20	38	104
E2595220	EQ595220	22.0	20	38	104
E2595250	EQ595250	25.0	25	45	121

▶ Other shank design on your reguest.
▶ TiN and TiCN Coatings are available on your request.

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ + 0.04	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

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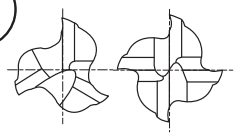
YG-1 CO., LTD.

GENERAL HSS END MILLS

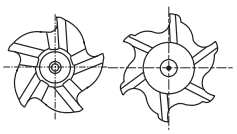
FLAT SHANK **E2753** SERIES
FLAT SHANK **EQ753** SERIES

HSS Co8, MULTI FLUTE SHORT LENGTH ROUGHING - FINE

HSS Co8, MULTI SCHNEIDEN KURZ SCHRUPPFRÄSER - FEIN
FRAISE HSS Co8, MULTI-DENTS ÉBAUCHE, PAS FIN, COURTE
MULTI TAGLIENTE, PER SGROSSATURA, SERIE CORTA, BOMBATO FINE - HSS Co8



Up to Ø20mm



Over Ø20mm

HSS Co8 | DIN 844 | HR | 3-6 | 30° | DIN 1835B | ~Ø20 | Ø25~ | C x 45° | UNCOATED | TiAlN

p.C738~C741

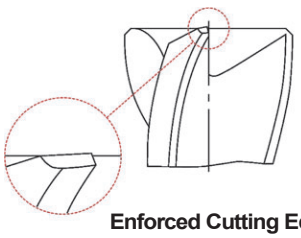
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
UNCOATED	TiAlN	js12	h6				
E2753060	EQ753060	6.0	6	13	57	3	0.18
E2753070	EQ753070	7.0	10	16	66	3	0.18
E2753080	EQ753080	8.0	10	19	69	3	0.18
E2753090	EQ753090	9.0	10	19	69	3	0.18
E2753100	EQ753100	10.0	10	22	72	4	0.18
E2753110	EQ753110	11.0	12	22	79	4	0.18
E2753120	EQ753120	12.0	12	26	83	4	0.18
E2753130	EQ753130	13.0	12	26	83	4	0.18
E2753140	EQ753140	14.0	12	26	83	4	0.25
E2753150	EQ753150	15.0	12	26	83	4	0.25
E2753160	EQ753160	16.0	16	32	92	4	0.25
E2753180	EQ753180	18.0	16	32	92	4	0.25
E2753200	EQ753200	20.0	20	38	104	4	0.25
E2753250	EQ753250	25.0	25	45	121	5	0.36
E2753280	EQ753280	28.0	25	45	121	6	0.36
E2753300	EQ753300	30.0	25	45	121	6	0.36
-	EQ753320	32.0	32	53	133	6	0.51

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	±50	±60	±75	±90	±105	±125
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

GENERAL HSS END MILLS

FLAT SHANK **E2755** SERIES

HSS Co8, 3 FLUTE 37° HELIX SHORT LENGTH ROUGHING for ALUMINUM

HSS Co8, 3 SCHNEIDEN 37° RECHTSSPIRALE KURZ SCHRUPPFRÄSER FÜR ALUMINIUM
FRAISE HSS Co8, 3 DENTS, ÉBAUCHE POUR ALUMINIUM, HÉLICE 37°, COURTE
3 TAGLIENTI, ELICA 37°, PER SGROSSATURA, SERIE CORTA - HSS Co8

for ALUMINUM
für ALUMINIUM

HSS Co8 | DIN 844 | WR | 3 | 37° | DIN 1835B | C x 45° | UNCOATED

p.C746~C747

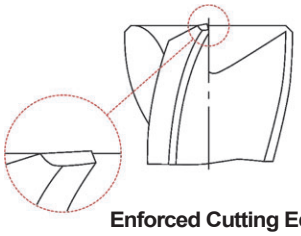
Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
UNCOATED	js12	h6			
E2755060	**6.0**	6	13	57	0.51
E2755080	**8.0**	10	19	69	0.51
E2755100	**10.0**	10	22	72	0.60
E2755120	**12.0**	12	26	83	0.74
E2755140	**14.0**	12	26	83	0.94
E2755160	**16.0**	16	32	92	0.94
E2755180	**18.0**	16	32	92	0.94
E2755200	**20.0**	20	38	104	0.94
E2755220	**22.0**	20	38	104	0.94
E2755250	**25.0**	25	45	121	0.94

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	±50	±60	±75	±90	±105	±125
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	○	○	○	◎	○	○		◎										

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	○																

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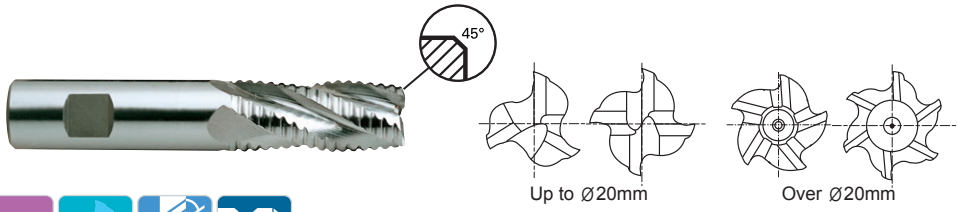
YG-1 CO., LTD.

GENERAL HSS END MILLS

FLAT SHANK **E2751** SERIES
FLAT SHANK **EQ751** SERIES

HSS Co8, MULTI FLUTE SHORT LENGTH ROUGHING - COARSE

HSS Co8, MULTI SCHNEIDEN KURZ SCHRUPPFRÄSER - GROB
FRAISE HSS Co8, MULTI-DENTS ÉBAUCHE, PAS GROSSIER, COURTE
MULTI TAGLIENTE, PER SGROSSATURA, SERIE CORTA, BOMBATO GROSSO - HSS Co8



HSS Co8 | DIN 844 | NR | 3-6 | 30° | DIN 1835B | ~Ø20 | Ø22~ | C x 45° | UNCOATED | TiAlN

p.C738~C741

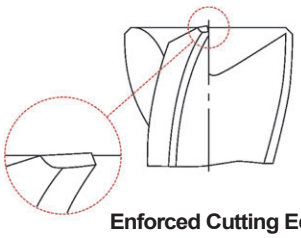
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
UNCOATED	TiAlN	js12	h6				
-	EQ751240	24.0	25	45	121	5	0.55
E2751250	EQ751250	25.0	25	45	121	5	0.55
-	EQ751260	26.0	25	45	121	6	0.55
E2751280	-	28.0	25	45	121	6	0.70
E2751300	EQ751300	30.0	25	45	121	6	0.70
E2751320	EQ751320	32.0	32	53	133	6	0.70
E2751350	-	35.0	32	53	133	6	0.70
E2751360	EQ751360	36.0	32	53	133	6	0.70
E2751400	-	40.0	32	63	155	6	0.88
E2751940	-	40.0	40	63	155	6	0.88
-	EQ751450	45.0	32	63	143	6	0.88
E2751500	-	50.0	50	75	177	6	0.88

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	±50	±60	±75	±90	±105	±125
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16


Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

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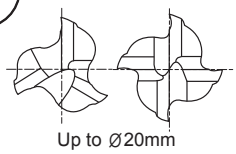
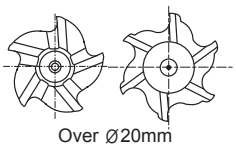
GENERAL HSS END MILLS

FLAT SHANK **E2752** SERIES
FLAT SHANK **EQ752** SERIES

HSS Co8, MULTI FLUTE LONG LENGTH ROUGHING - COARSE

- HSS Co8, MULTI SCHNEIDEN LANG SCHRUPPFRÄSER - GROB
- FRAISE HSS Co8, MULTI-DENTS ÉBAUCHE, PAS GROSSIER, LONGUE
- MULTI TAGLIENTE, PER SGROSSATURA, SERIE LUNGA, BOMBATO GROSSO - HSS Co8


Up to Ø20mm


Over Ø20mm

HSS Co8 | DIN 844 | NR | 3-6 | 30° | DIN 1835B | ~Ø20 | Ø22~ | C x 45° | UNCOATED | TiAlN

p.C738~C741

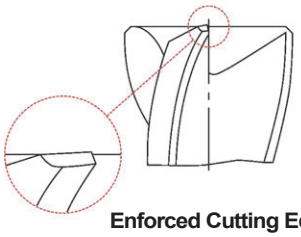
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
UNCOATED	TiAlN	js12	h6				
E2752360	-	**36.0**	32	106	186	6	0.70
E2752938	-	**38.0**	40	125	217	6	0.70
E2752400	-	**40.0**	32	125	217	6	0.88
E2752940	**EQ752940**	**40.0**	40	125	217	6	0.88

▶ Other shank design on your request.
▶ TiN and TiCN Coatings are available on your request.

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛						
Nominal-Diameter in ㎜						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	±50	±60	±75	±90	±105	±125
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16


Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	○	○	○	○	○																

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YG-1 CO., LTD.

GENERAL HSS END MILLS

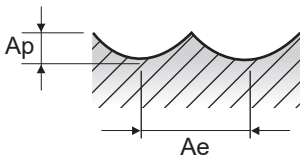
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EQ535, EQ492 SERIES — 2 FLUTE BALL NOSE TiAlN COATED

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1	Non-alloy steel	0.7D	0.3D	Vc	60	55	60	55	55	55	55	55	55
					fz	0.011	0.018	0.031	0.05	0.069	0.086	0.095	0.115	0.129
					RPM	6366	4377	3183	2188	1751	1459	1094	875	700
					FEED	140	158	197	219	242	251	208	201	181
	2		0.7D	0.3D	Vc	45	40	45	45	45	40	45	45	45
					fz	0.011	0.016	0.026	0.043	0.061	0.066	0.082	0.086	0.091
					RPM	4775	3183	2387	1790	1432	1061	895	716	573
					FEED	105	102	124	154	175	140	147	123	104
	3-4		0.7D	0.3D	Vc	25	25	25	25	25	25	25	25	25
					fz	0.007	0.013	0.023	0.035	0.053	0.058	0.075	0.088	0.092
					RPM	2653	1989	1326	995	796	663	497	398	318
					FEED	37	52	61	70	84	77	75	70	59
	5		0.7D	0.3D	Vc	20	20	20	20	15	15	20	20	15
					fz	0.008	0.013	0.018	0.029	0.045	0.056	0.071	0.083	0.1
					RPM	2122	1592	1061	796	477	398	398	318	191
					FEED	34	41	38	46	43	45	57	53	38
	6	Low alloy steel	0.7D	0.3D	Vc	45	40	45	45	45	40	45	45	45
					fz	0.011	0.016	0.026	0.043	0.061	0.066	0.082	0.086	0.091
					RPM	4775	3183	2387	1790	1432	1061	895	716	573
					FEED	105	102	124	154	175	140	147	123	104
	7		0.7D	0.3D	Vc	25	25	25	25	25	25	25	25	25
					fz	0.007	0.013	0.023	0.035	0.053	0.058	0.075	0.088	0.092
					RPM	2653	1989	1326	995	796	663	497	398	318
					FEED	37	52	61	70	84	77	75	70	59
	8-9		0.7D	0.3D	Vc	20	20	20	20	15	15	20	20	15
					fz	0.008	0.013	0.018	0.029	0.045	0.056	0.071	0.083	0.1
					RPM	2122	1592	1061	796	477	398	398	318	191
					FEED	34	41	38	46	43	45	57	53	38
	10	High alloyed steel, and tool steel	0.7D	0.3D	Vc	45	40	45	45	45	40	45	45	45
					fz	0.011	0.016	0.026	0.043	0.061	0.066	0.082	0.086	0.091
					RPM	4775	3183	2387	1790	1432	1061	895	716	573
					FEED	105	102	124	154	175	140	147	123	104
	11.1		0.7D	0.3D	Vc	20	20	20	20	15	15	20	20	15
					fz	0.008	0.013	0.018	0.029	0.045	0.056	0.071	0.083	0.1
					RPM	2122	1592	1061	796	477	398	398	318	191
					FEED	34	41	38	46	43	45	57	53	38
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	Vc	145	140	150	140	140	130	140	140	140
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.087	0.097
					RPM	15385	11141	7958	5570	4456	3448	2785	2228	1783
					FEED	308	357	398	490	499	469	418	388	346
	23-24	Aluminum-cast, alloyed	0.7D	0.3D	Vc	94	91	98	91	91	85	91	91	91
					fz	0.01	0.016	0.025	0.044	0.056	0.068	0.075	0.087	0.097
					RPM	9974	7242	5199	3621	2897	2255	1810	1448	1159
					FEED	199	232	260	319	324	307	272	252	225

※The FEED, in long & extra long types, should be reduced by around 50%



CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
JET-POWER END MILLS
V7 PLUS END MILLS
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
CRX S END MILLS
K-2 END MILLS
ONLY ONE COATED PM60 END MILLS
TANK POWER END MILLS
GENERAL HSS END MILLS
MILLING CUTTERS

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2570, E2571, E2510 SERIES — 2 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	35	35	35	35	35	35	35	35
					fz	0.004	0.008	0.013	0.02	0.025	0.036	0.045	0.061
					RPM	5570	3714	2785	2228	1857	1393	1114	928
					FEED	45	59	72	89	93	100	100	113
	2		1.0D	0.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.05	0.063
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	29	45	62	73	80	98	95	100
	3-4		1.0D	0.5D	Vc	25	25	25	25	25	25	25	25
					fz	0.004	0.008	0.013	0.019	0.025	0.039	0.05	0.063
					RPM	3979	2653	1989	1592	1326	995	796	663
					FEED	32	42	52	60	66	78	80	84
	5		1.0D	0.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.04	0.05	0.063
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	19	33	36	40	48	48	50
	6	Low alloy steel	1.0D	0.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.05	0.063
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	29	45	62	73	80	98	95	100
	7		1.0D	0.5D	Vc	25	25	25	25	25	25	25	25
					fz	0.004	0.008	0.013	0.019	0.025	0.039	0.05	0.063
					RPM	3979	2653	1989	1592	1326	995	796	663
					FEED	32	42	52	60	66	78	80	84
	8-9		1.0D	0.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.04	0.05	0.063
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	19	33	36	40	48	48	50
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.003	0.007	0.013	0.019	0.025	0.041	0.05	0.063
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	29	45	62	73	80	98	95	100
	11.1		1.0D	0.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.003	0.006	0.014	0.019	0.025	0.04	0.05	0.063
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	19	33	36	40	48	48	50
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	Vc	75	105	100	100	105	100	95	95
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076
					RPM	11937	11141	7958	6366	5570	3979	3024	2520
					FEED	167	245	286	318	312	390	393	383
	23-24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	49	68	65	65	68	65	62	62
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.065	0.076
					RPM	7799	7215	5173	4138	3608	2586	1974	1645
					FEED	109	159	186	207	202	253	257	250

※The FEED, in long & extra long types, should be reduced by around 50%

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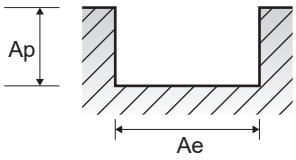

CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
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ONLY ONE COATED PM60 END MILLS
TANK POWER END MILLS
GENERAL HSS END MILLS
MILLING CUTTERS

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EQ570, EQ571, EQ510 SERIES — 2 FLUTE TiALN COATED - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	50	45	50	50	45	50	50	45
					fz	0.004	0.008	0.013	0.02	0.025	0.036	0.045	0.062
					RPM	7958	4775	3979	3183	2387	1989	1592	1194
					FEED	64	76	103	127	119	143	143	148
	2		1.0D	0.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.007	0.012	0.02	0.024	0.04	0.05	0.064
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	38	59	76	102	102	127	127	136
	3-4		1.0D	0.5D	Vc	35	35	30	35	30	30	35	35
					fz	0.004	0.008	0.013	0.019	0.025	0.04	0.05	0.061
					RPM	5570	3714	2387	2228	1592	1194	1114	928
					FEED	45	59	62	85	80	95	111	113
	5		1.0D	0.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.013	0.02	0.025	0.041	0.05	0.064
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	30	41	51	53	65	64	68
	6	Low alloy steel	1.0D	0.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.007	0.012	0.02	0.024	0.04	0.05	0.064
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	38	59	76	102	102	127	127	136
	7		1.0D	0.5D	Vc	35	35	30	35	30	30	35	35
					fz	0.004	0.008	0.013	0.019	0.025	0.04	0.05	0.061
					RPM	5570	3714	2387	2228	1592	1194	1114	928
					FEED	45	59	62	85	80	95	111	113
	8-9		1.0D	0.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.013	0.02	0.025	0.041	0.05	0.064
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	30	41	51	53	65	64	68
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.007	0.012	0.02	0.024	0.04	0.05	0.064
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	38	59	76	102	102	127	127	136
	11.1		1.0D	0.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.003	0.007	0.013	0.02	0.025	0.041	0.05	0.064
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	30	41	51	53	65	64	68
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	Vc	105	145	140	140	150	140	135	130
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.064	0.076
					RPM	16711	15385	11141	8913	7958	5570	4297	3448
					FEED	234	338	401	446	446	546	550	524
	23-24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	68	94	91	91	98	91	88	85
					fz	0.007	0.011	0.018	0.025	0.028	0.049	0.064	0.076
					RPM	10823	9974	7242	5793	5199	3621	2801	2255
					FEED	152	219	261	290	291	355	359	343

※The FEED, in long & extra long types, should be reduced by around 50%

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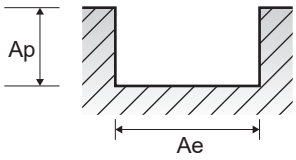

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2572, E2573, E2516, E2553, E2554 SERIES

3 FLUTE - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	35	35	35	35	35	35	35	35
					fz	0.002	0.005	0.007	0.012	0.015	0.021	0.027	0.037
					RPM	5570	3714	2785	2228	1857	1393	1114	928
					FEED	33	56	58	80	84	88	90	103
	2		1.0D	0.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.002	0.004	0.007	0.01	0.014	0.021	0.026	0.033
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	29	38	50	57	67	75	74	79
	3-4		1.0D	0.5D	Vc	25	25	25	25	25	25	25	25
					fz	0.002	0.003	0.006	0.008	0.011	0.019	0.023	0.029
					RPM	3979	2653	1989	1592	1326	995	796	663
					FEED	24	24	36	38	44	57	55	58
	5		1.0D	0.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.002	0.003	0.006	0.007	0.01	0.018	0.022	0.029
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	14	21	20	24	32	32	35
	6	Low alloy steel	1.0D	0.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.002	0.004	0.007	0.01	0.014	0.021	0.026	0.033
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	29	38	50	57	67	75	74	79
	7		1.0D	0.5D	Vc	25	25	25	25	25	25	25	25
					fz	0.002	0.003	0.006	0.008	0.011	0.019	0.023	0.029
					RPM	3979	2653	1989	1592	1326	995	796	663
					FEED	24	24	36	38	44	57	55	58
	8-9		1.0D	0.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.002	0.003	0.006	0.007	0.01	0.018	0.022	0.029
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	14	21	20	24	32	32	35
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.002	0.004	0.007	0.01	0.014	0.021	0.026	0.033
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	29	38	50	57	67	75	74	79
	11.1		1.0D	0.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.002	0.003	0.006	0.007	0.01	0.018	0.022	0.029
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	14	21	20	24	32	32	35
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	Vc	75	105	100	100	105	100	95	95
					fz	0.003	0.005	0.008	0.011	0.013	0.022	0.029	0.035
					RPM	11937	11141	7958	6366	5570	3979	3024	2520
					FEED	107	167	191	210	217	263	263	265
	23-24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	49	68	65	65	68	65	62	62
					fz	0.003	0.005	0.008	0.011	0.013	0.022	0.029	0.035
					RPM	7799	7215	5173	4138	3608	2586	1974	1645
					FEED	70	108	124	137	141	171	172	173

※The FEED, in long & extra long types, should be reduced by around 50%

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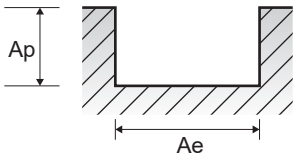

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2572, E2573, E2516, E2553, E2554 SERIES

3 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	35	35	35	35	35	35	35	35
					fz	0.004	0.008	0.013	0.02	0.025	0.036	0.045	0.061
					RPM	5570	3714	2785	2228	1857	1393	1114	928
					FEED	67	89	109	134	139	150	150	170
	2		0.1D	1.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.044	0.056
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	43	57	79	103	110	129	126	134
	3-4		0.1D	1.5D	Vc	25	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.018	0.03	0.038	0.048
					RPM	3979	2653	1989	1592	1326	995	796	663
					FEED	36	48	54	67	72	90	91	95
	5		0.1D	1.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.002	0.004	0.009	0.013	0.019	0.03	0.037	0.046
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	19	32	37	45	54	53	55
	6	Low alloy steel	0.1D	1.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.044	0.056
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	43	57	79	103	110	129	126	134
	7		0.1D	1.5D	Vc	25	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.018	0.03	0.038	0.048
					RPM	3979	2653	1989	1592	1326	995	796	663
					FEED	36	48	54	67	72	90	91	95
	8-9		0.1D	1.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.002	0.004	0.009	0.013	0.019	0.03	0.037	0.046
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	19	32	37	45	54	53	55
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	30	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.044	0.056
					RPM	4775	3183	2387	1910	1592	1194	955	796
					FEED	43	57	79	103	110	129	126	134
	11.1		0.1D	1.5D	Vc	15	15	15	15	15	15	15	15
					fz	0.002	0.004	0.009	0.013	0.019	0.03	0.037	0.046
					RPM	2387	1592	1194	955	796	597	477	398
					FEED	14	19	32	37	45	54	53	55
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	Vc	75	105	100	100	105	100	95	95
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.048	0.057
					RPM	11937	11141	7958	6366	5570	3979	3024	2520
					FEED	179	267	334	363	351	442	435	431
	23-24	Aluminum-cast, alloyed	0.1D	1.5D	Vc	49	68	65	65	68	65	62	62
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.048	0.057
					RPM	7799	7215	5173	4138	3608	2586	1974	1645
					FEED	117	173	217	236	227	287	284	281

※The FEED, in long & extra long types, should be reduced by around 50%

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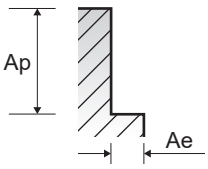

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EQ572, EQ573, EQ516, EQ553, EQ554 SERIES

3 FLUTE TiAlN COATED - SLOTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1	Non-alloy steel	1.0D	0.5D	Vc	50	45	50	50	45	50	45	50
					fz	0.002	0.005	0.007	0.012	0.015	0.021	0.028	0.036
					RPM	7958	4775	3979	3183	2387	1989	1432	1326
					FEED	48	72	84	115	107	125	120	143
	2		1.0D	0.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.002	0.004	0.006	0.01	0.014	0.022	0.028	0.033
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	38	51	57	76	89	105	107	105
	3-4		1.0D	0.5D	Vc	35	35	30	35	30	35	35	35
					fz	0.002	0.003	0.005	0.008	0.011	0.018	0.023	0.028
					RPM	5570	3714	2387	2228	1592	1393	1114	928
					FEED	33	33	36	53	53	75	77	78
	5		1.0D	0.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.003	0.007	0.008	0.011	0.017	0.021	0.03
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	19	33	31	35	41	40	48
	6	Low alloy steel	1.0D	0.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.002	0.004	0.006	0.01	0.014	0.022	0.028	0.033
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	38	51	57	76	89	105	107	105
	7		1.0D	0.5D	Vc	35	35	30	35	30	35	35	35
					fz	0.002	0.003	0.005	0.008	0.011	0.018	0.023	0.028
					RPM	5570	3714	2387	2228	1592	1393	1114	928
					FEED	33	33	36	53	53	75	77	78
	8-9		1.0D	0.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.003	0.007	0.008	0.011	0.017	0.021	0.03
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	19	33	31	35	41	40	48
	10	High alloyed steel, and tool steel	1.0D	0.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.002	0.004	0.006	0.01	0.014	0.022	0.028	0.033
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	38	51	57	76	89	105	107	105
	11.1		1.0D	0.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.003	0.007	0.008	0.011	0.017	0.021	0.03
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	19	33	31	35	41	40	48
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	Vc	105	145	140	140	145	140	135	130
					fz	0.003	0.005	0.008	0.011	0.012	0.021	0.029	0.034
					RPM	16711	15385	11141	8913	7692	5570	4297	3448
					FEED	150	231	267	294	277	351	374	352
	23-24	Aluminum-cast, alloyed	1.0D	0.5D	Vc	68	94	91	91	94	91	88	85
					fz	0.003	0.005	0.008	0.011	0.012	0.021	0.029	0.034
					RPM	10823	9974	7242	5793	4987	3621	2801	2255
					FEED	97	150	174	191	180	228	244	230

※The FEED, in long & extra long types, should be reduced by around 50%

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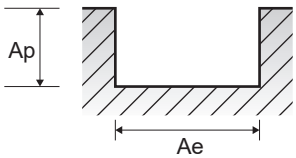

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EQ572, EQ573, EQ516, EQ553, EQ554 SERIES

3 FLUTE TiAlN COATED - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	50	45	50	50	45	50	45	50
					fz	0.004	0.007	0.012	0.02	0.025	0.035	0.047	0.059
					RPM	7958	4775	3979	3183	2387	1989	1432	1326
					FEED	95	100	143	191	179	209	202	235
	2		0.1D	1.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.017	0.023	0.038	0.044	0.058
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	57	76	105	130	146	181	168	185
	3-4		0.1D	1.5D	Vc	35	35	30	35	30	35	35	35
					fz	0.003	0.006	0.009	0.014	0.018	0.028	0.038	0.047
					RPM	5570	3714	2387	2228	1592	1393	1114	928
					FEED	50	67	64	94	86	117	127	131
	5		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.005	0.009	0.013	0.018	0.03	0.037	0.045
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	32	43	50	57	72	71	72
	6	Low alloy steel	0.1D	1.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.017	0.023	0.038	0.044	0.058
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	57	76	105	130	146	181	168	185
	7		0.1D	1.5D	Vc	35	35	30	35	30	35	35	35
					fz	0.003	0.006	0.009	0.014	0.018	0.028	0.038	0.047
					RPM	5570	3714	2387	2228	1592	1393	1114	928
					FEED	50	67	64	94	86	117	127	131
	8-9		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.005	0.009	0.013	0.018	0.03	0.037	0.045
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	32	43	50	57	72	71	72
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.017	0.023	0.038	0.044	0.058
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	57	76	105	130	146	181	168	185
	11.1		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.005	0.009	0.013	0.018	0.03	0.037	0.045
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	19	32	43	50	57	72	71	72
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	Vc	105	145	140	140	145	140	135	130
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.049	0.057
					RPM	16711	15385	11141	8913	7692	5570	4297	3448
					FEED	251	369	468	508	485	618	632	590
	23-24	Aluminum-cast, alloyed	0.1D	1.5D	Vc	68	94	91	91	94	91	88	85
					fz	0.005	0.008	0.014	0.019	0.021	0.037	0.049	0.057
					RPM	10823	9974	7242	5793	4987	3621	2801	2255
					FEED	162	239	304	330	314	402	412	386

※The FEED, in long & extra long types, should be reduced by around 50%

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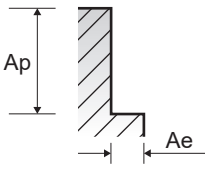

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2574, E2597 SERIES — 4 FLUTE - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	35	35	35	35	35	35	35
					fz	0.004	0.008	0.013	0.02	0.025	0.036	0.045
					RPM	5570	3714	2785	2228	1857	1393	1114
					FEED	89	119	145	178	186	201	201
	2		0.1D	1.5D	Vc	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044
					RPM	4775	3183	2387	1910	1592	1194	955
					FEED	57	76	105	130	146	172	168
	3-4		0.1D	1.5D	Vc	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038
					RPM	3979	2653	1989	1592	1326	995	796
					FEED	48	64	72	89	101	115	121
	5		0.1D	1.5D	Vc	15	15	15	15	15	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036
					RPM	2387	1592	1194	955	796	597	477
					FEED	19	32	48	53	60	69	69
	6	Low alloy steel	0.1D	1.5D	Vc	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044
					RPM	4775	3183	2387	1910	1592	1194	955
					FEED	57	76	105	130	146	172	168
	7		0.1D	1.5D	Vc	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038
					RPM	3979	2653	1989	1592	1326	995	796
					FEED	48	64	72	89	101	115	121
	8-9		0.1D	1.5D	Vc	15	15	15	15	15	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036
					RPM	2387	1592	1194	955	796	597	477
					FEED	19	32	48	53	60	69	69
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044
					RPM	4775	3183	2387	1910	1592	1194	955
					FEED	57	76	105	130	146	172	168
	11.1		0.1D	1.5D	Vc	15	15	15	15	15	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036
					RPM	2387	1592	1194	955	796	597	477
					FEED	19	32	48	53	60	69	69
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	Vc	75	105	100	100	105	100	95
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048
					RPM	11937	11141	7958	6366	5570	3979	3024
					FEED	239	401	446	484	468	573	581
	23-24	Aluminum-cast, alloyed	0.1D	1.5D	Vc	49	68	65	65	68	65	62
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048
					RPM	7799	7215	5173	4138	3608	2586	1974
					FEED	156	260	290	314	303	372	379

※The FEED, in long & extra long types, should be reduced by around 50%

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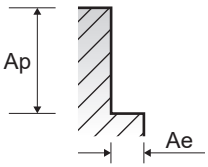

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EQ574, EQ597 SERIES — 4 FLUTE TiAlN COATED - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	50	45	50	50	45	50	50	45
					fz	0.004	0.008	0.013	0.02	0.025	0.036	0.045	0.062
					RPM	7958	4775	3979	3183	2387	1989	1592	1194
					FEED	127	153	207	255	239	286	286	296
	2		0.1D	1.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045	0.057
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	76	102	140	183	195	229	229	242
	3-4		0.1D	1.5D	Vc	35	35	30	35	30	30	35	35
					fz	0.003	0.006	0.009	0.014	0.018	0.029	0.039	0.047
					RPM	5570	3714	2387	2228	1592	1194	1114	928
					FEED	67	89	86	125	115	138	174	175
	5		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.004	0.01	0.014	0.019	0.028	0.035	0.048
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	25	34	64	71	81	89	89	102
	6	Low alloy steel	0.1D	1.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045	0.057
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	76	102	140	183	195	229	229	242
	7		0.1D	1.5D	Vc	35	35	30	35	30	30	35	35
					fz	0.003	0.006	0.009	0.014	0.018	0.029	0.039	0.047
					RPM	5570	3714	2387	2228	1592	1194	1114	928
					FEED	67	89	86	125	115	138	174	175
	8-9		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.004	0.01	0.014	0.019	0.028	0.035	0.048
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	25	34	64	71	81	89	89	102
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	40	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045	0.057
					RPM	6366	4244	3183	2546	2122	1592	1273	1061
					FEED	76	102	140	183	195	229	229	242
	11.1		0.1D	1.5D	Vc	20	20	20	20	20	20	20	20
					fz	0.002	0.004	0.01	0.014	0.019	0.028	0.035	0.048
					RPM	3183	2122	1592	1273	1061	796	637	531
					FEED	25	34	64	71	81	89	89	102
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	Vc	105	145	140	140	150	140	135	130
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057
					RPM	16711	15385	11141	8913	7958	5570	4297	3448
					FEED	334	554	624	677	668	802	825	786
	23-24	Aluminum-cast, alloyed	0.1D	1.5D	Vc	68	94	91	91	98	91	88	85
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048	0.057
					RPM	10823	9974	7242	5793	5199	3621	2801	2255
					FEED	216	359	406	440	437	521	538	514

※ The FEED, in long & extra long types, should be reduced by around 50%

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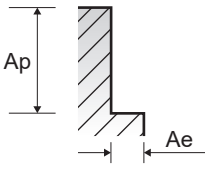

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2753, E2762, E2751, E2752 SERIES

MULTI FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	35	35	35	35	35	35
					fz	0.015	0.025	0.034	0.05	0.056	0.064
					RPM	1857	1393	1114	928	796	696
					FEED	84	104	152	186	178	178
	2		0.5D	1.5D	Vc	30	30	30	30	30	30
					fz	0.013	0.023	0.033	0.044	0.05	0.063
					RPM	1592	1194	955	796	682	597
					FEED	62	82	126	140	136	150
	3-4		0.5D	1.5D	Vc	25	25	25	25	25	25
					fz	0.015	0.024	0.034	0.044	0.049	0.061
					RPM	1326	995	796	663	568	497
					FEED	60	72	108	117	111	121
	5		0.5D	1.5D	Vc	15	15	15	15	15	15
					fz	0.013	0.021	0.033	0.044	0.05	0.063
					RPM	796	597	477	398	341	298
					FEED	31	38	63	70	68	75
	6	Low alloy steel	0.5D	1.5D	Vc	30	30	30	30	30	30
					fz	0.013	0.023	0.033	0.044	0.05	0.063
					RPM	1592	1194	955	796	682	597
					FEED	62	82	126	140	136	150
	7		0.5D	1.5D	Vc	25	25	25	25	25	25
					fz	0.015	0.024	0.034	0.044	0.049	0.061
					RPM	1326	995	796	663	568	497
					FEED	60	72	108	117	111	121
	8-9		0.5D	1.5D	Vc	15	15	15	15	15	15
					fz	0.013	0.021	0.033	0.044	0.05	0.063
					RPM	796	597	477	398	341	298
					FEED	31	38	63	70	68	75
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	30	30	30	30	30	30
					fz	0.013	0.023	0.033	0.044	0.05	0.063
					RPM	1592	1194	955	796	682	597
					FEED	62	82	126	140	136	150
	11.1		0.5D	1.5D	Vc	15	15	15	15	15	15
					fz	0.013	0.021	0.033	0.044	0.05	0.063
					RPM	796	597	477	398	341	298
					FEED	31	38	63	70	68	75
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	Vc	85	80	80	75	80	80
					fz	0.015	0.025	0.035	0.05	0.058	0.07
					RPM	4509	3183	2546	1989	1819	1592
					FEED	203	239	357	398	422	446
	23-24	Aluminum-cast, alloyed	0.5D	1.5D	Vc	55	52	52	49	52	52
					fz	0.015	0.025	0.035	0.05	0.058	0.07
					RPM	2918	2069	1655	1300	1182	1035
					FEED	131	155	232	260	274	290

※ The FEED, in long & extra long types, should be reduced by around 50%

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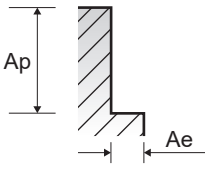

CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER END MILLS
JET-POWER END MILLS
V7 PLUS END MILLS
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
CRX S END MILLS
K-2 END MILLS
ONLY ONE COATED PM60 END MILLS
TANK POWER END MILLS
GENERAL HSS END MILLS
MILLING CUTTERS

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EQ753, EQ762, EQ751, EQ752 SERIES

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

MULTI FLUTE ROUGHING TiAlN COATED - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	45	50	50	45	50	50
					fz	0.015	0.025	0.034	0.05	0.057	0.063
					RPM	2387	1989	1592	1194	1137	995
					FEED	107	149	216	239	259	251
	2		0.5D	1.5D	Vc	40	40	40	40	45	40
					fz	0.013	0.023	0.034	0.044	0.049	0.061
					RPM	2122	1592	1273	1061	1023	796
					FEED	83	110	173	187	201	194
	3-4		0.5D	1.5D	Vc	30	30	35	35	35	35
					fz	0.015	0.024	0.035	0.043	0.048	0.06
					RPM	1592	1194	1114	928	796	696
					FEED	72	86	156	160	153	167
	5		0.5D	1.5D	Vc	20	20	20	20	20	20
					fz	0.012	0.021	0.033	0.045	0.05	0.063
					RPM	1061	796	637	531	455	398
					FEED	38	50	84	95	91	100
	6	Low alloy steel	0.5D	1.5D	Vc	40	40	40	40	45	40
					fz	0.013	0.023	0.034	0.044	0.049	0.061
					RPM	2122	1592	1273	1061	1023	796
					FEED	83	110	173	187	201	194
	7		0.5D	1.5D	Vc	30	30	35	35	35	35
					fz	0.015	0.024	0.035	0.043	0.048	0.06
					RPM	1592	1194	1114	928	796	696
					FEED	72	86	156	160	153	167
	8-9		0.5D	1.5D	Vc	20	20	20	20	20	20
					fz	0.012	0.021	0.033	0.045	0.05	0.063
					RPM	1061	796	637	531	455	398
					FEED	38	50	84	95	91	100
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	40	40	40	40	45	40
					fz	0.013	0.023	0.034	0.044	0.049	0.061
					RPM	2122	1592	1273	1061	1023	796
					FEED	83	110	173	187	201	194
	11.1		0.5D	1.5D	Vc	20	20	20	20	20	20
					fz	0.012	0.021	0.033	0.045	0.05	0.063
					RPM	1061	796	637	531	455	398
					FEED	38	50	84	95	91	100
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	Vc	120	110	110	105	110	115
					fz	0.015	0.025	0.035	0.05	0.059	0.07
					RPM	6366	4377	3501	2785	2501	2288
					FEED	286	328	490	557	590	641
	23-24	Aluminum-cast, alloyed	0.5D	1.5D	Vc	78	72	72	68	72	75
					fz	0.015	0.025	0.035	0.05	0.059	0.07
					RPM	4138	2865	2292	1804	1637	1492
					FEED	186	215	321	361	386	418

※ The FEED, in long & extra long types, should be reduced by around 50%

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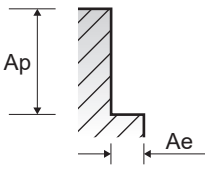

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2595 SERIES — **4FLUTE - SIDE CUTTING**

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	35	35	35	35	35	35	35
					fz	0.004	0.008	0.013	0.02	0.025	0.036	0.045
					RPM	5570	3714	2785	2228	1857	1393	1114
					FEED	89	119	145	178	186	201	201
	2		0.1D	1.5D	Vc	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044
					RPM	4775	3183	2387	1910	1592	1194	955
					FEED	57	76	105	130	146	172	168
	3-4		0.1D	1.5D	Vc	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038
					RPM	3979	2653	1989	1592	1326	995	796
					FEED	48	64	72	89	101	115	121
	5		0.1D	1.5D	Vc	15	15	15	15	15	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036
					RPM	2387	1592	1194	955	796	597	477
					FEED	19	32	48	53	60	69	69
	6	Low alloy steel	0.1D	1.5D	Vc	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044
					RPM	4775	3183	2387	1910	1592	1194	955
					FEED	57	76	105	130	146	172	168
	7		0.1D	1.5D	Vc	25	25	25	25	25	25	25
					fz	0.003	0.006	0.009	0.014	0.019	0.029	0.038
					RPM	3979	2653	1989	1592	1326	995	796
					FEED	48	64	72	89	101	115	121
	8-9		0.1D	1.5D	Vc	15	15	15	15	15	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036
					RPM	2387	1592	1194	955	796	597	477
					FEED	19	32	48	53	60	69	69
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	30	30	30	30	30	30	30
					fz	0.003	0.006	0.011	0.017	0.023	0.036	0.044
					RPM	4775	3183	2387	1910	1592	1194	955
					FEED	57	76	105	130	146	172	168
	11.1		0.1D	1.5D	Vc	15	15	15	15	15	15	15
					fz	0.002	0.005	0.01	0.014	0.019	0.029	0.036
					RPM	2387	1592	1194	955	796	597	477
					FEED	19	32	48	53	60	69	69
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	Vc	75	105	100	100	105	100	95
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048
					RPM	11937	11141	7958	6366	5570	3979	3024
					FEED	239	401	446	484	468	573	581
	23-24	Aluminum-cast, alloyed	0.1D	1.5D	Vc	49	68	65	65	68	65	62
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048
					RPM	7799	7215	5173	4138	3608	2586	1974
					FEED	156	260	290	314	303	372	379

※ The FEED, in long & extra long types, should be reduced by around 50%

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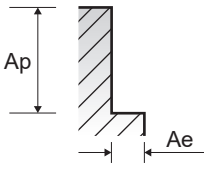

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

EQ595 SERIES — 4 FLUTE TiAlN COATED - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0
P	1	Non-alloy steel	0.1D	1.5D	Vc	50	45	50	50	45	50	50
					fz	0.004	0.008	0.013	0.02	0.025	0.036	0.045
					RPM	7958	4775	3979	3183	2387	1989	1592
					FEED	127	153	207	255	239	286	286
	2		0.1D	1.5D	Vc	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045
					RPM	6366	4244	3183	2546	2122	1592	1273
					FEED	76	102	140	183	195	229	229
	3-4		0.1D	1.5D	Vc	35	35	30	35	30	30	35
					fz	0.003	0.006	0.009	0.014	0.018	0.029	0.039
					RPM	5570	3714	2387	2228	1592	1194	1114
					FEED	67	89	86	125	115	138	174
	5		0.1D	1.5D	Vc	20	20	20	20	20	20	20
					fz	0.002	0.004	0.01	0.014	0.019	0.028	0.035
					RPM	3183	2122	1592	1273	1061	796	637
					FEED	25	34	64	71	81	89	89
	6	Low alloy steel	0.1D	1.5D	Vc	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045
					RPM	6366	4244	3183	2546	2122	1592	1273
					FEED	76	102	140	183	195	229	229
	7		0.1D	1.5D	Vc	35	35	30	35	30	30	35
					fz	0.003	0.006	0.009	0.014	0.018	0.029	0.039
					RPM	5570	3714	2387	2228	1592	1194	1114
					FEED	67	89	86	125	115	138	174
	8-9		0.1D	1.5D	Vc	20	20	20	20	20	20	20
					fz	0.002	0.004	0.01	0.014	0.019	0.028	0.035
					RPM	3183	2122	1592	1273	1061	796	637
					FEED	25	34	64	71	81	89	89
	10	High alloyed steel, and tool steel	0.1D	1.5D	Vc	40	40	40	40	40	40	40
					fz	0.003	0.006	0.011	0.018	0.023	0.036	0.045
					RPM	6366	4244	3183	2546	2122	1592	1273
					FEED	76	102	140	183	195	229	229
	11.1		0.1D	1.5D	Vc	20	20	20	20	20	20	20
					fz	0.002	0.004	0.01	0.014	0.019	0.028	0.035
					RPM	3183	2122	1592	1273	1061	796	637
					FEED	25	34	64	71	81	89	89
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	Vc	105	145	140	140	150	140	135
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048
					RPM	16711	15385	11141	8913	7958	5570	4297
					FEED	334	554	624	677	668	802	825
	23-24	Aluminum-cast, alloyed	0.1D	1.5D	Vc	68	94	91	91	98	91	88
					fz	0.005	0.009	0.014	0.019	0.021	0.036	0.048
					RPM	10823	9974	7242	5793	5199	3621	2801
					FEED	216	359	406	440	437	521	538

※ The FEED, in long & extra long types, should be reduced by around 50%

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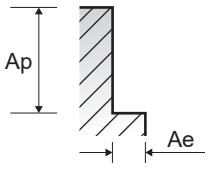

GENERAL HSS END MILLS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2755 SERIES — 3 FLUTE ROUGHING - SIDE CUTTING

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0
P	1	Non-alloy steel	0.5D	1.5D	Vc	35	35	35	35
					fz	0.015	0.025	0.045	0.067
					RPM	1857	1393	1114	928
					FEED	84	104	150	187
	2		0.5D	1.5D	Vc	30	30	30	30
					fz	0.013	0.023	0.044	0.058
					RPM	1592	1194	955	796
					FEED	62	82	126	138
	3-4		0.5D	1.5D	Vc	25	25	25	25
					fz	0.015	0.024	0.046	0.058
					RPM	1326	995	796	663
					FEED	60	72	110	115
	5		0.5D	1.5D	Vc	15	15	15	15
					fz	0.013	0.021	0.044	0.058
					RPM	796	597	477	398
					FEED	31	38	63	69
	6	Low alloy steel	0.5D	1.5D	Vc	30	30	30	30
					fz	0.013	0.023	0.044	0.058
					RPM	1592	1194	955	796
					FEED	62	82	126	138
	7		0.5D	1.5D	Vc	25	25	25	25
					fz	0.015	0.024	0.046	0.058
					RPM	1326	995	796	663
					FEED	60	72	110	115
	8-9		0.5D	1.5D	Vc	15	15	15	15
					fz	0.013	0.021	0.044	0.058
					RPM	796	597	477	398
					FEED	31	38	63	69
	10	High alloyed steel, and tool steel	0.5D	1.5D	Vc	30	30	30	30
					fz	0.013	0.023	0.044	0.058
					RPM	1592	1194	955	796
					FEED	62	82	126	138
	11.1		0.5D	1.5D	Vc	15	15	15	15
					fz	0.013	0.021	0.044	0.058
					RPM	796	597	477	398
					FEED	31	38	63	69
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	Vc	85	80	80	75
					fz	0.015	0.025	0.047	0.067
					RPM	4509	3183	2546	1989
					FEED	203	239	359	400
	23-24	Aluminum-cast, alloyed	0.5D	1.5D	Vc	55	52	52	49
					fz	0.015	0.025	0.047	0.067
					RPM	2918	2069	1655	1300
					FEED	131	155	233	261

※ The FEED, in long & extra long types, should be reduced by around 50%

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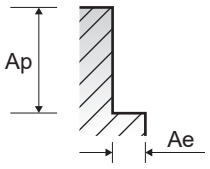
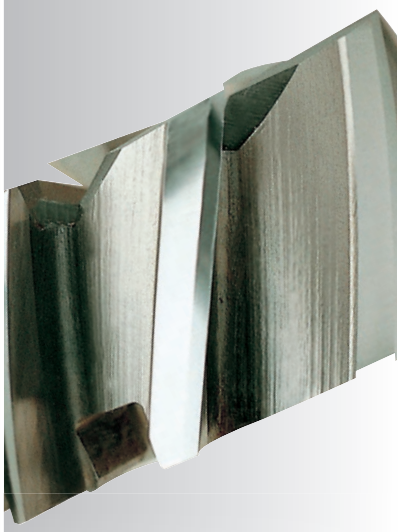


Global Cutting Tool Leader **YG-1**

MILLING

YG

Leading Through Innovation



HSS

MILLING CUTTERS

HSS Fräser

- General Works. Available Dovetail, Woodruff Keyseat, T-slot, Side Milling Cutters and HSS (8% cobalt) Corner Rounding, Shell End Mills

- Allgemeine Arbeiten. Verfügbare Schwalbenschwanz, Passfedernut, T-Nut, Scheibenfräser, Scheibenfräser und HSS (8% Kobalt) Eckenverrundung, Walzenstirnfräser

SELECTION GUIDE

YG MILLING TOOLS

HSS MILLING CUTTERS

General Works. Available Dovetail, Woodruff Keyseat, T-slot, Side Milling Cutters and HSS (8% cobalt) Corner Rounding, Shell End Mills

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C768

SERIES	ML012, ML022 ML112, ML122	ML032, ML042 ML132, ML142	ML062 ML162
CUTTING EDGE SHAPE	DOVETAIL CUTTERS	DOVETAIL CUTTERS	WOODRUFF KEYSEAT CUTTERS
FLUTE	Multi Flute	Multi Flute	Multi Flute
HELIX ANGLE	0°	0°	10°~12°
SIZE MIN	D16.0	D16.0	D10.5
SIZE MAX	D50.0	D38.0	D45.5
PAGE	C752	C753	C754
	Type A, C, E	Type B, D, F	Type B, D, F
	Uncoated	Uncoated	Uncoated
	HSS-E	HSS-E	HSS-E

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎
	11			Quenched & Tempered	325	35	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10			
	16		Pearlitic (Martensitic)		260	26			
	17	Nodular cast iron	Ferritic		160	3			
	18		Pearlitic		250	25			
	19	Malleable cast iron	Ferritic		130				
	20		Pearlitic		230	21			
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○
	22		Curable	Hardened	100		○	○	○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○
	24		≤ 12% Si, Curable	Hardened	90		○	○	○
	25		> 12% Si, Not Curable		130		○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

MILLING CUTTERS

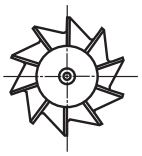
PLAIN SHANK **ML012, ML022 SERIES**
FLAT SHANK **ML112, ML122 SERIES**

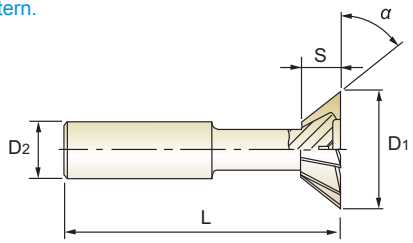
HSS-E, DOVETAIL CUTTERS TYPE “A”, “C”, “E”

HSS-E, WINKELFRÄSER FORM “A”, “C”, “E”
FRAISE HSS-E POUR QUEUE D'ARONDE TYPE "A", "C", "E"
FRESE AD ANGOLO DIVERGENTE TIPO “A”, “C”, “E”

▶ Recommanded for use in place of arbor and threaded hole type cutters to reduce set time and facilitate handling.

▶ Empfohlen zur Nutzung anstelle von Arbor und threaded hole type Cutters um Montierzeit zu verkürzen und Handhabung zu erleichtern.





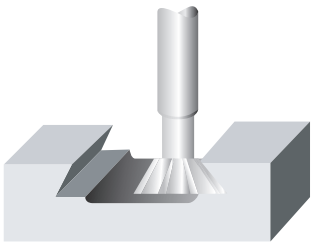
HSS-E | DIN 1833 | N | 0° | DIN 1835A | DIN 1835B | UNCOATED p.C768

Unit : mm

EDP No.		Cutter Diameter	Width of Face	Divergent Taper Angle	Shank Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	D_1(js16)	S(js14)	α(±15′)	D_2(h6)	L(js18)	Z
ML01201601	ML11201601	16.0	4	45°	12	60	6
ML01202001	ML11202001	20.0	5	45°	12	63	6
ML01202201	ML11202201	22.0	6	45°	12	67	6
ML01202501	ML11202501	25.0	6.3	45°	16	67	8
ML01202801	ML11202801	28.0	7.5	45°	16	67	8
ML01203201	ML11203201	32.0	8	45°	16	71	10
ML01203801	ML11203801	38.0	10	45°	16	80	12
ML02201601	ML12201601	16.0	6.3	60°	12	60	6
ML02202001	ML12202001	20.0	8	60°	12	63	6
ML02202201	ML12202201	22.0	9	60°	12	67	6
ML02202501	ML12202501	25.0	10	60°	16	67	8
ML02202801	ML12202801	28.0	11	60°	16	67	8
ML02203201	ML12203201	32.0	12.5	60°	16	71	10
ML02203801	ML12203801	38.0	16	60°	16	80	12
ML02204001	ML12204001	40.0	13	60°	25	85	12
ML02205001	ML12205001	50.0	16	60°	25	100	16

Tolerances according to DIN 7160 & 7161

	Nominal-Diameter in mm						
	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50	over 50 to 80	over 80 to 120
	Tolerance range in mm						
js16	±0.375	±0.45	±0.55	±0.65	±0.80	±0.95	±1.10
js14	±0.15	±0.18	±0.215	±0.26	±0.31	±0.37	±0.435
js18	±0.90	±1.10	±1.35	±1.65	±1.95	±2.30	±2.70
	Tolerance range in μm						
h6	0 / −8	0 / −9	0 / −11	0 / −13	0 / −16	0 / −19	0 / −22



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

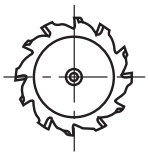
ISO	N										S					H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

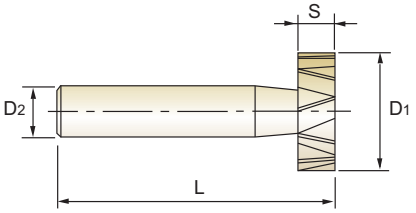
MILLING CUTTERS

PLAIN SHANK **ML062** SERIES
FLAT SHANK **ML162** SERIES

HSS-E, WOODRUFF KEYSEAT CUTTERS TYPE “B”, “D”, “F”

- HSS-E, SCHLITZFRÄSER FORM “B”, “D”, “F”
- FRAISE HSS-E WOODRUFF TYPE "B", "D", "F"
- FRESE PER CHIAVETTE WOODRUFF TIPO “B”, “D”, “F”





HSS-E | DIN 850 | N | 10°~12° | DIN 1835A | DIN 1835B | UNCOATED p.C770

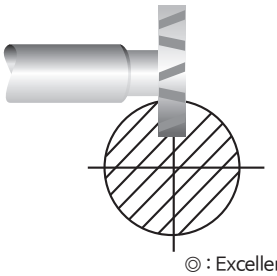
Unit : mm

EDP No.		Cutter Diameter	Width of Face	Shank Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	D_1(h11)	S(e8)	D_2(h6)	L(js18)	Z
ML06210E01	ML16210E01	10.5	2	6	50	8
ML06210E02	ML16210E02	10.5	2.5	6	50	8
ML06210E03	ML16210E03	10.5	3	6	50	8
ML06213E01	ML16213E01	13.5	2	10	56	8
ML06213E02	ML16213E02	13.5	2.5	10	56	8
ML06213E03	ML16213E03	13.5	3	10	56	8
ML06213E04	ML16213E04	13.5	4	10	56	8
ML06216E01	ML16216E01	16.5	2.5	10	56	8
ML06216E02	ML16216E02	16.5	3	10	56	8
ML06216E03	ML16216E03	16.5	4	10	56	8
ML06216E04	ML16216E04	16.5	5	10	56	8
ML06219E01	ML16219E01	19.5	3	10	56	8
ML06219E02	ML16219E02	19.5	4	10	63	8
ML06219E03	ML16219E03	19.5	5	10	63	8
ML06219E04	ML16219E04	19.5	6	10	63	8
ML06222E01	ML16222E01	22.5	4	10	63	10
-	ML16222E02	22.5	5	10	63	10
ML06222E03	ML16222E03	22.5	6	10	63	10
ML06222E04	ML16222E04	22.5	8	10	63	10
ML06225E01	ML16225E01	25.5	5	10	63	10

Tolerances according to DIN 7160 & 7161

▶ NEXT PAGE

Nominal-Diameter in ㎜	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50	over 50 to 80
Tolerance range in ㎜							
js18	± 0.90	± 1.10	± 1.35	± 1.65	± 1.95	± 2.30	± 2.70
Tolerance range in ㎛							
h11	0 - 60	0 - 75	0 - 90	0 - 110	0 - 130	0 - 160	0 - 190
e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73	- 50 - 89	- 60 - 106
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16	0 - 19



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

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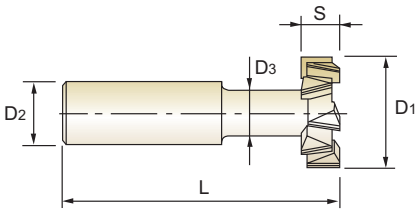
MILLING CUTTERS

PLAIN SHANK **ML072** SERIES
FLAT SHANK **ML172** SERIES

HSS-E, T-SLOT CUTTERS TYPE “AA”, “AB”, “AD”

- HSS-E, SCHAFTERFRÄSER FÜR T-NUTEN FORM “AA”, “AB”, “AD”
- FRAISE HSS-E POUR RAINURE EN "T" TYPE "AA", "AB", "AD"
- FRESE PER SCANALATURE A T - DENTI ALTERNATI



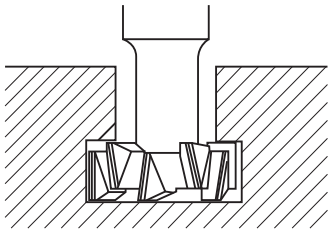
HSS-E | DIN 851 | N | 10°~20° | DIN 1835A | DIN 1835B | UNCOATED p.C771

Unit : mm

EDP No.		Cutter Diameter	Width of Face	Shank Diameter	Neck Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	D_1(d11)	S(d11)	D_2(h6)	D_3(h12)	L(js18)	Z
ML07212E01	ML17212E01	12.5	6	10	5	57	6
ML07201601	ML17201601	16.0	8	10	6.5	62	6
ML07201801	ML17201801	18.0	8	12	8	70	6
ML07201901	ML17201901	19.0	9	12	8	71	6
ML07202101	ML17202101	21.0	9	12	10	74	6
ML07202201	ML17202201	22.0	10	12	10	75	6
ML07202501	ML17202501	25.0	11	16	12	82	6
ML07202801	ML17202801	28.0	12	16	13	83	6
ML07203201	ML17203201	32.0	14	16	15	90	8
ML07203601	ML17203601	36.0	16	25	17	103	8
ML07204001	ML17204001	40.0	18	25	19	108	8

Tolerances according to DIN 7160 & 7161

Nominal-Diameter in mm	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50	over 50 to 80	over 80 to 120
Tolerance range in mm							
h12	0 - 0.12	0 - 0.15	0 - 0.18	0 - 0.21	0 - 0.25	0 - 0.30	0 - 0.35
js18	± 0.90	± 1.10	± 1.35	± 1.65	± 1.95	± 2.30	± 2.70
Tolerance range in μm							
d11	- 30 - 105	- 40 - 130	- 50 - 160	- 65 - 195	- 80 - 240	- 100 - 290	- 120 - 340
h6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16	0 - 19	0 - 22



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎		◎										

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

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MILLING CUTTERS

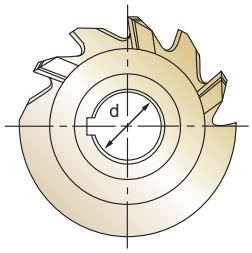
STAGGERED TEETH **ML102** SERIES

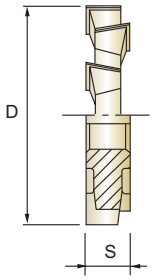
HSS-E, SIDE AND FACE MILLING CUTTERS with STAGGERED TEETH

HSS-E, SCHEIBENFRÄSER MIT KREUZVERZAHNT
FRAISE HSS-E 3 TAILLES, DENTURE ALTERNÉE
FRESE A DISCO A TRE TAGLI - DENTI ALTERNATI

▶ The type of cutter is recommended for slotting operations.
The alternate spiral effectively counteracts all tendency to chatter.

▶ Dieser Typ ist zum Schlitzfräsen geeignet. Das alternierende Spiral wirkt allen Schnatterbewegungen entgegen.





HSS-E | DIN 885-A | H | UNCOATED

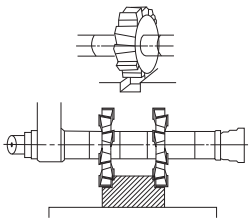
p.C773

Unit : mm

EDP No.	Cutter Diameter	Width of Face	Internal Diameter	No. of Teeth
	D(js14)	S(k11)	d(H7)	Z
ML10205001	50.0	3	16	14
ML10205002	50.0	4	16	14
ML10205003	50.0	5	16	14
ML10205004	50.0	6	16	14
ML10205005	50.0	7	16	14
ML10205006	50.0	8	16	14
ML10205008	50.0	10	16	14
ML10206301	63.0	3	22	16
ML10206302	63.0	4	22	16
ML10206303	63.0	5	22	16
ML10206304	63.0	6	22	16
ML10206306	63.0	8	22	16
ML10206307	63.0	9	22	16
ML10206308	63.0	10	22	16
ML10206310	63.0	14	22	16
ML10206311	63.0	16	22	16
ML10208001	80.0	3	22	18
ML10208002	80.0	4	22	18
ML10208003	80.0	5	22	18
ML10208004	80.0	6	22	18
ML10208005	80.0	7	22	18
ML10208006	80.0	8	22	18

Tolerances according to DIN 7160 & 7161

	Nominal-Diameter in mm								
	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50	over 50 to 80	over 80 to 120	over 120 to 180	over 180 to 250
	Tolerance range in mm								
js14	± 0.15	± 0.18	± 0.215	± 0.26	± 0.31	± 0.37	± 0.435	± 0.50	± 0.575
	Tolerance range in μm								
k11	+ 75 0	+ 90 0	+ 110 0	+ 130 0	+ 160 0	+ 190 0	+ 220 0	+ 250 0	+ 290 0
H7	+ 12 0	+ 15 0	+ 18 0	+ 21 0	+ 25 0	+ 30 0	+ 35 0	+ 40 0	+ 46 0



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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

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MILLING CUTTERS

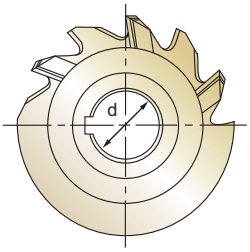
STAGGERED TEETH **ML102** SERIES

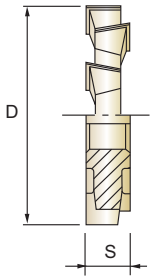
HSS-E, SIDE AND FACE MILLING CUTTERS with STAGGERED TEETH

HSS-E, SCHEIBENFRÄSER MIT KREUZVERZAHNT
FRAISE HSS-E 3 TAILLES, DENTURE ALTERNÉE
FRESE A DISCO A TRE TAGLI - DENTI ALTERNATI

▶ The type of cutter is recommended for slotting operations.
The alternate spiral effectively counteracts all tendency to chatter.

▶ Dieser Typ ist zum Schlitzfräsen geeignet. Das alternierende Spiral wirkt allen Schnatterbewegungen entgegen.





HSS-E | DIN 885-A | H | UNCOATED

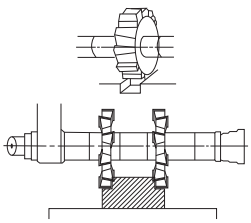
p.C773

Unit : mm

EDP No.	Cutter Diameter D(js14)	Width of Face S(k11)	Internal Diameter d(H7)	No. of Teeth Z
ML10210017	100.0	6	32	20
ML10210020	100.0	9	32	20
ML10210021	100.0	10	32	20
ML10210022	100.0	12	32	20
ML10210025	100.0	16	32	20
ML10210027	100.0	20	32	20
ML10212501	125.0	5	32	22
ML10212502	125.0	6	32	22
ML10212503	125.0	8	32	22
ML10212504	125.0	10	32	22
ML10212505	125.0	12	32	22
ML10212508	125.0	18	32	22
ML10216001	160.0	6	32	26
ML10216003	160.0	10	32	26
ML10216004	160.0	12	32	26
ML10216008	160.0	20	32	26
ML10216009	160.0	6	40	26
ML10216010	160.0	8	40	26
ML10216012	160.0	12	40	26
ML10220001	200.0	10	40	30

Tolerances according to DIN 7160 & 7161

	Nominal-Diameter in mm								
	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50	over 50 to 80	over 80 to 120	over 120 to 180	over 180 to 250
	Tolerance range in mm								
js14	± 0.15	± 0.18	± 0.215	± 0.26	± 0.31	± 0.37	± 0.435	± 0.50	± 0.575
	Tolerance range in μm								
k11	+ 75 0	+ 90 0	+ 110 0	+ 130 0	+ 160 0	+ 190 0	+ 220 0	+ 250 0	+ 290 0
H7	+ 12 0	+ 15 0	+ 18 0	+ 21 0	+ 25 0	+ 30 0	+ 35 0	+ 40 0	+ 46 0



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

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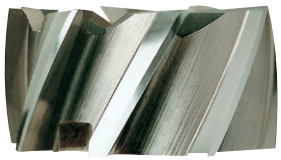
YG-1 CO., LTD.

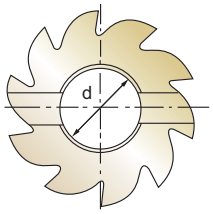
MILLING CUTTERS

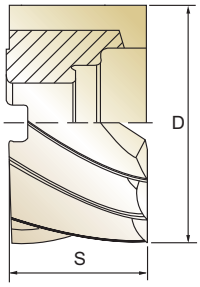
E2676 SERIES

HSS Co8, MULTI FLUTE SHELL END MILL for ALUMINUM

- HSS Co8, MULTI SCHNEIDEN WALZENSTIRNFRÄSER FÜR ALUMINIUM
- FRAISE HSS Co8, MULTI-DENTS TROU LISSE POUR ALUMINIUM
- FRESA CILINDRICA FRONTALE MULTI TAGLIENTE, PER ALLUMINIO







HSS Co8 | DIN 841 | W | 4&6 | 42° | UNCOATED p.C774

Unit : mm

EDP No.	Mill Diameter	Width of Face	Internal Diameter	No. of Teeth
	D	S	d	Z
E2676400	40.0	20	● 16	4
E2676402	40.0	40	● 16	4
E2676500	50.0	25	22	6
E2676502	50.0	50	22	6
E2676600	60.0	30	27	6
E2676601	60.0	60	27	6
E2676750	75.0	75	27	6

● Tolerance of Internal Diameter = +0.018 ~ 0
▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

HSS Co8 | DIN 1880 | W | 4&6 | 42° | UNCOATED p.C774

Unit : mm

EDP No.	Mill Diameter	Width of Face	Internal Diameter	No. of Teeth
	D	S	d	Z
E2676401	40.0	32	● 16	4
E2676501	50.0	36	22	6
E2676630	63.0	40	27	6
E2676800	80.0	45	27	6
E2676901	100.0	50	32	6

● Tolerance of Internal Diameter = +0.018 ~ 0
▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

Mill Dia. Tolerance(mm)	Width of Face Tolerance(mm)	Internal Dia. Tolerance(mm)
+ 0.25 - 0.15	+ 0.5 - 0	+ 0.02 - 0

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○		○	○			○										

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

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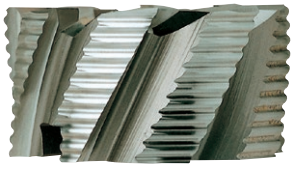
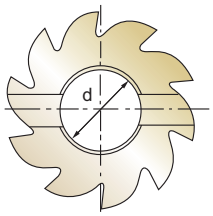
MILLING CUTTERS

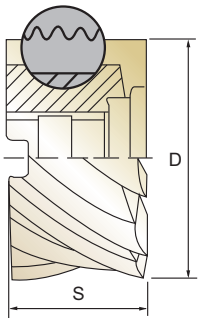
E2678 SERIES

HSS Co8, MULTI FLUTE ROUGHING SHELL END MILL - FINE

HSS Co8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPFRÄSER - FEINES
FRAISE HSS Co8, MULTI-DENTS TROU LISSE, ÉBAUCHE, PAS FIN
FRESA CILINDRICA FRONTALE MULTI TAGLIENTE, PER SGROSSATURA







HSS Co8 | DIN 841 | HR | 6-12 | 30° | UNCOATED p.C775

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth Z
E2678401	40.0	40	● 16	6
E2678501	50.0	50	22	8
E2678600	60.0	30	27	8
E2678750	75.0	35	27	10

● Tolerance of Internal Diameter = +0.018 ~ 0
▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

HSS Co8 | DIN 1880 | HR | 6-12 | 30° | UNCOATED p.C775

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth Z
E2678500	50.0	36	22	8
E2678630	63.0	40	27	8
E2678800	80.0	45	27	10
E2678901	100.0	50	32	10

▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

Mill Dia. Tolerance(mm)	Width of Face Tolerance(mm)	Internal Dia. Tolerance(mm)
+ 0.25 - 0.15	+ 0.5 - 0	+ 0.02 - 0

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

MILLING CUTTERS

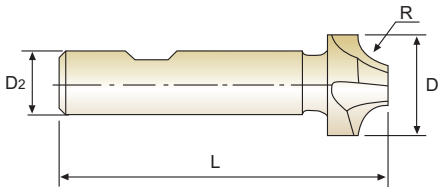
FLAT SHANK **E2498** SERIES

HSS Co8, 4 FLUTE CORNER ROUNDING CUTTERS

HSS Co8, 4 SCHNEIDEN VIERTELKREISFRÄSER
FRAISE HSS Co8, 1/4 DE CERCLE, 4 DENTS
4 TAGLIENTI PER RAGGIATURA DI SPIGOLI

▶ These tools can be adapted for many screw machine applications as end formming tools to form a specific radius.

▶ Dieses Werkzeug kann an vielen Scrow maschine als Finishingtool für spezielle Radien montiert werden.



HSS Co8 | DIN 6518 | N | 4 | 0° | DIN 1835B | UNCOATED p.C776

Unit : mm

EDP No.	Radius	Outside Diameter	Shank Diameter	Overall Length
	R(H11)	D	D2(h6)	L
E2498010	R1.0	8.0	10	60
E2498015	R1.5	9.0	10	60
E2498020	R2.0	10.0	10	60
E2498025	R2.5	11.0	10	60
E2498030	R3.0	12.0	12	60
E2498035	R3.5	13.0	12	60
E2498040	R4.0	14.0	12	60
E2498045	R4.5	15.0	12	60
E2498050	R5.0	16.0	12	60
E2498055	R5.5	19.0	16	67
E2498060	R6.0	20.0	16	67
E2498065	R6.5	21.0	16	71
E2498070	R7.0	22.0	16	71
E2498075	R7.5	23.0	16	71
E2498080	R8.0	24.0	16	71
E2498085	R8.5	25.0	25	85
E2498090	R9.0	26.0	25	85
E2498100	R10.0	28.0	25	85

▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

▶ NEXT PAGE

Tolerances according to DIN 7160 & 7161

	Nominal-Diameter in ㎜					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
	Tolerance range in ㎛					
H11	+ 60 0	+ 75 0	+ 90 0	+ 110 0	+ 130 0	+ 160 0
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13	0 - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

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MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

ML012, ML112, ML022, ML122 SERIES

MULTI FLUTE DOVETAIL CUTTERS TYPE 'A', 'C', 'E'

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)						
				16.0	20.0	25.0	32.0	40.0	50.0	63.0
P	1	Non-alloy steel	Vc	30	30	30	30	30	30	30
			fz	0.03	0.037	0.026	0.042	0.043	0.03	0.031
			RPM	597	477	382	298	239	191	152
			FEED	107	106	79	125	123	92	75
	2		Vc	15	15	15	15	15	15	15
			fz	0.031	0.036	0.031	0.041	0.043	0.026	0.031
			RPM	298	239	191	149	119	95	76
			FEED	56	52	47	61	62	40	38
	3-4		Vc	10	10	10	10	10	10	10
			fz	0.031	0.035	0.028	0.04	0.042	0.03	0.033
			RPM	199	159	127	99	80	64	51
			FEED	37	33	29	40	40	31	27
	5		Vc	10	10	10	10	10	10	10
			fz	0.021	0.02	0.02	0.02	0.022	0.02	0.023
			RPM	199	159	127	99	80	64	51
			FEED	25	19	20	20	21	20	19
	6	Low alloy steel	Vc	15	15	15	15	15	15	15
			fz	0.031	0.036	0.031	0.041	0.043	0.026	0.031
			RPM	298	239	191	149	119	95	76
			FEED	56	52	47	61	62	40	38
	7		Vc	10	10	10	10	10	10	10
			fz	0.031	0.035	0.028	0.04	0.042	0.03	0.033
			RPM	199	159	127	99	80	64	51
			FEED	37	33	29	40	40	31	27
	8-9		Vc	10	10	10	10	10	10	10
			fz	0.021	0.02	0.02	0.02	0.022	0.02	0.023
			RPM	199	159	127	99	80	64	51
			FEED	25	19	20	20	21	20	19
	10	High alloyed steel, and tool steel	Vc	15	15	15	15	15	15	15
			fz	0.031	0.036	0.031	0.041	0.043	0.026	0.031
			RPM	298	239	191	149	119	95	76
			FEED	56	52	47	61	62	40	38
	11.1		Vc	10	10	10	10	10	10	10
			fz	0.021	0.02	0.02	0.02	0.022	0.02	0.023
			RPM	199	159	127	99	80	64	51
			FEED	25	19	20	20	21	20	19
N	21~25	Aluminum-wrought alloy, Aluminum-cast, alloyed	Vc	95	85	90	90	95	85	90
			fz	0.03	0.04	0.029	0.041	0.042	0.03	0.033
			RPM	1890	1353	1146	895	756	541	455
			FEED	340	325	266	367	381	260	240

MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

ML062, ML162 SERIES

MULTI FLUTES WOODRUFF KEYSEAT CUTTERS TYPE 'B', 'D', 'F'

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)							
				10.5	13.5	16.5	19.5	22.5	28.5	32.5	45.5
P	1	Non-alloy steel	Vc	30	30	30	30	30	30	30	30
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	909	707	579	490	424	335	294	210
			FEED	73	57	116	137	170	168	212	206
	2		Vc	20	20	20	20	20	20	20	20
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	606	472	386	326	283	223	196	140
			FEED	49	38	77	91	113	112	141	137
	3-4		Vc	15	15	15	15	15	15	15	15
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	455	354	289	245	212	168	147	105
			FEED	36	28	58	69	85	84	106	103
	5		Vc	10	10	10	10	10	10	10	10
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	303	236	193	163	141	112	98	70
			FEED	24	19	39	46	57	56	71	69
	6	Low alloy steel	Vc	20	20	20	20	20	20	20	20
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	606	472	386	326	283	223	196	140
			FEED	49	38	77	91	113	112	141	137
	7		Vc	15	15	15	15	15	15	15	15
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	455	354	289	245	212	168	147	105
			FEED	36	28	58	69	85	84	106	103
	8-9		Vc	10	10	10	10	10	10	10	10
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	303	236	193	163	141	112	98	70
			FEED	24	19	39	46	57	56	71	69
	10	High alloyed steel, and tool steel	Vc	20	20	20	20	20	20	20	20
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	606	472	386	326	283	223	196	140
			FEED	49	38	77	91	113	112	141	137
	11.1		Vc	10	10	10	10	10	10	10	10
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	303	236	193	163	141	112	98	70
			FEED	24	19	39	46	57	56	71	69
N	21~25	Aluminum-wrought alloy, Aluminum-cast, alloyed	Vc	100	100	100	100	100	100	90	100
			fz	0.01	0.01	0.025	0.035	0.04	0.05	0.06	0.07
			RPM	3032	2358	1929	1632	1415	1117	881	700
			FEED	243	189	386	457	566	558	635	686

MILLING CUTTERS

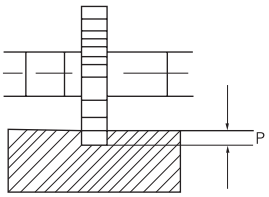
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

ML092 SERIES

MULTI FLUTES SIDE AND FACE MILLING CUTTERS WITH STRAIGHT TEETH

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)				
				50.0	63.0	80.0	100.0	125.0
P	1	Non-alloy steel	Vc	25	25	25	25	25
			fz	0.045	0.058	0.06	0.063	0.066
			RPM	159	126	99	80	64
			FEED	129	161	143	130	126
	2		Vc	20	20	20	20	20
			fz	0.04	0.036	0.041	0.038	0.05
			RPM	127	101	80	64	51
			FEED	92	80	78	63	76
	3-4		Vc	15	15	15	15	15
			fz	0.034	0.031	0.033	0.034	0.042
			RPM	95	76	60	48	38
			FEED	58	52	47	42	48
	5		Vc	10	10	10	10	10
			fz	0.031	0.029	0.03	0.03	0.036
			RPM	64	51	40	32	25
			FEED	36	32	29	25	28
	6	Low alloy steel	Vc	20	20	20	20	20
			fz	0.04	0.036	0.041	0.038	0.05
			RPM	127	101	80	64	51
			FEED	92	80	78	63	76
	7		Vc	15	15	15	15	15
			fz	0.034	0.031	0.033	0.034	0.042
			RPM	95	76	60	48	38
			FEED	58	52	47	42	48
	8-9		Vc	10	10	10	10	10
			fz	0.031	0.029	0.03	0.03	0.036
			RPM	64	51	40	32	25
			FEED	36	32	29	25	28
	10	High alloyed steel, and tool steel	Vc	20	20	20	20	20
			fz	0.04	0.036	0.041	0.038	0.05
			RPM	127	101	80	64	51
			FEED	92	80	78	63	76
	11.1		Vc	10	10	10	10	10
			fz	0.031	0.029	0.03	0.03	0.036
			RPM	64	51	40	32	25
			FEED	36	32	29	25	28
N	21~25	Aluminum-wrought alloy, Aluminum-cast, alloyed	Vc	100	100	100	100	100
			fz	0.018	0.023	0.026	0.024	0.033
			RPM	637	505	398	318	255
			FEED	206	256	248	199	252



MILLING DEPTH P = WIDTH OF FACES

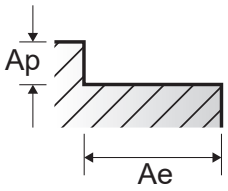
MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2675 SERIES — MULTI FLUTE SHELL END MILL

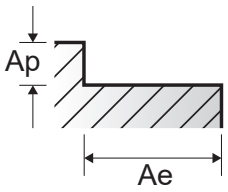
Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 40.0	50.0	63.0	80.0	100.0	125.0	160.0
P	1-2	Non-alloy steel	0.75D	0.25D	Vc	30	30	30	30	30	30	30
					fz	0.07	0.078	0.092	0.1	0.115	0.12	0.131
					RPM	239	191	152	119	95	76	60
					FEED	134	119	112	119	110	110	109
	3-4		0.75D	0.25D	Vc	25	25	25	25	25	25	30
					fz	0.075	0.077	0.091	0.1	0.119	0.113	0.119
					RPM	199	159	126	99	80	64	60
					FEED	119	98	92	99	95	86	99
	5		0.75D	0.25D	Vc	20	20	20	20	20	20	20
					fz	0.071	0.078	0.09	0.094	0.117	0.108	0.116
					RPM	159	127	101	80	64	51	40
					FEED	90	79	73	75	74	66	65
	6	Low alloy steel	0.75D	0.25D	Vc	30	30	30	30	30	30	30
					fz	0.07	0.078	0.092	0.1	0.115	0.12	0.131
					RPM	239	191	152	119	95	76	60
					FEED	134	119	112	119	110	110	109
	7		0.75D	0.25D	Vc	25	25	25	25	25	25	30
					fz	0.075	0.077	0.091	0.1	0.119	0.113	0.119
					RPM	199	159	126	99	80	64	60
					FEED	119	98	92	99	95	86	99
	8		0.75D	0.25D	Vc	20	20	20	20	20	20	20
					fz	0.071	0.078	0.09	0.094	0.117	0.108	0.116
					RPM	159	127	101	80	64	51	40
					FEED	90	79	73	75	74	66	65
	9		0.75D	0.25D	Vc	10	10	10	10	10	10	10
					fz	0.078	0.08	0.1	0.1	0.117	0.146	0.125
					RPM	80	64	51	40	32	25	20
					FEED	50	41	40	40	37	45	35
	10	High alloyed steel, and tool steel	0.75D	0.25D	Vc	30	30	30	30	30	30	30
					fz	0.07	0.078	0.092	0.1	0.115	0.12	0.131
					RPM	239	191	152	119	95	76	60
					FEED	134	119	112	119	110	110	109
	11.1		0.75D	0.25D	Vc	20	20	20	20	20	20	20
					fz	0.071	0.078	0.09	0.094	0.117	0.108	0.116
					RPM	159	127	101	80	64	51	40
					FEED	90	79	73	75	74	66	65



E2676 SERIES — MULTI FLUTE SHELL END MILL for ALUMINUM

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 30.0	40.0	50.0	60.0	63.0	75.0	80.0	100.0
N	21~25	Aluminum-wrought alloy, Aluminum-cast, alloyed	0.75D	0.25D	Vc	100	105	95	95	95	105	100	100
					fz	0.05	0.06	0.069	0.1	0.115	0.13	0.128	0.151
					RPM	1061	836	605	504	480	446	398	318
					FEED	212	201	250	302	331	348	306	288



MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2498 SERIES

4 FLUTE CORNER ROUNDING CUTTERS

Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)											
				8.0	9.0	10.0	11.0	12.0	14.0	16.0	20.0	24.0	28.0	34.0	48.0
P	1	Non-alloy steel	Vc	20	20	20	20	20	20	20	20	20	20	20	20
			fz	0.017	0.022	0.02	0.021	0.021	0.025	0.029	0.032	0.038	0.042	0.049	0.058
			RPM	796	707	637	579	531	455	398	318	265	227	187	133
			FEED	54	62	51	49	45	45	46	41	40	38	37	31
	2		Vc	15	15	15	15	15	15	15	15	15	15	15	15
			fz	0.015	0.016	0.016	0.019	0.019	0.023	0.029	0.033	0.039	0.04	0.048	0.053
			RPM	597	531	477	434	398	341	298	239	199	171	140	99
			FEED	36	34	31	33	30	31	35	32	31	27	27	21
	3-4		Vc	10	10	10	10	10	10	10	10	10	10	10	10
			fz	0.018	0.023	0.02	0.024	0.024	0.023	0.03	0.034	0.04	0.05	0.048	0.05
			RPM	398	354	318	289	265	227	199	159	133	114	94	66
			FEED	29	33	25	28	25	21	24	22	21	23	18	13
	6	Low alloy steel	Vc	15	15	15	15	15	15	15	15	15	15	15	15
			fz	0.015	0.016	0.016	0.019	0.019	0.023	0.029	0.033	0.039	0.04	0.048	0.053
			RPM	597	531	477	434	398	341	298	239	199	171	140	99
			FEED	36	34	31	33	30	31	35	32	31	27	27	21
	7-8		Vc	10	10	10	10	10	10	10	10	10	10	10	10
			fz	0.018	0.023	0.02	0.024	0.024	0.023	0.03	0.034	0.04	0.05	0.048	0.05
			RPM	398	354	318	289	265	227	199	159	133	114	94	66
			FEED	29	33	25	28	25	21	24	22	21	23	18	13
	10	High alloyed steel, and tool steel	Vc	15	15	15	15	15	15	15	15	15	15	15	15
			fz	0.015	0.016	0.016	0.019	0.019	0.023	0.029	0.033	0.039	0.04	0.048	0.053
			RPM	597	531	477	434	398	341	298	239	199	171	140	99
			FEED	36	34	31	33	30	31	35	32	31	27	27	21
	11.1		Vc	10	10	10	10	10	10	10	10	10	10	10	10
			fz	0.018	0.023	0.02	0.024	0.024	0.023	0.03	0.034	0.04	0.05	0.048	0.05
			RPM	398	354	318	289	265	227	199	159	133	114	94	66
			FEED	29	33	25	28	25	21	24	22	21	23	18	13
N	21~25	Aluminum-wrought alloy, Aluminum-cast, alloyed	Vc	90	80	90	85	90	90	80	90	90	85	85	90
			fz	0.018	0.021	0.02	0.023	0.022	0.025	0.031	0.034	0.038	0.045	0.05	0.058
			RPM	3581	2829	2865	2460	2387	2046	1592	1432	1194	966	796	597
			FEED	258	238	229	226	210	205	197	195	181	174	159	138

YG CUTTING TOOLS

TOOLING SYSTEM

HYDRAULIC CHUCK

SHRINK FIT HOLDER

ER COLLET CHUCK

END MILL HOLDER & SIDE LOCK ARBOR

SHELL MILL ARBOR

POWER MILLING CHUCK

COPY MILL ARBOR

MORSE TAPER ARBOR

TAPPING ER CHUCK

TAPPING CHUCK

SYNCHRO TAPPING CHUCK

NC DRILL CHUCK

INDEXABLE DRILL HOLDER

ACCESSORY & OTHERS

YG-1 CO., LTD.

MODEL NUMBERING SYSTEM & SURFACE FINISH

Model Numbering System

SK	40	AD/B	ER	16	70
Shank type	Shank size	Coolant Supplying System	Product name	Tool Holder I.D = Tool Shank O.D	"Gauge Line" Length and Other Spec.

Surface Finish

Guide Line to Icons

Standard of Tools	Taper Accuracy	G Value	RPM	Run-Out	Coolant System
DIN 69871-SK, DIN 69893-HSK, JIS B6339-BT, CBT	AT3	2.5G, 6.3G	25,000 RPM, 15,000 RPM	(at 3D) ≤3㎛, (I.D) ≤3㎛	AD or AD/B, AD/B, AD/B+C, AD, AD+C

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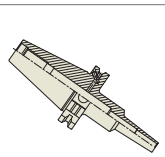
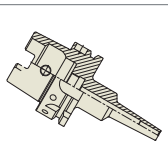
SHRINK FIT HOLDER

Series	SFHS			SFH			
Type	EXTRA SLIM			STANDARD			
Shank	SK (DIN 69871)	BT (JIS B6339/ MAS 403)	HSK (DIN 69893/ ISO 12164)	SK (DIN 69871)	CBT (BT DUAL CONTACT)	BT (JIS B6339/ MAS 403)	HSK (DIN 69893/ ISO 12164)
Page	D11	D40	D60	D12	D34	D41	D61
Tool Holder							

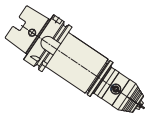
Series	SFHC			SFH
Type	COOLANT CHANNEL			EXTENSION
Shank	SK (DIN 69871)	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)	STRAIGHT TYPE
Page	D14	D42	D64	D76
Tool Holder				

END MILL HOLDER & SIDE LOCK ARBOR

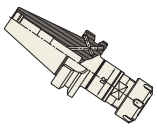
Series	EMH					
Type	STANDARD					
Shank	SK (DIN 69871)	SK (DIN 69871)	BT (JIS B6339/MAS 403)	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)	HSK (DIN 69893/ISO 12164)
Page	D19	D22	D46	D47	D67	D69
Tool Holder	2.5G	6.3G	2.5G	6.3G	2.5G	6.3G

Series	EMH				SLA	
Type	COOLANT CHANNEL				SIDE LOCK ARBOR	
Shank	SK (DIN 69871)	SK (DIN 69871)	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)	CBT (BT DUAL CONTACT)	BT (JIS B6339/MAS 403)
Page	D21	D24	D47	D68	D35	D48
Tool Holder	2.5G	6.3G	2.5G	2.5G		

NC DRILL CHUCK

Series	HKD			NPU
Type	HEX. KEY TYPE			KEYLESS TYPE
Shank	SK (DIN 69871)	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)	STRAIGHT TYPE
Page	D33	D55	D75	D78
Tool Holder				

SYNCHRO TAPPING CHUCK

Series	SYTER				SYTC
Type	ER COLLET				QUICK CHANGE TYPE
Shank	SK (DIN 69871)	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)	STRAIGHT TYPE	SK (DIN 69871)
Page	D30	D52	D73	D77	D30
Tool Holder					

TAPPING ER CHUCK

Series	TER	
Type	ER COLLET	
Shank	SK (DIN 69871)	BT (JIS B6339/MAS 403)
Page	D31	D52
Tool Holder		

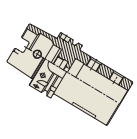
TAPPING CHUCK

Series	TC		
Type	QUICK CHANGE TYPE		
Standard	SK (DIN 69871)	BT (JIS B6339/MAS 403)	HSK (DIN 69893/ISO 12164)
Page	D31	D53	D74
Tool Holder			

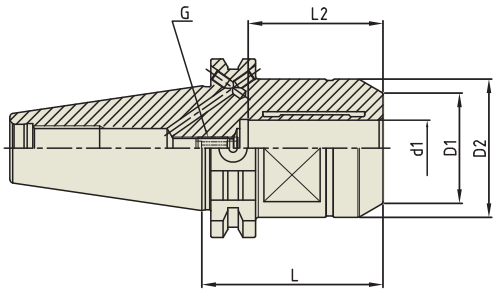
MORSE TAPER ARBOR

Series	MTA		
Shank	SK (DIN 69871)	BT (JIS B6339/ MAS 403)	HSK (DIN 69893/ ISO 12164)
Page	D29	D51	D72
Tool Holder			

INDEXABLE DRILL HOLDER

Series	SL		
Standard	SK (DIN 69871)	BT (JIS B6339/ MAS 403)	HSK (DIN 69893/ ISO 12164)
Page	D33	D55	D75
Tool Holder			

HYDRAULIC CHUCK (Power E Hydro) — HCP



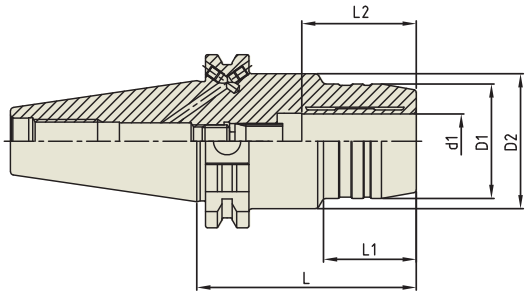
DIN 69871-SK | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD/B

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	WEIGHT (Kg)
40	SK40AD/B-HC12P-50	P2776651P	12	32	42	50	41	M8x1.0	1.00
	SK40AD/B-HC20P-64.5	P2534001P	20	39.3	49.3	64.5	48	M8x1.0	1.20
50	SK50AD/B-HC20P-64.5	P2756010P	20	39.3	49.3	64.5	48	M8x1.0	2.80
	SK50AD/B-HC32P-81	P2534002P	32	58.5	72	81	57	M8x1.0	3.90

- For applicable hydraulic chuck collet, please refer to page 80-82.
- Balancing grade G2.5 at 25,000 RPM or U max < 1 gmm.
- Supplied with clamping T-wrench.

HYDRAULIC CHUCK (Radial Tool Length Pre-setting Type) — HCR



DIN 69871-SK | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD/B

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	WEIGHT (Kg)
40	SK40AD/B-HCR12-80.5	P2554018	12	32	49.5	80.5	31.5	37	1.50
	SK40AD/B-HCR20-80.5	P2554019	20	42	49.5	80.5	34	42	1.60

- For applicable hydraulic chuck collet, please refer to page 80-82.
- Balancing grade G2.5 at 25,000 RPM or U max < 1 gmm.
- Supplied with clamping T-wrench.

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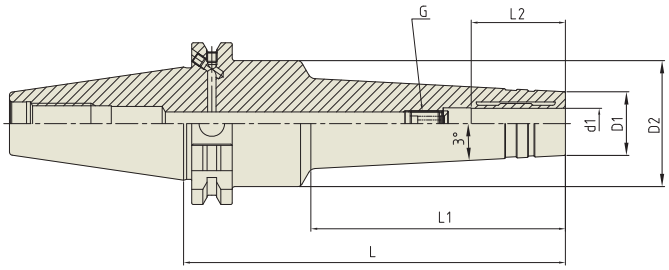
HYDRAULIC CHUCK (For Mold and Die)

HMC



DIN 69871-SK | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD/B

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	G	WEIGHT (Kg)
40	SK40AD/B-HMC6-120	P2770701	6	20	49.5	120	70	27	M5×0.8	1.40
	SK40AD/B-HMC6-150	P2770702	6	20	49.5	150	100	27	M5×0.8	1.65
	SK40AD/B-HMC8-120	P2770703	8	22	49.5	120	70	27	M6×1.0	1.40
	SK40AD/B-HMC8-150	P2770704	8	22	49.5	150	100	27	M6×1.0	1.65
	SK40AD/B-HMC10-120	P2770705	10	24	49.5	120	70	32	M8×1.0	1.40
	SK40AD/B-HMC10-150	P2770706	10	24	49.5	150	100	32	M8×1.0	1.65
	SK40AD/B-HMC12-120	P2770707	12	25	49.5	120	70	37	M10×1.0	1.40
	SK40AD/B-HMC12-150	P2770708	12	25	49.5	150	100	37	M10×1.0	1.65
	SK40AD/B-HMC20-120	P2770711	20	34	49.5	120	70	42	M16×1.0	1.50
	SK40AD/B-HMC20-150	P2770712	20	34	49.5	150	100	42	M16×1.0	1.70

- For applicable hydraulic chuck collet, please refer to page 80-82.
- Balancing grade G2.5 at 25,000 RPM or U max < 1 gmm.
- Supplied with clamping T-wrench.

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SHRINK FIT HOLDER

SFH

FIG.1

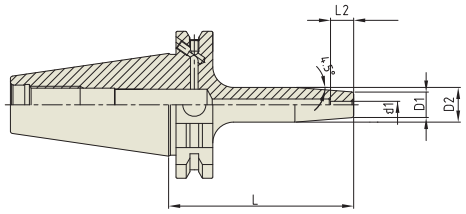
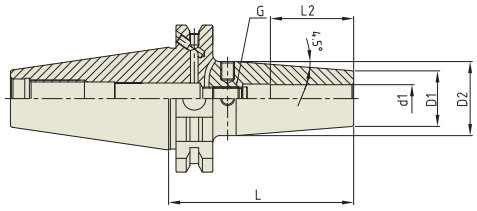


FIG.2



DIN 69871-SK | AT3 | 2.5G | 25,000 RPM | (LD) ≤3μm | AD/B

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	FIG.	WEIGHT (Kg)
	SK40AD/B-SFH3-80	P2771301	3	11	15	80	10	-	1	1.00
	SK40AD/B-SFH3-120	P2771336	3	11	15	120	10	-	1	-
	SK40AD/B-SFH3-160	P2771337	3	11	15	160	10	-	1	-
	SK40AD/B-SFH4-80	P2771302	4	11	15	80	12	-	1	1.00
	SK40AD/B-SFH4-120	P2771340	4	11	15	120	12	-	1	-
	SK40AD/B-SFH4-160	P2771341	4	11	15	160	12	-	1	-
	SK40AD/B-SFH5-80	P2771303	5	11	15	80	15	-	1	1.00
	SK40AD/B-SFH5-120	P2771342	5	11	15	120	15	-	1	-
	SK40AD/B-SFH5-160	P2771343	5	11	15	160	15	-	1	-
	SK40AD/B-SFH6-80	P2554058	6	21	27	80	36	M5×0.8	2	1.10
	SK40AD/B-SFH6-120	P2554057	6	21	27	120	36	M5×0.8	2	-
	SK40AD/B-SFH6-160	P2771304	6	21	27	160	36	M5×0.8	2	1.15
	SK40AD/B-SFH8-80	P2600009	8	21	27	80	36	M6×1.0	2	1.11
	SK40AD/B-SFH8-120	P2771344	8	21	27	120	36	M6×1.0	2	-
	SK40AD/B-SFH8-160	P2771305	8	21	27	160	36	M6×1.0	2	1.15
	SK40AD/B-SFH10-80	P2554052	10	24	32	80	42	M8×1.0	2	1.10
40	SK40AD/B-SFH10-120	P2554051	10	24	32	120	42	M8×1.0	2	-
	SK40AD/B-SFH10-160	P2771306	10	24	32	160	42	M8×1.0	2	1.15
	SK40AD/B-SFH12-80	P2600008	12	24	32	80	47	M10×1.0	2	1.10
	SK40AD/B-SFH12-120	P2771332	12	24	32	120	47	M10×1.0	2	-
	SK40AD/B-SFH12-160	P2771307	12	24	32	160	47	M10×1.0	2	1.15
	SK40AD/B-SFH16-80	P2554054	16	27	34	80	50	M12×1.0	2	1.20
	SK40AD/B-SFH16-120	P2771333	16	27	34	120	50	M12×1.0	2	-
	SK40AD/B-SFH16-160	P2554053	16	27	34	160	50	M12×1.0	2	1.50
	SK40AD/B-SFH18-80	P2771321	18	33	42	80	50	M12×1.0	2	1.30
	SK40AD/B-SFH20-80	P2554056	20	33	42	80	52	M16×1.0	2	1.60
	SK40AD/B-SFH20-120	P2771334	20	33	42	120	52	M16×1.0	2	-
	SK40AD/B-SFH20-160	P2554055	20	33	42	160	52	M16×1.0	2	1.70
	SK40AD/B-SFH25-90	P2771323	25	44	53	90	58	M16×1.0	2	1.70
	SK40AD/B-SFH25-100	P2771335	25	44	53	100	58	M16×1.0	2	-
	SK40AD/B-SFH25-160	P2771324	25	44	53	160	58	M16×1.0	2	2.00
	SK40AD/B-SFH32-100	P2771338	32	44	53	100	63	M16×1.0	2	-
	SK40AD/B-SFH32-160	P2771339	32	44	53	160	63	M16×1.0	2	-

▶ Supplied without balancing screws.
▶ Balancing grade G2.5 at 25,000 RPM or U max < 1 gmm.

▶ NEXT PAGE

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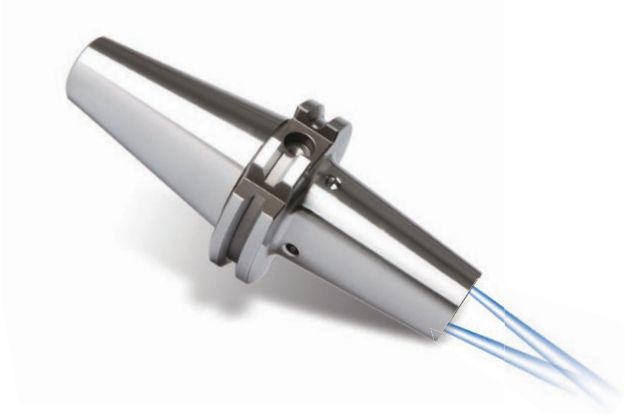
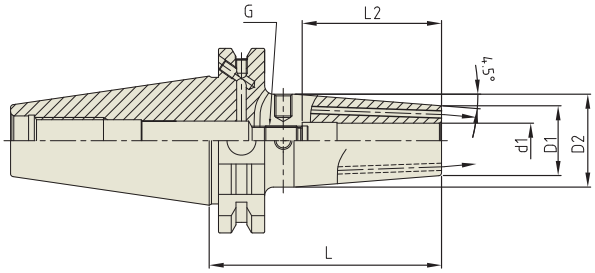
SHRINK FIT HOLDER (Coolant Channel)

SFHC





DIN 69871-SK | AT3 | 2.5G | 25,000 RPM | (LD) ≤3μm | AD/B+C

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	WEIGHT (Kg)
40	SK40AD/B-SFH6C-80	P2801301C	6	21	27	80	36	M5x0.8	1.10
	SK40AD/B-SFH6C-120	P2771368C	6	21	27	120	36	M5x0.8	1.15
	SK40AD/B-SFH6C-160	P2801302C	6	21	27	160	36	M5x0.8	1.15
	SK40AD/B-SFH8C-80	P2801303C	8	21	27	80	36	M6x1.0	1.11
	SK40AD/B-SFH8C-120	P2771369C	8	21	27	120	36	M6x1.0	-
	SK40AD/B-SFH8C-160	P2801304C	8	21	27	160	36	M6x1.0	1.15
	SK40AD/B-SFH10C-80	P2801305C	10	24	32	80	42	M8x1.0	1.10
	SK40AD/B-SFH10C-120	P2771362C	10	24	32	120	42	M8x1.0	-
	SK40AD/B-SFH10C-160	P2801306C	10	24	32	160	42	M8x1.0	1.15
	SK40AD/B-SFH12C-80	P2801307C	12	24	32	80	47	M10x1.0	1.10
	SK40AD/B-SFH12C-120	P2771363C	12	24	32	120	47	M10x1.0	-
	SK40AD/B-SFH12C-160	P2801308C	12	24	32	160	47	M10x1.0	1.15
	SK40AD/B-SFH16C-80	P2801311C	16	27	34	80	50	M12x1.0	1.20
	SK40AD/B-SFH16C-120	P2771364C	16	27	34	120	50	M12x1.0	-
	SK40AD/B-SFH16C-160	P2801312C	16	27	34	160	50	M12x1.0	1.50
	SK40AD/B-SFH20C-80	P2801315C	20	33	42	80	52	M16x1.0	1.40
	SK40AD/B-SFH20C-120	P2771365C	20	33	42	120	52	M16x1.0	1.40
	SK40AD/B-SFH20C-160	P2801316C	20	33	42	160	52	M16x1.0	1.70
	SK40AD/B-SFH25C-90	P2801317C	25	44	53	90	58	M16x1.0	1.70
	SK40AD/B-SFH25C-100	P2771366C	25	44	53	100	58	M16x1.0	-
	SK40AD/B-SFH25C-160	P2801318C	25	44	53	160	58	M16x1.0	-
	SK40AD/B-SFH32C-100	P2771367C	32	44	53	100	63	M16x1.0	-

▶ NEXT PAGE

- ▶ Supplied without balancing screw.
- ▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
- ▶ With two coolant channel bores.
- ▶ Resealable coolant channel type is available upon request.
  (Thread for plugging screws & 2 screws)

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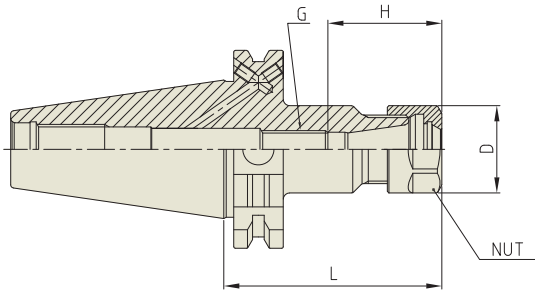
ER COLLET CHUCK

ER



DIN 69871-SK | AT3 | 2.5G | 25,000 RPM | AD/B

Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	G	H	NUT/ COLLET	WEIGHT (Kg)
40	SK40AD/B-ER11-70	P2774812	0.5 - 7.0	70	19	M6	45	ER11	0.90
	SK40AD/B-ER11-100	P2774826	0.5 - 7.0	100	19	M6	45	ER11	0.95
	SK40AD/B-ER16-70	P2774801	0.5 - 10.0	70	28	M10	45	ER16	0.44
	SK40AD/B-ER16-100	P2774804	0.5 - 10.0	100	28	M10	45	ER16	0.56
	SK40AD/B-ER16-130	P2774827	0.5 - 10.0	130	28	M10	45	ER16	0.69
	SK40AD/B-ER16-160	P2774828	0.5 - 10.0	160	28	M10	45	ER16	0.81
	SK40AD/B-ER16-200	P2774848	0.5 - 10.0	200	28	M10	45	ER16	0.95
	SK40AD/B-ER20-70	P2774813	0.5 - 13.0	70	34	M12	50	ER20	0.47
	SK40AD/B-ER20-100	P2774820	0.5 - 13.0	100	34	M12	50	ER20	0.64
	SK40AD/B-ER20-130	P2774829	0.5 - 13.0	130	34	M12	50	ER20	0.80
	SK40AD/B-ER20-160	P2774830	0.5 - 13.0	160	34	M12	50	ER20	1.00
	SK40AD/B-ER20-200	P2774849	0.5 - 13.0	200	34	M12	50	ER20	1.25
	SK40AD/B-ER25-70	P2774802	1.0 - 16.0	70	42	M12	65	ER25	0.56
	SK40AD/B-ER25-100	P2774805	1.0 - 16.0	100	42	M12	65	ER25	0.84
	SK40AD/B-ER25-130	P2774831	1.0 - 16.0	130	42	M12	65	ER25	1.14
	SK40AD/B-ER25-160	P2774832	1.0 - 16.0	160	42	M12	65	ER25	1.44
	SK40AD/B-ER25-200	P2774850	1.0 - 16.0	200	42	M12	65	ER25	1.94
	SK40AD/B-ER32-70	P2774803	1.0 - 20.0	70	50	M12	65	ER32	0.51
	SK40AD/B-ER32-100	P2774806	1.0 - 20.0	100	50	M12	65	ER32	0.88
	SK40AD/B-ER32-130	P2774833	1.0 - 20.0	130	50	M12	65	ER32	1.21
	SK40AD/B-ER32-160	P2774834	1.0 - 20.0	160	50	M12	65	ER32	1.54
	SK40AD/B-ER32-200	P2774851	1.0 - 20.0	200	50	M12	65	ER32	1.94
	SK40AD/B-ER40-80	P2774814	2.0 - 30.0	80	63	M12	75	ER40	0.65
	SK40AD/B-ER40-100	P2774835	2.0 - 30.0	100	63	M12	75	ER40	0.90
	SK40AD/B-ER40-130	P2774836	2.0 - 30.0	130	63	M12	75	ER40	1.34
	SK40AD/B-ER40-160	P2774837	2.0 - 30.0	160	63	M12	75	ER40	1.77
	SK40AD/B-ER40-200	P2774852	2.0 - 30.0	200	63	M12	75	ER40	2.27
50	SK50AD/B-ER16-70	P2774815	0.5 - 10.0	70	28	M10	45	ER16	2.71
	SK50AD/B-ER20-70	P2774816	0.5 - 13.0	70	34	M12	50	ER20	2.78
	SK50AD/B-ER20-100	P2774822	0.5 - 13.0	100	34	M12	50	ER20	2.88
	SK50AD/B-ER25-70	P2774817	1.0 - 16.0	70	42	M12	65	ER25	2.75
	SK50AD/B-ER25-100	P2774823	1.0 - 16.0	100	42	M12	65	ER25	3.06
	SK50AD/B-ER32-70	P2774818	1.0 - 20.0	70	50	M12	65	ER32	2.84
	SK50AD/B-ER32-100	P2774824	1.0 - 20.0	100	50	M12	65	ER32	3.29
	SK50AD/B-ER40-80	P2774819	2.0 - 30.0	80	63	M12	75	ER40	3.10

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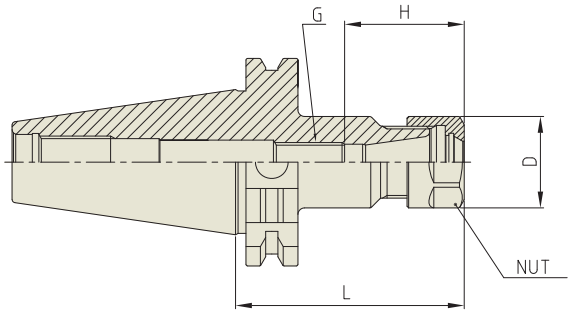
ER COLLET CHUCK

ER



DIN 69871-SK | AT3 | 6.3G | 15,000 RPM | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	G	H	NUT/ COLLET	WEIGHT (Kg)
40	SK40-ER11-70	P2527006	0.5 - 7.0	70	19	M6	45	ER11	0.90
	SK40-ER16-70	P2776417	0.5 - 10.0	70	28	M10	45	ER16	0.44
	SK40-ER16-100	P2527018	0.5 - 10.0	100	28	M10	45	ER16	0.56
	SK40-ER16-160	P2527029	0.5 - 10.0	160	28	M10	45	ER16	0.81
	SK40-ER20-70	P2776418	0.5 - 13.0	70	34	M12	50	ER20	0.47
	SK40-ER20-100	P2527019	0.5 - 13.0	100	34	M12	50	ER20	0.64
	SK40-ER25-70	P2776419	1.0 - 16.0	70	42	M12	65	ER25	0.56
	SK40-ER25-100	P2776429	1.0 - 16.0	100	42	M12	65	ER25	0.84
	SK40-ER32-70	P2776420	1.0 - 20.0	70	50	M12	65	ER32	0.51
	SK40-ER32-100	P2776430	1.0 - 20.0	100	50	M12	65	ER32	0.88
	SK40-ER40-80	P2527011	2.0 - 30.0	80	63	M12	75	ER40	0.65
	SK40-ER40-100	P2527036	2.0 - 30.0	100	63	M12	75	ER40	0.90
50	SK50-ER16-70	P2527012	0.5 - 10.0	70	28	M12	45	ER16	2.71
	SK50-ER25-70	P2776424	1.0 - 16.0	70	42	M12	65	ER25	2.75
	SK50-ER25-100	P2527024	1.0 - 16.0	100	42	M12	65	ER25	3.06
	SK50-ER25-160	P2527044	1.0 - 16.0	160	42	M12	65	ER25	3.57
	SK50-ER32-70	P2776425	1.0 - 20.0	70	50	M12	65	ER32	2.84
	SK50-ER32-100	P2527025	1.0 - 20.0	100	50	M12	65	ER32	3.29
	SK50-ER32-160	P2527046	1.0 - 20.0	160	50	M12	65	ER32	4.06

▶ For applic.able ER collet, please refer to page 83-92.
▶ For applic.able ER nut, please refer to page 93, Sealing disk & spanner page 94-95.

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END MILL HOLDER

EMH

DIN 69871-SK | AT3 | 2.5G | 25,000 RPM | AD/B

FIG.1

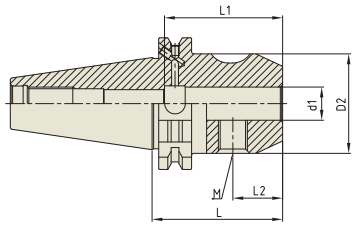
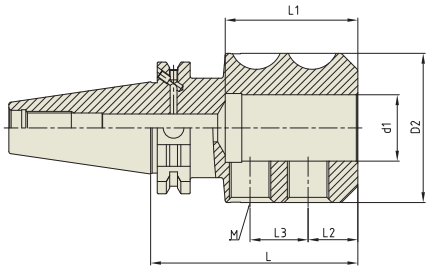


FIG.2



Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	FIG.	WEIGHT (Kg)
50	SK50AD/B-EMH6-63	P2779038	6	25	50	35	18	-	M6	1	2.70
	SK50AD/B-EMH8-63	P2779039	8	28	50	35	18	-	M8	1	2.70
	SK50AD/B-EMH10-63	P2779040	10	35	50	39	20	-	M10	1	2.90
	SK50AD/B-EMH12-63	P2779041	12	42	63	46	22.5	-	M12	1	2.90
	SK50AD/B-EMH16-63	P2779042	16	48	63	49	24	-	M14	1	3.00
	SK50AD/B-EMH20-63	P2779043	20	52	63	52	25	-	M16	1	3.05
	SK50AD/B-EMH25-80	P2779044	25	65	80	60	24	25	M18	2	3.73
	SK50AD/B-EMH32-100	P2779045	32	72	100	64	24	28	M20	2	4.53

- Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
- Standard End Mill Holder is for a cutting tool with Weldon shank and End Mill Holder for a cutting tool with Whistle notch shank is available upon request.
- Combi-style holder with ball jointed clamping screw which can be used with cutting tools with weldon and Whistle notch shank is available.

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END MILL HOLDER

EMH

DIN 69871-SK | AT3 | 6.3G | 15,000 RPM | AD

FIG.1

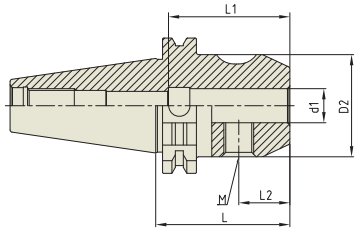
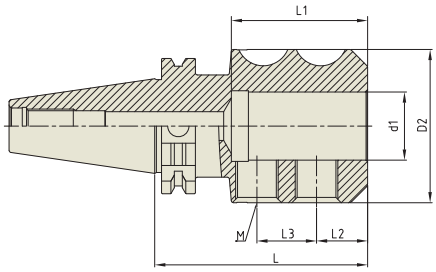


FIG.2



Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	FIG.	WEIGHT (Kg)
40	SK40-EMH6-50	P2521009	6	25	50	35	18	-	M6	1	0.86
	SK40-EMH8-50	P2521010	8	28	50	35	18	-	M8	1	0.89
	SK40-EMH10-50	P2521011	10	35	50	39	20	-	M10	1	0.95
	SK40-EMH12-50	P2521012	12	42	50	46	22.5	-	M12	1	1.03
	SK40-EMH16-63	P2521013	16	48	63	57	24	-	M14	1	1.26
	SK40-EMH20-63	P2521014	20	52	63	54	25	-	M16	1	1.28
	SK40-EMH25-100	P2521015	25	65	100	60	24	25	M18	2	2.28
	SK40-EMH32-100	P2521016	32	72	100	64	24	28	M20	2	2.50
50	SK50-EMH10-63	P2521019	10	35	50	39	20	-	M10	1	2.90
	SK50-EMH20-63	P2521022	20	52	63	52	25	-	M16	1	3.05
	SK50-EMH25-80	P2521023	25	65	80	60	24	25	M18	2	3.73
	SK50-EMH32-100	P2521024	32	72	100	64	24	28	M20	2	4.53

- Standard End Mill Holder is for a cutting tool with Weldon shank and End Mill Holder for a cutting tool with Whistle notch shank is available upon request.
- Combi-style holder with ball jointed clamping screw which can be used with cutting tools with weldon and Whistle notch shank is available.

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END MILL HOLDER (Coolant Channel)

EMH

DIN 69871-SK | AT3 | 6.3G | 15,000 RPM | AD/B+C

FIG.1

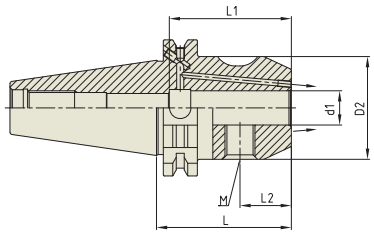
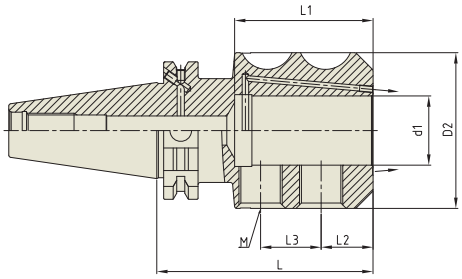


FIG.2



Unit : mm

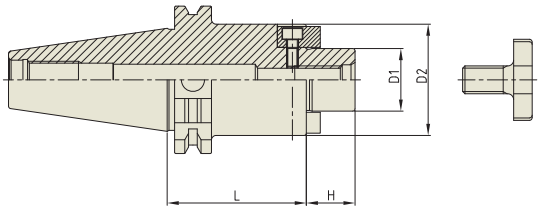
TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	FIG.	WEIGHT (Kg)
40	SK40AD/B-EMH6C-50	P2779001	6	25	50	35	18	-	M6	1	0.86
	SK40AD/B-EMH10C-50	P2779003	10	35	50	39	20	-	M10	1	0.95
	SK40AD/B-EMH16C-63	P2779006	16	48	63	54	24	-	M14	1	1.28
	SK40AD/B-EMH32C-100	P2779010	32	72	100	64	24	28	M20	2	2.50

▸ Standard End Mill Holder is for a cutting tool with Weldon shank and End Mill Holder for a cutting tool with Whistle notch shank is available upon request.
▸ Combi-style holder with ball jointed clamping screw which can be used with cutting tools with weldon and Whistle notch shank is available.

SHELL MILL ARBOR (Small Face)

SMA

DIN 69871-SK | AT3 | 6.3G | 15,000 RPM | AD



Unit : mm

TAPER No.	MODEL No.	EDP No.	D1	D2	L	H	BOLT	WEIGHT (Kg)
40	SK40-SMA16-60	P2778904	16	32	60	17	M8x16L	0.35
	SK40-SMA27-60	P2778906	27	48	60	21	M12x22L	1.70
	SK40-SMA27-120	P2778917	27	48	120	21	M12x22L	2.40
	SK40-SMA32-60	P2778907	32	58	60	24	M16x26L	1.80
	SK40-SMA32-120	P2778918	32	58	120	24	M16x26L	3.70
50	SK50-SMA16-75	P2778909	16	32	75	17	M8x16L	2.80
	SK50-SMA16-120	P2778919	16	32	120	17	M8x16L	3.90
	SK50-SMA32-75	P2778912	32	58	75	24	M16x26L	3.80
	SK50-SMA32-120	P2778922	32	58	120	24	M16x26L	5.00
	SK50-SMA40-75	P2778913	40	70	75	27	M20x30L	4.50

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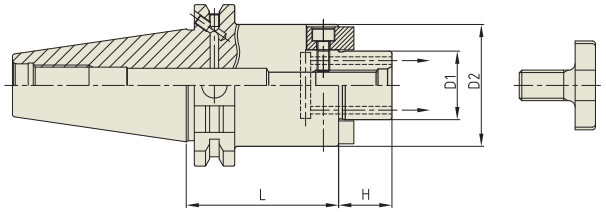
SHELL MILL ARBOR (Coolant Channel & Small Face)

SMA



DIN 69871-SK | AT3 | 6.3G | 15,000 RPM | AD/B+C

Unit : mm

TAPER No.	MODEL No.	EDP No.	D1	D2	L	H	BOLT	WEIGHT (Kg)
40	SK40AD/B-SMA16C-60	P2801004C	16	32	60	17	M8x16L	0.35
	SK40AD/B-SMA16C-120	P2801015C	16	32	120	17	M8x16L	0.70
	SK40AD/B-SMA22C-60	P2801005C	22	40	60	19	M10x18L	1.03
	SK40AD/B-SMA22C-120	P2801016C	22	40	120	19	M10x18L	1.60
	SK40AD/B-SMA27C-60	P2801006C	27	48	60	21	M12x22L	1.16
	SK40AD/B-SMA27C-120	P2801017C	27	48	120	21	M12x22L	1.97
	SK40AD/B-SMA32C-60	P2801007C	32	58	60	24	M16x26L	1.64
	SK40AD/B-SMA32C-120	P2801018C	32	58	120	24	M16x26L	2.00
	SK40AD/B-SMA40C-60	P2801008C	40	70	60	27	M20x30L	1.83
50	SK50AD/B-SMA16C-75	P2801009C	16	32	75	17	M8x16L	2.20
	SK50AD/B-SMA16C-120	P2801019C	16	32	120	17	M8x16L	2.50
	SK50AD/B-SMA22C-75	P2801010C	22	40	75	19	M10x18L	3.10
	SK50AD/B-SMA22C-120	P2801020C	22	40	120	19	M10x18L	3.60
	SK50AD/B-SMA27C-75	P2801011C	27	48	75	21	M12x22L	3.40
	SK50AD/B-SMA27C-120	P2801021C	27	48	120	21	M12x22L	4.00
	SK50AD/B-SMA32C-75	P2801012C	32	58	75	24	M16x26L	3.80
	SK50AD/B-SMA32C-120	P2801022C	32	58	120	24	M16x26L	4.40
	SK50AD/B-SMA40C-75	P2801013C	40	70	75	27	M20x30L	4.50
	SK50AD/B-SMA50C-75	P2801014C	50	90	75	30	M24x36L	5.90

▶ With "Coolant Through" by coolant channels.

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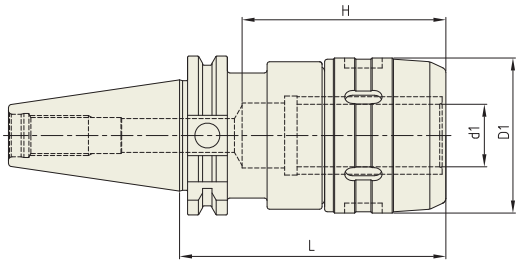
HIGH-SPEED POWER MILLING CHUCK

C



DIN 69871-SK AT3 AD

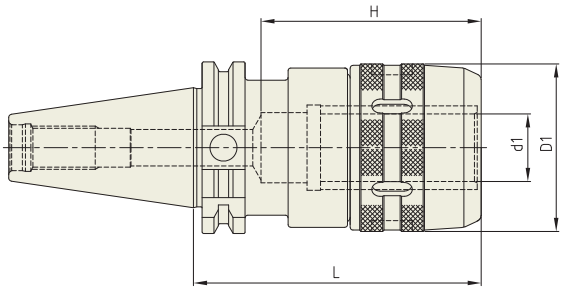
Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	L	H	WEIGHT (Kg)
40	SK40-C20-105HS	P2526022	20	54	105	70	1.77
	SK40-C25-105HS	P2773001	25	62	105	80	2.10
	SK40-C32-105HS	P2526023	32	72	105	100	2.40
50	SK50-C32-105HS	P2773004	32	72	105	100	4.30

▶ For applicable collet and spanner, please refer to the page 95.
▶ Balancing Grade is adjusted on Basic holder only without Clamping Cap.

POWER MILLING CHUCK

C



DIN 69871-SK AT3 AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	L	H	WEIGHT (Kg)
40	SK40-C20-90	P2526003	20	54	90	70	1.60
	SK40-C32-90	P2526004	32	72	90	100	2.00
	SK40-C32-105	P2526010	32	72	105	100	2.42
	SK40-C32-135	P2526015	32	72	135	100	3.11
50	SK50-C20-80	P2526005	20	54	80	70	3.22
	SK50-C25-105	P2526012	25	62	105	80	3.78
	SK50-C32-90	P2526007	32	72	90	100	3.87
	SK50-C32-105	P2526013	32	72	105	100	4.31
	SK50-C32-165	P2526020	32	72	165	100	5.59

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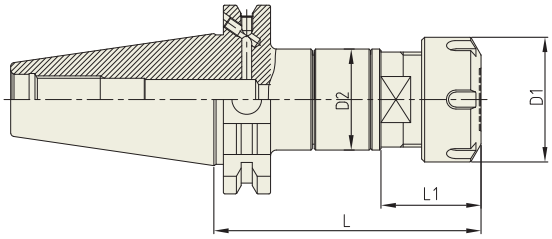
SYNCHRO TAPPING CHUCK (ER Type) — SYTER



DIN 69871-SK | AT3 | AD/B

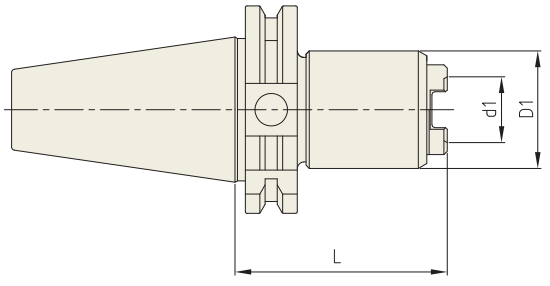
Unit : mm

TAPER No.	MODEL No.	EDP No.	d1 (TAP SIZE)	NUT/ COLLET	D1	D2	L	L1	Tension/ Compression	WEIGHT (Kg)
40	SK40AD/B-SYTER12-79	P2773701	M3-M12	ER16	28	34	79	26	±0.2	1.00
	SK40AD/B-SYTER16-85	P2773702	M3-M16	ER20	34	34	85	27	±0.2	1.08
	SK40AD/B-SYTER20-90	P2773703	M3-M20	ER25	42	34	90	34	±0.2	1.08
	SK40AD/B-SYTER27-100	P2773704	M4-M27	ER32	50	45	100	31	±0.2	1.37
	SK40AD/B-SYTER33-120	P2773705	M4-M33	ER40	63	62	120	35	±0.2	2.16
50	SK50AD/B-SYTER20-90	P2773708	M3-M20	ER25	42	34	90	34	±0.2	2.87
	SK50AD/B-SYTER33-105	P2773710	M4-M33	ER40	63	62	105	35	±0.2	3.93

▶ Feature :
- Compensation for synchronization error to extend tap life and to improve thread quality.
- To compensate for pitch tolerance of taps.
- For Machine with asynchronized spindle.

▶ ER collet of page 83-90 and Tap ER collet of page 91-92.

SYNCHRO TAPPING CHUCK (Quick Change Type) — SYTC



DIN 69871-SK | AT3

Unit : mm

TAPER No.	MODEL No.	EDP No.	TAP SIZE	TAP ADAPTOR	d1	D1	L	WEIGHT (Kg)
40	SK40-SYTC12-65	P2774201	M3-M12	TCS12	19	36	65	1.10
50	SK50-SYTC12-65	P2774204	M3-M12	TCS12	19	36	65	3.00

▶ Feature :
- Compensation for synchronization errors to extend tap life and to improve thread quality.
- To compensate for pitch tolerances of taps.
- For machine with synchronized spindle.

▶ For applicable Tap Adaptor, please refer to the page 97.

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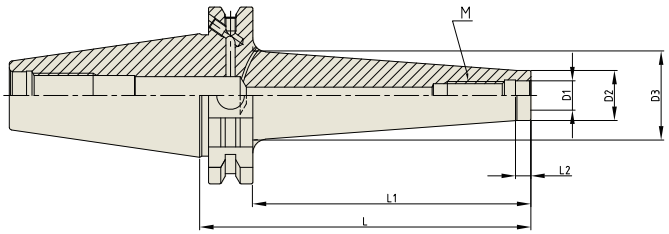
COPY MILL ARBOR

M



DIN 69871-SK | AT3 | 2.5G | 25,000 RPM | (LD) ≤3μm | AD/B

Unit : mm

TAPER No.	MODEL No. (M-L1)	EDP No.	D1	D2	D3	L	L1	L2	WEIGHT (Kg)
40	SK40AD/B-M6-25	P2801701	6.5	10	13	44	25	5	0.80
	SK40AD/B-M10-5	P2801706	10.5	18	18	24	5	5	0.77
	SK40AD/B-M10-25	P2801707	10.5	18	20	44	25	5	0.79
	SK40AD/B-M10-50	P2801708	10.5	18	23	69	50	5	0.85
	SK40AD/B-M10-75	P2801709	10.5	18	28	94	75	5	0.87
	SK40AD/B-M10-100	P2801710	10.5	18	32	119	100	5	1.12
	SK40AD/B-M10-150	P2801711	10.5	18	36.5	169	150	5	1.38
	SK40AD/B-M12-50	P2801714	12.5	21	24	69	50	5	0.85
	SK40AD/B-M12-75	P2801715	12.5	21	31	94	75	5	1.02
	SK40AD/B-M12-100	P2801716	12.5	21	33	119	100	5	1.09
	SK40AD/B-M16-5	P2801718	17	29	29	24	5	5	0.77
	SK40AD/B-M16-25	P2801719	17	29	29	44	25	5	0.85
	SK40AD/B-M16-50	P2801720	17	29	34	69	50	5	1.00
	SK40AD/B-M16-75	P2801721	17	29	34	94	75	5	0.99
	SK40AD/B-M16-100	P2801722	17	29	36	119	100	5	1.34
	SK40AD/B-M16-150	P2801723	17	29	42.5	169	150	5	1.84
50	SK50AD/B-M16-50	P2801731	17	29	34	69	50	5	2.79
	SK50AD/B-M16-100	P2801732	17	29	36	119	100	10	3.00
	SK50AD/B-M16-150	P2801733	17	29	42.5	169	150	10	3.60

▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
▶ For the screw in milling cutters with thread.

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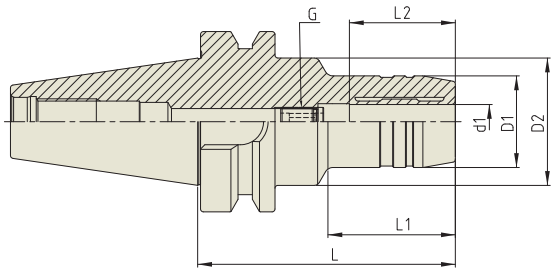
HYDRAULIC CHUCK (Standard)

HC



CBT | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	G	FIG.	WEIGHT (Kg)
40	CBT40-HC12-90	P2770501	12	32	44.5	90	44.5	37	M10x1.0	2	1.35
	CBT40-HC20-90	P2770502	20	42	44.5	90	47.5	42	M16x1.0	2	1.50

- For applic.able hydraulic chuck colleet, please refer to page 80-82.
- Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
- Supplied with clamping T-wrench.

SHRINK FIT HOLDER

SFH

FIG.1

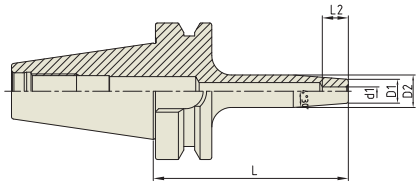
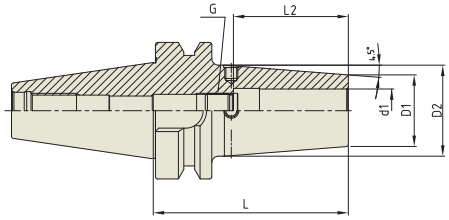


FIG.2



CBT | AT3 | 2.5G | 25,000 RPM | (LD) ≤3μm | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	FIG.	WEIGHT (Kg)
30	CBT30-SFH4-80	P2771563	4	11	15	80	12	-	1	-
	CBT30-SFH6-80	P2771561	6	21	27	80	36	M5×0.8	2	-
	CBT30-SFH8-80	P2771554	8	21	27	80	36	M6×1.0	2	-
	CBT30-SFH10-80	P2771510	10	24	32	80	41	M8×1.0	2	0.40
	CBT30-SFH12-80	P2771511	12	24	32	80	48	M10×1.0	2	0.42
	CBT30-SFH14-80	P2771512	14	27	34	80	48	M10×1.0	2	0.42
	CBT30-SFH20-80	P2771562	20	33	42	80	53	M16×1.0	2	0.44

- Supplied without balancing screw.
- Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.

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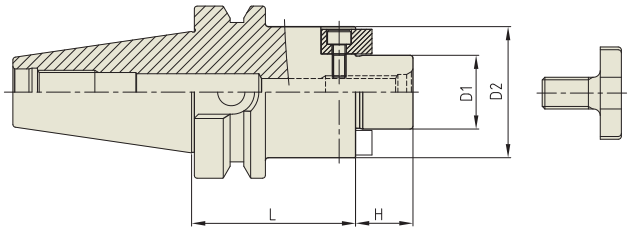
SHELL MILL ARBOR (Small Face) — SMA



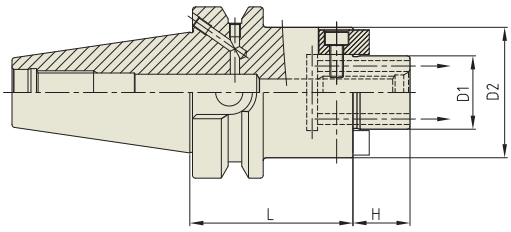
CBT | AT3 | 2.5G | 25,000 RPM | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	D1	D2	L	H	BOLT	WEIGHT (Kg)
40	CBT40-SMA27-60	P2778706	27	48	60	21	M12x22L	1.48
	CBT40-SMA32-60	P2778707	32	58	60	24	M16x26L	1.72

▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.

SHELL MILL ARBOR (Coolant Channel & Small Face) — SMA



CBT | AT3 | 2.5G | 25,000 RPM | AD/B+C

Unit : mm

TAPER No.	MODEL No.	EDP No.	D1	D2	L	H	BOLT	WEIGHT (Kg)
40	CBT40AD/B-SMA22C-60	P2801048C	22	40	60	19	M10x18L	1.27
	CBT40AD/B-SMA27C-60	P2801049C	27	48	60	21	M12x22L	1.44
	CBT40AD/B-SMA32C-60	P2801050C	32	58	60	24	M16x26L	-

▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
▶ With "Coolant Through" by coolant channels.

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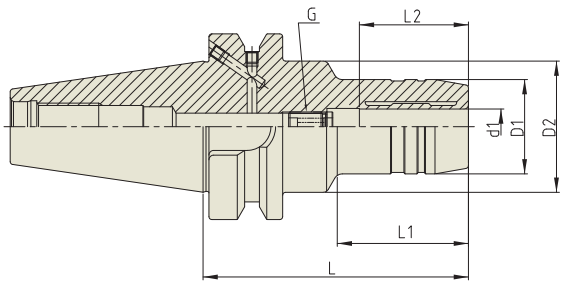
HYDRAULIC CHUCK (Standard)

HC



Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	G	WEIGHT (Kg)
40	BT40AD/B-HC6-90	P2554003	6	26	44.5	90	43	27	M5x0.8	1.30
	BT40AD/B-HC8-90	P2554021	8	28	44.5	90	44.5	27	M6x1.0	1.30
	BT40AD/B-HC10-90	P2554005	10	30	44.5	90	44.5	32	M8x1.0	1.35
	BT40AD/B-HC12-90	P2554002	12	32	44.5	90	44.5	37	M10x1.0	1.35
	BT40AD/B-HC16-90	P2554006	16	38	44.5	90	47.5	42	M12x1.0	1.40
	BT40AD/B-HC20-90	P2554007	20	42	44.5	90	47.5	42	M16x1.0	1.50
	BT40AD/B-HC25-100	P2770641	25	50	60	100	47.5	48	M16x1.0	1.70
	BT40AD/B-HC32-105	P2770612	32	60	-	105	-	55	M16x1.0	2.10

- For applic.able hydraulic chuck colleet, please refer to page 80-82.
- Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
- Supplied with clamping T-wrench.

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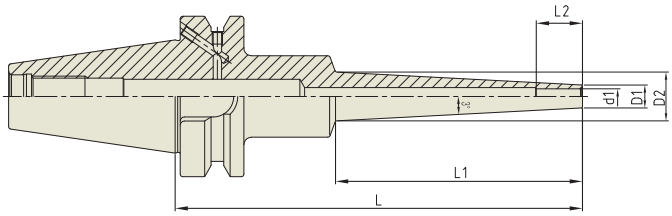
SHRINK FIT HOLDER (Extra Slim)

SFHS



JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | (LD) ≤3μm | AD/B

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	WEIGHT (Kg)
40	BT40AD/B-SFHS3-95	P2779860S	3	6	25	95	42	9	-
	BT40AD/B-SFHS3-120	P2779861S	3	6	25	120	67	9	-
	BT40AD/B-SFHS4-95	P2779863S	4	7	25	95	42	12	-
	BT40AD/B-SFHS4-120	P2779864S	4	7	25	120	67	12	-
	BT40AD/B-SFHS6-95	P2779866S	6	9	25	95	42	18	-
	BT40AD/B-SFHS6-120	P2779867S	6	9	25	120	67	18	-
	BT40AD/B-SFHS6-160	P2779868S	6	9	32	160	97	18	-
	BT40AD/B-SFHS8-95	P2779869S	8	11	25	95	42	24	-
	BT40AD/B-SFHS8-120	P2779870S	8	11	32	120	67	24	-
	BT40AD/B-SFHS8-160	P2779871S	8	11	32	160	97	24	-
	BT40AD/B-SFHS10-95	P2779872S	10	13	25	95	42	30	-
	BT40AD/B-SFHS10-120	P2779873S	10	13	32	120	67	30	-
	BT40AD/B-SFHS12-95	P2779875S	12	15	32	95	42	30	-
	BT40AD/B-SFHS12-120	P2779876S	12	15	32	120	67	30	-

▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.

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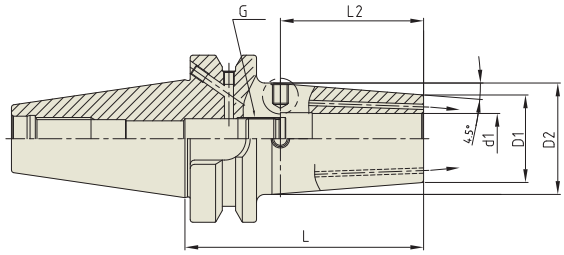
SHRINK FIT HOLDER (Coolant Channel)

SFHC



JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | (LD) ≤3μm | AD/B+C

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	WEIGHT (Kg)
40	BT40AD/B-SFH6C-90	P2862085C	6	21	27	90	36	M5x0.8	1.10
	BT40AD/B-SFH6C-160	P2862086C	6	21	27	160	36	M5x0.8	1.15
	BT40AD/B-SFH8C-90	P2862087C	8	21	27	90	36	M6x1.0	1.11
	BT40AD/B-SFH8C-160	P2862088C	8	21	27	160	36	M6x1.0	1.15
	BT40AD/B-SFH10C-90	P2862089C	10	24	32	90	41	M8x1.0	1.10
	BT40AD/B-SFH10C-160	P2862090C	10	24	32	160	41	M8x1.0	1.15
	BT40AD/B-SFH12C-90	P2862091C	12	24	32	90	47	M10x1.0	1.10
	BT40AD/B-SFH12C-160	P2862092C	12	24	32	160	47	M10x1.0	1.15
	BT40AD/B-SFH14C-90	P2862093C	14	27	34	90	47	M10x1.0	1.20
	BT40AD/B-SFH14C-160	P2862094C	14	27	34	160	47	M10x1.0	1.50
	BT40AD/B-SFH16C-90	P2862095C	16	27	34	90	50	M12x1.0	1.20
	BT40AD/B-SFH16C-160	P2862096C	16	27	34	160	50	M12x1.0	1.50
	BT40AD/B-SFH18C-90	P2862097C	18	33	42	90	50	M12x1.0	1.30
	BT40AD/B-SFH20C-90	P2862099C	20	33	42	90	52	M16x1.0	1.40
	BT40AD/B-SFH20C-160	P2862100C	20	33	42	160	52	M16x1.0	1.70
	BT40AD/B-SFH25C-100	P2862101C	25	44	53	100	58	M16x1.0	1.70
	BT40AD/B-SFH25C-160	P2862102C	25	44	53	160	58	M16x1.0	2.00
50	BT50AD/B-SFH6C-100	P2862103C	6	21	27	100	36	M5x0.8	1.50
	BT50AD/B-SFH6C-160	P2862104C	6	21	27	160	36	M5x0.8	2.00
	BT50AD/B-SFH8C-100	P2862105C	8	21	27	100	36	M6x1.0	1.50
	BT50AD/B-SFH8C-160	P2862106C	8	21	27	160	36	M6x1.0	2.00
	BT50AD/B-SFH10C-100	P2862107C	10	24	32	100	42	M8x1.0	1.10
	BT50AD/B-SFH10C-160	P2862108C	10	24	32	160	42	M8x1.0	1.15
	BT50AD/B-SFH12C-100	P2862109C	12	24	32	100	47	M10x1.0	1.60
	BT50AD/B-SFH12C-160	P2862110C	12	24	32	160	47	M10x1.0	2.10
	BT50AD/B-SFH16C-100	P2862113C	16	27	34	100	50	M12x1.0	1.60
	BT50AD/B-SFH16C-160	P2862114C	16	27	34	160	50	M12x1.0	2.10

- Supplied without balancing screw.
- Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
- With two coolant channel bores.
- Resealable coolant channel type is available upon request.
  (Thread for plugging screws & 2 screws)

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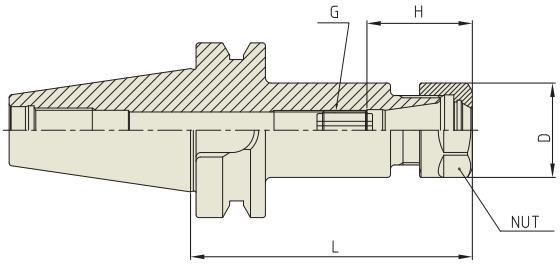
ER COLLET CHUCK

ER



JIS B6339-BT | AT3 | 6.3G | 15,000 RPM | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	G	H	NUT/ COLLET	WEIGHT (Kg)
30	BT30-ER16-100	P2772110	0.5 - 10.0	100	28	M12	45	ER16	1.10
	BT30-ER20-80	P2772111	0.5 - 13.0	80	34	M12	50	ER20	1.20
	BT30-ER20-100	P2772112	0.5 - 13.0	100	34	M12	50	ER20	1.30
	BT30-ER32-60	P2772144	1.0 - 20.0	60	50	M12	65	ER32	1.40
	BT30-ER32-90	P2772115	1.0 - 20.0	90	50	M12	65	ER32	1.90
40	BT40-ER11-75	P2772116	0.5 - 7.0	75	19	M6	45	ER11	1.00
	BT40-ER16-75	P2772101	0.5 - 10.0	75	28	M12	45	ER16	1.10
	BT40-ER16-100	P2772118	0.5 - 10.0	100	28	M12	45	ER16	1.20
	BT40-ER16-120	P2772119	0.5 - 10.0	120	28	M12	45	ER16	1.40
	BT40-ER20-75	P2772102	0.5 - 13.0	75	34	M12	50	ER20	1.40
	BT40-ER20-100	P2772120	0.5 - 13.0	100	34	M12	50	ER20	1.80
	BT40-ER25-75	P2772103	1.0 - 16.0	75	42	M12	65	ER25	1.40
	BT40-ER25-100	P2772122	1.0 - 16.0	100	42	M12	65	ER25	1.80
	BT40-ER25-135	P2772123	1.0 - 16.0	135	42	M12	65	ER25	2.20
	BT40-ER25-150	P2772124	1.0 - 16.0	150	42	M12	65	ER25	2.40
	BT40-ER32-60	P2772104	1.0 - 20.0	60	50	M12	65	ER32	1.80
	BT40-ER32-100	P2772125	1.0 - 20.0	100	50	M12	65	ER32	2.20
	BT40-ER32-120	P2772105	1.0 - 20.0	120	50	M12	65	ER32	2.40
	BT40-ER32-150	P2772126	1.0 - 20.0	150	50	M12	65	ER32	2.60
	BT40-ER40-80	P2772127	2.0 - 30.0	80	63	M12	75	ER40	1.50
50	BT50-ER16-100	P2772128	0.5 - 10.0	100	28	M12	45	ER16	4.20
	BT50-ER16-165	P2772130	0.5 - 10.0	165	28	M12	45	ER16	4.60
	BT50-ER20-135	P2772132	0.5 - 13.0	135	34	M12	50	ER20	4.80
	BT50-ER25-100	P2772134	1.0 - 16.0	100	42	M12	65	ER25	4.70
	BT50-ER25-165	P2772136	1.0 - 16.0	165	42	M12	65	ER25	5.00
	BT50-ER32-100	P2772137	1.0 - 20.0	100	50	M12	65	ER32	5.20
	BT50-ER32-165	P2772139	1.0 - 20.0	165	50	M12	65	ER32	5.80
	BT50-ER40-100	P2772140	2.0 - 30.0	100	63	M12	75	ER40	5.60
	BT50-ER40-150	P2772141	2.0 - 30.0	150	63	M12	75	ER40	6.10

▶ For applic.able ER collet, please refer to page 83-92.
▶ For applic.able ER nut, please refer to page 93, Sealing disk & spanner page 94-95.

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END MILL HOLDER

EMH

JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | AD/B

FIG.1

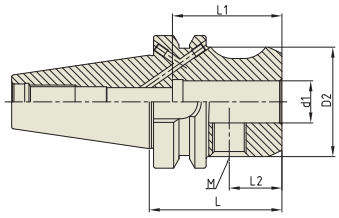
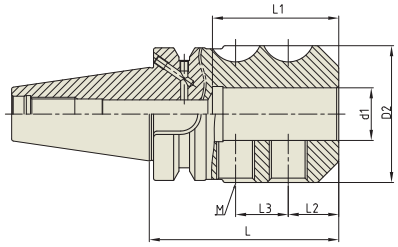


FIG.2



Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	FIG.	WEIGHT (Kg)
40	BT40AD/B-EMH6-50	P2773031	6	25	50	35	18	-	M6	1	1.00
	BT40AD/B-EMH8-50	P2773032	8	28	50	35	18	-	M8	1	1.00
	BT40AD/B-EMH10-63	P2773033	10	35	63	39	20	-	M10	1	1.10
	BT40AD/B-EMH12-63	P2773034	12	42	63	44	22.5	-	M12	1	1.30
	BT40AD/B-EMH16-63	P2773036	16	48	63	52	24	-	M14	1	1.70
	BT40AD/B-EMH20-63	P2773038	20	52	63	52	25	-	M16	1	1.80
	BT40AD/B-EMH25-90	P2773039	25	65	90	60	24	25	M18	2	1.80
	BT40AD/B-EMH32-100	P2773040	32	72	100	64	24	28	M20	2	2.00
50	BT50AD/B-EMH16-80	P2773046	16	48	80	49	24	-	M14	1	4.00
	BT50AD/B-EMH20-80	P2773048	20	52	80	52	25	-	M16	1	4.20
	BT50AD/B-EMH25-100	P2773049	25	65	100	60	24	25	M18	2	4.60
	BT50AD/B-EMH32-105	P2773050	32	72	105	64	24	28	M20	2	4.70

- Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
- Standard End Mill Holder is for a cutting tool with Weldon shank and End Mill Holder for a cutting tool with Whistle notch shank is available upon request.
- Combi-style holder with ball jointed clamping screw which can be used with cutting tools with weldon and Whistle notch shank is available.

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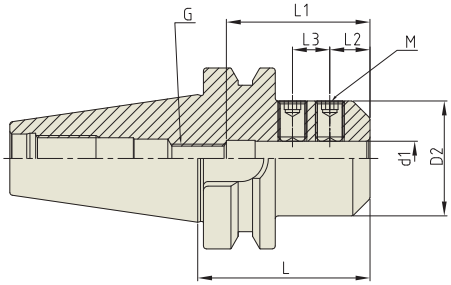
SIDE LOCK ARBOR

SLA



JIS B6339-BT | AT3 | AD

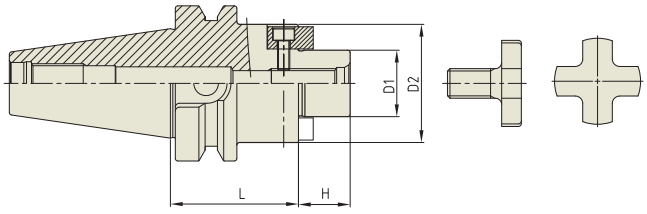
Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	G	WEIGHT (Kg)
40	**BT40-SLA16-90**	**P2780214**	16	40	90	70	25	20	M12	M12	1.50

▶ Standard design of Side Lock Arbor is for cutting tools with straight shank having flat face.
▶ Side Lock Arbor is non balancing.

SHELL MILL ARBOR (Small Face)

SMA



JIS B6339-BT | AT3 | 6.3G | 15,000 RPM | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	D1	D2	L	H	BOLT	WEIGHT (Kg)
40	**BT40-SMA32-60**	**P2778807**	32	58	60	24	M16x26L	1.72
50	**BT50-SMA16-75**	**P2778809**	16	32	75	17	M8x16L	3.75
	BT50-SMA27-75	**P2778811**	27	48	75	21	M12x22L	4.09
	BT50-SMA27-120	**P2778821**	27	48	120	21	M12x22L	4.56
	BT50-SMA32-75	**P2778812**	32	58	75	24	M16x26L	4.35

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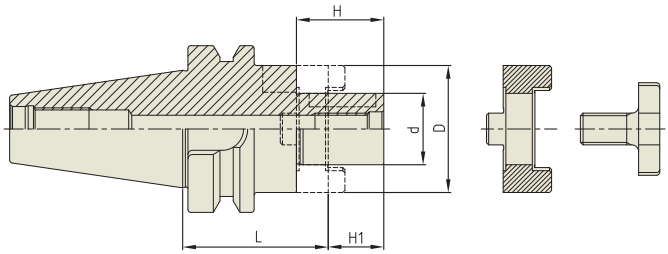
COMBI SHELL MILL ARBOR

CMA



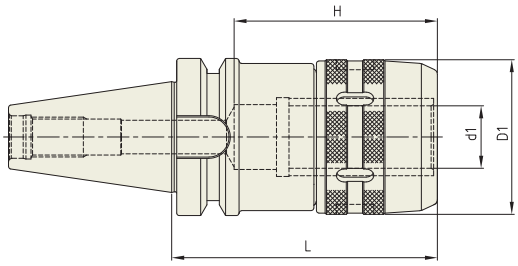
JIS B6339-BT | AT3 | 6.3G | 15,000 RPM | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d	D	L	H1	H	WEIGHT (Kg)
40	BT40-CMA16-55	P2544004	16	32	55	17	27	1.14
	BT40-CMA22-55	P2544005	22	40	55	19	31	1.26
	BT40-CMA27-55	P2544006	27	48	55	21	33	1.42
	BT40-CMA32-60	P2544007	32	58	60	24	38	1.72

POWER MILLING CHUCK

C



JIS B6339-BT | AT3 | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	L	H	WEIGHT (Kg)
40	BT40-C20-80	P2546003	20	54	80	70	2.00
	BT40-C20-105	P2546004	20	54	105	70	2.10
	BT40-C32-90	P2546006	32	72	90	100	3.00

▶ For applic.able collet, spanner, please refer to page 95.
▶ Balancing grade is adjusted on Basic holder only without Clamping Cap.

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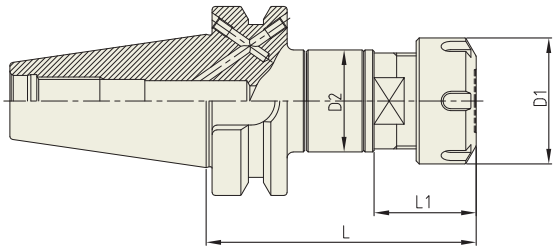
SYNCHRO TAPPING CHUCK (ER Type)

SYTER



JIS B6339-BT | AT3 | AD/B

Unit : mm

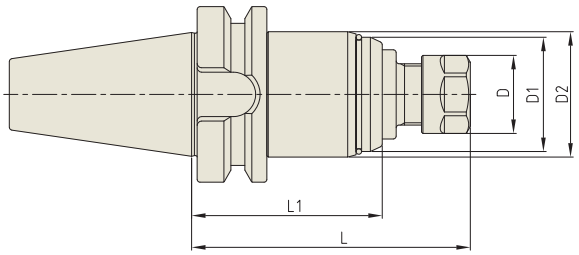
TAPER No.	MODEL No.	EDP No.	TAP SIZE	NUT/ COLLET	D1	D2	L	L1	Tension/ Compression	WEIGHT (Kg)
40	BT40AD/B-SYTER12-79	P2776301	M2-M8	ER16	28	34	79	26	±0.2	1.14
	BT40AD/B-SYTER16-85	P2776302	M3-M10	ER20	34	34	85	27	±0.2	1.17
	BT40AD/B-SYTER20-90	P2776303	M3-M14	ER25	42	34	90	34	±0.2	1.17
	BT40AD/B-SYTER27-100	P2776304	M4-M18	ER32	50	45	100	31	±0.2	1.45
50	BT50AD/B-SYTER27-110	P2776309	M4-M18	ER32	50	45	110	31	±0.2	3.99

▶ Feature :
- Compensation for synchronization error to extend tap life and to improve thread quality.
- To compensate for pitch tolerance of taps.
- For Machine with asynchronized spindle.

▶ ER collet of page 83-90 and Tap ER collet of page 91-92.

TAPPING ER CHUCK

TER



JIS B6339-BT | AT3

Unit : mm

TAPER No.	MODEL No.	EDP No.	TAP SIZE	NUT/ COLLET	D	D1	L	L1	WEIGHT (Kg)
40	BT40-TER16-100	P2774159	M3-M12	ER16	28	45	100	68.4	1.45
	BT40-TER32-110	P2774161	M4-M27	ER32	50	63	110	72	2.20

▶ ER collet of page 83-90 and Tap ER collet of page 91-92.

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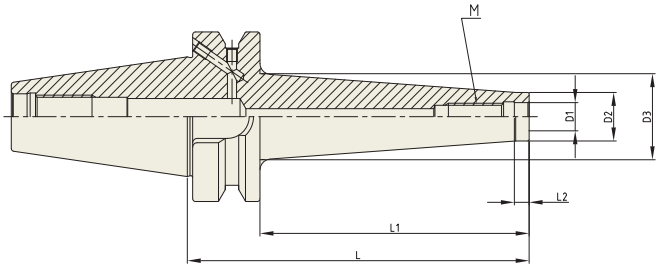
COPY MILL ARBOR

M



JIS B6339-BT | AT3 | 2.5G | 25,000 RPM | (LD) ≤3㎛ | AD/B

Unit : mm

TAPER No.	MODEL No. (M-L1)	EDP No.	D1	D2	D3	L	L1	L2	WEIGHT (Kg)
40	BT40AD/B-M6-25	P2801901	6.5	10	13	52	25	5	0.94
	BT40AD/B-M6-50	P2801902	6.5	10	20	77	50	5	0.99
	BT40AD/B-M6-75	P2801903	6.5	10	23	102	75	5	1.04
	BT40AD/B-M10-25	P2801907	10.5	18	20	52	25	5	0.97
	BT40AD/B-M10-50	P2801908	10.5	18	23	77	50	5	1.04
	BT40AD/B-M10-75	P2801909	10.5	18	32	102	75	5	1.28
	BT40AD/B-M16-25	P2801913	17	29	29	52	25	5	1.01
	BT40AD/B-M16-75	P2801914	17	29	34	102	75	5	1.32
	BT40AD/B-M16-125	P2801915	17	29	40	152	125	5	1.75
50	BT50AD/B-M16-50	P2801921	17	29	29	88	50	10	3.63
	BT50AD/B-M16-100	P2801922	17	29	36	138	100	10	3.98
	BT50AD/B-M16-150	P2801923	17	29	42.5	188	150	10	4.48

▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
▶ For the screw in milling cutters with thread.

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HYDRAULIC CHUCK (Power E Hydro) HCP

FIG.1

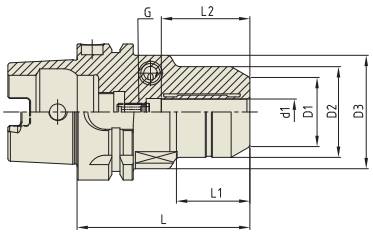
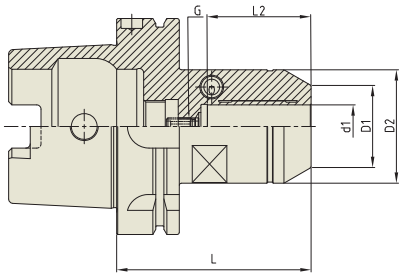


FIG.2



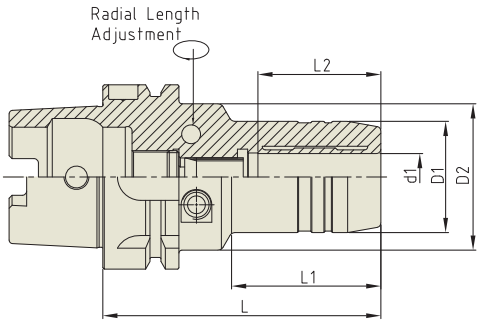
DIN 69893-HSK | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	D3	L	L1	L2	G	FIG.	WEIGHT (Kg)
63A	HSK63A-HC12P-80	P2770302P	12	32	42	52.5	80	34	41	M8x1.0	1	1.20
	HSK63A-HC20P-80	P2770301P	20	38	52.5	-	80	-	48	M8x1.0	2	1.30
100A	HSK100A-HC20P-90	P2770303P	20	38	52.5	-	90	-	48	M8x1.0	2	2.80
	HSK100A-HC32P-100	P2770304P	32	58.5	72	-	100	-	57	M8x1.0	2	3.70

- For applicable hydraulic chuck collet, please refer to page 80-82.
- Balancing grade G2.5 at 25,000 RPM or U max < 1 gmm.
- Supplied with clamping T-wrench.

HYDRAULIC CHUCK (Radial Tool Length Pre-setting Type) HCR



DIN 69893-HSK | AT3 | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	WEIGHT (Kg)
63A	HSK63A-HCR6-80	P2770205	6	26	50	80	33	27	0.96
	HSK63A-HCR12-90	P2567011	12	32	50	90	40	37	1.06
	HSK63A-HCR20-100	P2567012	20	42	50	100	51	42	1.22
100A	HSK100A-HCR32-120	P2770231	32	64	75	120	63.5	55	4.60

- For applicable hydraulic chuck collet, please refer to page 80-82.
- Balancing grade G2.5 at 25,000 RPM or U max < 1 gmm.
- Supplied with clamping T-wrench.

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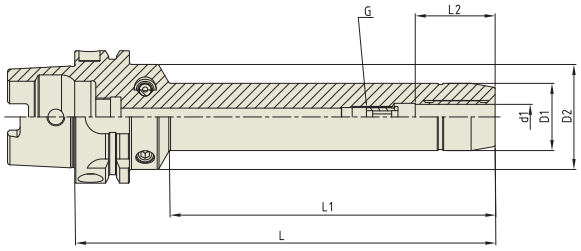
HYDRAULIC CHUCK (Long & Slim)

HC-LS



DIN 69893-HSK | 2.5G | 25,000 RPM | (at 3D) ≤3μm | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	L2	G	WEIGHT (Kg)
63A	HSK63A-HC6LS-150	P2770469	6	26	50	150	103.0	27	M5×0.8	1.40
	HSK63A-HC6LS-200	P2770470	6	26	50	200	153.0	27	M5×0.8	1.60
	HSK63A-HC8LS-150	P2770471	8	28	50	150	104.0	27	M6×1.0	1.40
	HSK63A-HC8LS-200	P2770472	8	28	50	200	154.0	27	M6×1.0	1.60
	HSK63A-HC10LS-150	P2770473	10	30	50	150	104.0	31	M8×1.0	1.50
	HSK63A-HC10LS-200	P2770474	10	30	50	200	154.0	31	M8×1.0	1.70
	HSK63A-HC12LS-150	P2770475	12	32	50	150	105.0	36	M10×1.0	1.50
	HSK63A-HC12LS-200	P2770476	12	32	50	200	155.0	36	M10×1.0	1.80
	HSK63A-HC14LS-150	P2770477	14	34	50	150	105.0	36	M10×1.0	1.60
	HSK63A-HC16LS-150	P2770478	16	38	50	150	156.0	39	M12×1.0	1.80
	HSK63A-HC16LS-200	P2770479	16	38	50	200	156.0	39	M12×1.0	2.20
	HSK63A-HC18LS-150	P2770480	18	40	50	150	107.0	39	M12×1.0	1.80
	HSK63A-HC20LS-150	P2770481	20	42	50	150	108.0	41	M16×1.0	1.90
	HSK63A-HC20LS-200	P2770482	20	42	50	200	158.0	41	M16×1.0	2.40

▶ For applicable hydraulic chuck collet, please refer to page 80-82.
▶ Balancing grade G2.5 at 25,000 RPM or U max < 1 gmm.
▶ Supplied with clamping T-wrench.

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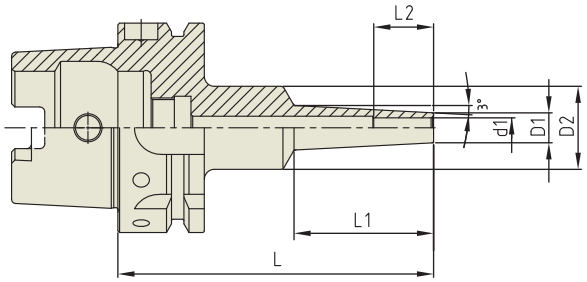
SHRINK FIT HOLDER (Extra Slim)

SFHS



DIN 69893-HSK | 2.5G | 25,000 RPM | (I.D) ≤3㎛ | AD

Unit : mm

TAPER No.	MODEL No.	EDP CODE	d1	D1	D2	L	L1	L2	WEIGHT (Kg)
63A	HSK63A-SFHS4-95	P2779819S	4	7	25	95	42	12	0.75
	HSK63A-SFHS4-120	P2779820S	4	7	25	120	67	12	0.78
	HSK63A-SFHS6-95	P2779821S	6	9	25	95	42	18	0.76
	HSK63A-SFHS6-120	P2779822S	6	9	25	120	97	18	0.78
	HSK63A-SFHS8-95	P2779823S	8	11	25	95	42	24	0.75
	HSK63A-SFHS8-160	P2779824S	8	11	32	160	97	24	0.97
	HSK63A-SFHS10-95	P2779825S	10	13	25	95	42	30	0.76
	HSK63A-SFHS10-160	P2779826S	10	13	32	160	97	30	1.00
	HSK63A-SFHS12-95	P2779827S	12	15	32	95	42	30	0.83
	HSK63A-SFHS12-160	P2779828S	12	15	32	160	97	30	1.04

▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.

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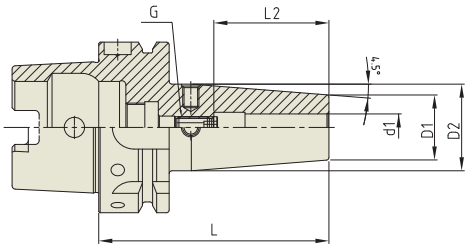
SHRINK FIT HOLDER

SFH



DIN 69893-HSK | 2.5G | 25,000 RPM | (I.D) ≤3μm | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	WEIGHT (Kg)
63A	HSK63A-SFH20-100	P2600005	20	33	42	100	52	M16×1.0	1.00
	HSK63A-SFH20-120	P2600006	20	33	42	120	52	M16×1.0	-
	HSK63A-SFH20-160	P2565055	20	33	42	160	52	M16×1.0	1.40
	HSK63A-SFH20-200	P2860072	20	33	42	200	52	M16×1.0	-
	HSK63A-SFH25-115	P2771458	25	44	53	115	58	M16×1.0	1.40
	HSK63A-SFH25-160	P2771459	25	44	53	160	58	M16×1.0	1.80
	HSK63A-SFH25-200	P2860073	25	44	53	200	58	M16×1.0	-
	HSK63A-SFH32-120	P2860076	32	44	53	120	58	M16×1.0	-
	HSK63A-SFH32-160	P2860077	32	44	53	160	58	M16×1.0	-
	HSK63A-SFH32-200	P2860078	32	44	53	200	58	M16×1.0	-

▶ Supplied without balancing screw.
▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.

▶ NEXT PAGE

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SHRINK FIT HOLDER (Coolant Channel)

SFHC

DIN 69893-HSK | 2.5G | 25,000 RPM | (LD) ≤3μm | AD+C

FIG.1

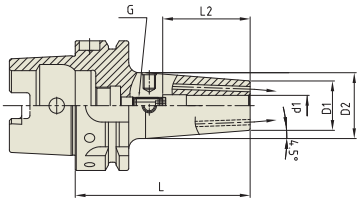
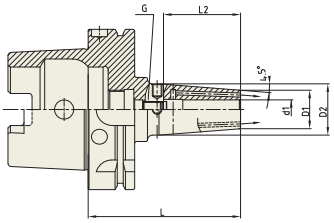


FIG.2



Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L2	G	FIG.	WEIGHT (Kg)
63A	HSK63A-SFH6C-80	P2862013C	6	21	27	80	36	M5x0.8	1	0.83
	HSK63A-SFH6C-120	P2863431C	6	21	27	120	36	M5x0.8	1	-
	HSK63A-SFH6C-160	P2862014C	6	21	27	160	36	M5x0.8	1	1.00
	HSK63A-SFH8C-80	P2862015C	8	21	27	80	36	M6x1.0	1	0.83
	HSK63A-SFH8C-120	P2862129C	8	21	27	120	36	M6x1.0	1	-
	HSK63A-SFH8C-160	P2862016C	8	21	27	160	36	M6x1.0	1	1.00
	HSK63A-SFH10C-85	P2862017C	10	24	32	85	42	M8x1.0	1	0.83
	HSK63A-SFH10C-120	P2862130C	10	24	32	120	42	M8x1.0	1	-
	HSK63A-SFH10C-160	P2862018C	10	24	32	160	42	M8x1.0	1	1.00
	HSK63A-SFH12C-90	P2862019C	12	24	32	90	47	M10x1.0	1	0.83
	HSK63A-SFH12C-120	P2863427C	12	24	32	120	47	M10x1.0	1	-
	HSK63A-SFH12C-160	P2862020C	12	24	32	160	47	M10x1.0	1	1.00
	HSK63A-SFH16C-95	P2862023C	16	27	34	95	50	M12x1.0	1	0.98
	HSK63A-SFH16C-120	P2863428C	16	27	34	120	50	M12x1.0	1	-
	HSK63A-SFH16C-160	P2862024C	16	27	34	160	50	M12x1.0	1	1.40
	HSK63A-SFH20C-100	P2862027C	20	33	42	100	52	M16x1.0	1	1.00
	HSK63A-SFH20C-120	P2863429C	20	33	42	120	52	M16x1.0	1	-
	HSK63A-SFH20C-160	P2862028C	20	33	42	160	52	M16x1.0	1	1.40
	HSK63A-SFH25C-115	P2862029C	25	44	53	115	58	M16x1.0	1	1.40
	HSK63A-SFH25C-160	P2862030C	25	44	53	160	58	M16x1.0	1	1.80
	HSK63A-SFH32C-120	P2863430C	32	44	53	160	58	M16x1.0	1	-
100A	HSK100A-SFH6C-85	P2862031C	6	21	27	85	36	M5x0.8	2	1.30
	HSK100A-SFH6C-160	P2862032C	6	21	27	160	36	M5x0.8	2	1.80
	HSK100A-SFH8C-85	P2862033C	8	21	27	85	36	M6x1.0	2	1.30
	HSK100A-SFH8C-160	P2862034C	8	21	27	160	36	M6x1.0	2	1.80
	HSK100A-SFH10C-90	P2862035C	10	24	32	90	42	M8x1.0	2	1.30
	HSK100A-SFH12C-95	P2862037C	12	24	32	95	47	M10x1.0	2	1.30
	HSK100A-SFH12C-160	P2862038C	12	24	32	160	47	M10x1.0	2	1.80
	HSK100A-SFH16C-100	P2862041C	16	27	34	100	50	M12x1.0	2	1.40
	HSK100A-SFH16C-160	P2862042C	16	27	34	160	50	M12x1.0	2	1.90
	HSK100A-SFH20C-100	P2862045C	20	33	42	100	52	M16x1.0	1	1.50
	HSK100A-SFH20C-160	P2862046C	20	33	42	160	52	M16x1.0	1	2.00
	HSK100A-SFH25C-115	P2862047C	25	44	53	115	58	M16x1.0	1	1.80
	HSK100A-SFH25C-160	P2862048C	25	44	53	160	58	M16x1.0	1	2.30

- Supplied without balancing screw.
- Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
- With two coolant channel bores.
- Resealable coolant channel type is available upon request. (Thread for plugging screws & 2 screws)

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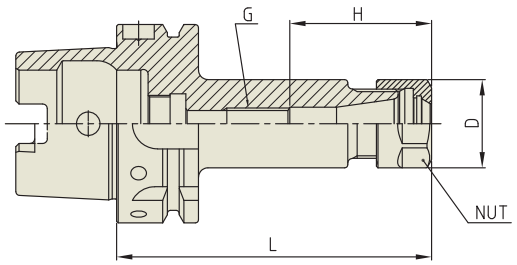
ER COLLET CHUCK

ER



DIN 69893-HSK | 6.3G | 15,000 RPM | AD

Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	L	D	G	H	NUT/ COLLET	WEIGHT (Kg)
63A	HSK63A-ER16-100	P2564001	0.5 - 10.0	100	28	M12	45	ER16	1.20
	HSK63A-ER25-100	P2564002	1.0 - 16.0	100	42	M12	57	ER25	1.80
	HSK63A-ER32-100	P2564003	1.0 - 20.0	100	50	M12	47	ER32	2.00
	HSK63A-ER40-120	P2564004	2.0 - 30.0	120	63	M12	69	ER40	2.30
80A	HSK80A-ER32-100	P2771934	1.0 - 20.0	100	50	M12	53	ER25	1.95
100A	HSK100A-ER25-100	P2564012	1.0 - 16.0	100	42	M12	57	ER25	2.90
	HSK100A-ER32-100	P2564013	1.0 - 20.0	100	50	M12	57	ER32	3.10
32E	HSK32E-ER16-60	P2771919	0.5 - 10.0	60	28	M12	41	ER16	-

▶ For applic.able ER collet, please refer to page 83-92.
▶ For applic.able ER nut, please refer to page 93, Sealing disk & spanner page 94-95.

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END MILL HOLDER (Coolant Channel)

EMH

DIN 69893-HSK | 2.5G | 25,000 RPM | AD+C

FIG.1

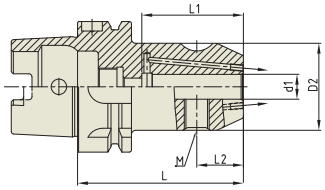
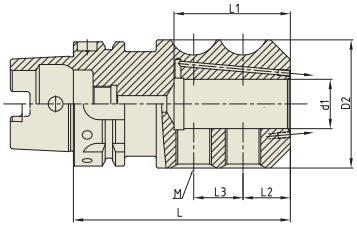


FIG.2



Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D2	L	L1	L2	L3	M	FIG.	WEIGHT (Kg)
63A	HSK63A-EMH6C-65	P2777201	6	25	65	35	18	-	M6	1	0.80
	HSK63A-EMH6C-100	P2777244	6	25	100	35	18	-	M6	1	-
	HSK63A-EMH6C-130	P2777245	6	25	130	35	18	-	M6	1	-
	HSK63A-EMH8C-65	P2777202	8	28	65	40	18	-	M8	1	0.80
	HSK63A-EMH8C-100	P2777246	8	28	100	40	18	-	M8	1	-
	HSK63A-EMH8C-130	P2777247	8	28	130	40	18	-	M8	1	-
	HSK63A-EMH10C-65	P2777203	10	35	65	40.5	20	-	M10	1	0.90
	HSK63A-EMH10C-100	P2777236	10	35	100	40.5	20	-	M10	1	-
	HSK63A-EMH10C-130	P2777237	10	35	130	40.5	20	-	M10	1	-
	HSK63A-EMH12C-80	P2777204	12	42	80	49	22.5	-	M12	1	1.10
	HSK63A-EMH12C-100	P2777238	12	42	100	49	22.5	-	M12	1	-
	HSK63A-EMH12C-130	P2777239	12	42	130	49	22.5	-	M12	1	-
	HSK63A-EMH16C-80	P2777205	16	48	80	52	24	-	M14	1	1.30
	HSK63A-EMH16C-100	P2777240	16	48	100	52	24	-	M14	1	-
	HSK63A-EMH16C-130	P2777241	16	48	130	52	24	-	M14	1	-
	HSK63A-EMH20C-80	P2777208	20	52	80	53	25	-	M16	1	1.50
	HSK63A-EMH20C-100	P2777242	20	52	100	53	25	-	M16	1	-
	HSK63A-EMH20C-130	P2777243	20	52	130	53	25	-	M16	1	-
	HSK63A-EMH25C-110	P2777209	25	65	110	59	24	25	M16	2	2.30
	HSK63A-EMH32C-110	P2777210	32	72	110	63	24	28	M16	2	2.60

- Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
- Standard End Mill Holder is for a cutting tool with Weldon shank and End Mill Holder for a cutting tool with Whistle notch shank is available upon request.
- Combi-style holder with ball jointed clamping screw which can be used with cutting tools with weldon and Whistle notch shank is available.

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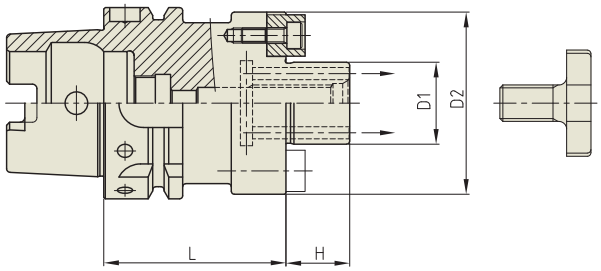
SHELL MILL ARBOR (Coolant Channel & Large Face)

SMA



DIN 69893-HSK | 2.5G | 25,000 RPM | AD+C

Unit : mm

TAPER No.	MODEL No.	EDP No.	D1	D2	L	H	BOLT	WEIGHT (Kg)
63A	HSK63A-SMA16CE-50	P2803328CE	16	38	50	17	M8x16L	0.86
	HSK63A-SMA16CE-100	P2803326CE	16	38	100	17	M8x16L	-
	HSK63A-SMA16CE-160	P2803327CE	16	38	160	17	M8x16L	-
	HSK63A-SMA22CE-50	P2803331CE	22	48	50	19	M10x18L	1.02
	HSK63A-SMA22CE-100	P2803329CE	22	48	100	19	M10x18L	-
	HSK63A-SMA22CE-160	P2803330CE	22	48	160	19	M10x18L	-
	HSK63A-SMA27CE-60	P2803334CE	27	60	60	21	M12x22L	1.39
	HSK63A-SMA27CE-100	P2803332CE	27	60	100	21	M12x22L	-
	HSK63A-SMA27CE-160	P2803333CE	27	60	160	21	M12x22L	-
	HSK63A-SMA32CE-60	P2803337CE	32	78	60	24	M16x26L	1.70
	HSK63A-SMA32CE-100	P2803335CE	32	78	100	24	M16x26L	-
	HSK63A-SMA32CE-160	P2803336CE	32	78	160	24	M16x26L	-
	HSK63A-SMA40CE-60	P2803340CE	40	89	60	27	M20x30L	1.99
	HSK63A-SMA40CE-100	P2803338CE	40	89	100	27	M20x30L	-
	HSK63A-SMA40CE-160	P2803339CE	40	89	160	27	M20x30L	-

▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
▶ With "Coolant Through" by coolant channels.

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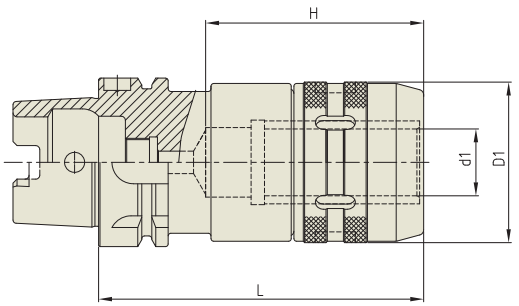
POWER MILLING CHUCK

C



DIN 69893-HSK | AD

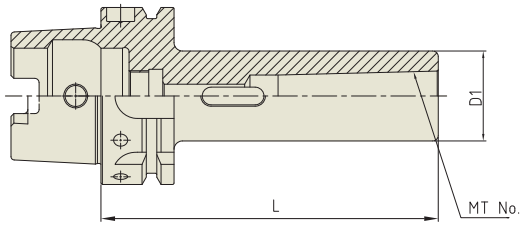
Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	L	H	WEIGHT (Kg)
63A	HSK63A-C20-105	P2773152	20	54	105	70	1.50
	HSK63A-C32-130	P2600032	32	72	130	100	2.70

▶ For applic.able collet, spanner, please refer to page 95.
▶ Balancing grade is adjusted on Basic holder only without Clamping Cap. .

MORSE TAPER ARBOR

MTA



DIN 69893-HSK | 6.3G | 15,000 RPM

Unit : mm

TAPER No.	MODEL No.	EDP No.	MT No.	D1	L	WEIGHT (Kg)
100A	HSK100A-MTA1-110	P2565011	1	25	110	2.12

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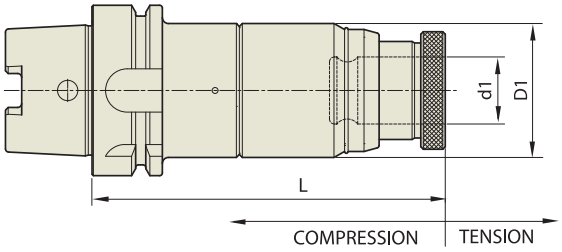
TAPPING CHUCK (Quick Change Type)

TC



DIN 69893-HSK

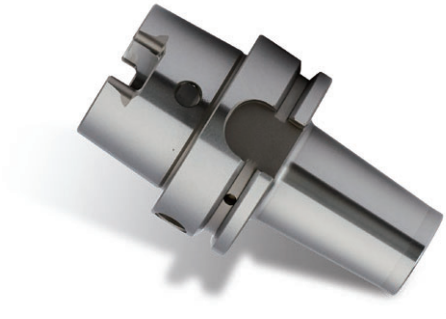
Unit : mm

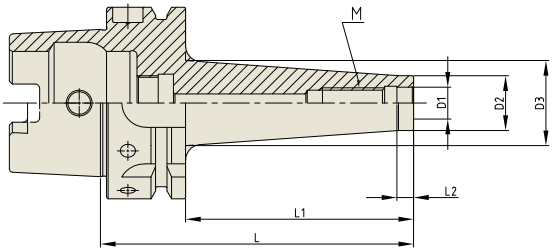
TAPER No.	MODEL No.	EDP No.	TAP SIZE	TAP ADAPTOR	LENGTH COMPENSATION		d1	D1	L	WEIGHT (Kg)
					Compression	Tension				
63A	HSK63A-TC12-120	P2774501	M3-M12	TCS12	5	15	19	45	120	1.00
	HSK63A-TC24-142	P2774502	M6-M24	TCS24	5	20	31	63	142	2.40
100A	HSK100A-TC24-142	P2774504	M6-M24	TCS24	5	20	31	63	187	7.80

▶ For Applicable Tap adaptor, please refer to page 96.

COPY MILL ARBOR

M





DIN 69893-HSK | 2.5G | 25,000 RPM | (I.D) ≤3μm | AD

Unit : mm

TAPER No.	MODEL No. (M-L1)	EDP No.	D1	D2	D3	L	L1	L2	WEIGHT (Kg)
63A	HSK63A-M12-75	P2801813	12.5	21	31	101	75	5	1.92
	HSK63A-M12-100	P2801814	12.5	21	33	126	100	5	2.48
	HSK63A-M16-25	P2801816	17	29	29	51	25	5	0.78
	HSK63A-M16-50	P2801817	17	29	34	76	50	5	1.85
	HSK63A-M16-75	P2801818	17	29	34	101	75	5	2.46
	HSK63A-M16-100	P2801819	17	29	36	126	100	5	3.23
	HSK63A-M16-150	P2801820	17	29	42.5	176	150	5	5.39

▶ Balancing grade G2.5 at 25,000 RPM or U max <1 gmm.
▶ For the screw in milling cutters with thread.

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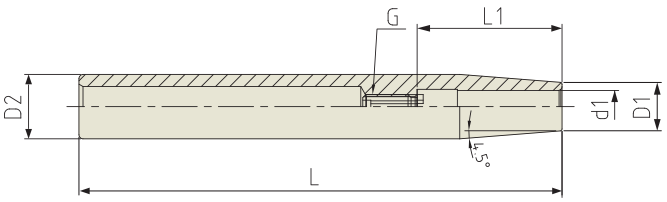
SHRINK FIT HOLDER - EXTENSION

SFH

STRAIGHT



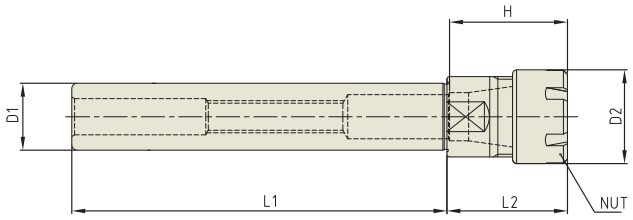
Unit : mm

TAPER No.	MODEL No.	EDP No.	d1	D1	D2	L	L1	G	WEIGHT (Kg)
12	ST12-SFH6-160	P2767030	6	10	12	160	36	M5×0.8	0.13
16	ST16-SFH8-120	P2771711	8	12	16	120	36	M6×1.0	0.12
20	ST20-SFH3-160	P2767210	3	10	20	160	10	-	0.30
	ST20-SFH4-160	P2767215	4	10	20	160	12	-	0.30
	ST20-SFH5-160	P2771708	5	10	20	160	15	-	0.29
	ST20-SFH6-160	P2767220	6	10	20	160	36	M5×0.8	0.29
	ST20-SFH8-160	P2767225	8	12	20	160	36	M6×1.0	0.27
	ST20-SFH10-160	P2767230	10	14	20	160	43	M8×1.0	0.27
	ST20-SFH12-160	P2767235	12	16	20	160	48	M10×1.0	0.23

EXTENSION ER COLLET CHUCK (Slim)

ER

STRAIGHT-K



Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	D1	D2	L1	L2	H	NUT/ COLLET	WEIGHT (Kg)
12	K12-ER8M-70	P2772205	0.5 - 5.0	12	12	70.0	25	38.00	ER8M/ER8	0.10
	K12-ER8M-150	P2780002	0.5 - 5.0	12	12	150.0	25	38.00	ER8M/ER8	0.17
16	K16-ER11M-100	P2780006	0.5 - 7.0	16	16	100.0	32	29.50	ER11M/ER11	0.18
	K16-ER11M-140	P2772206	0.5 - 7.0	16	16	140.0	32	29.50	ER11M/ER11	0.23
20	K20-ER20M-140	P2772208	0.5 - 13.0	20	28	140	41	41.5	ER20M/ER20	0.32
25	K25-ER16M-140	P2772209	0.5 - 10.0	25	22	140	41	-	ER16M / ER16	0.50
	K25-ER20M-140	P2772210	0.5 - 13.0	25	28	140	41	79.0	ER20M / ER20	0.52
	K25-ER25M-140	P2772211	1.0 - 16.0	25	35	140	45	82.0	ER25M/ER25	0.50

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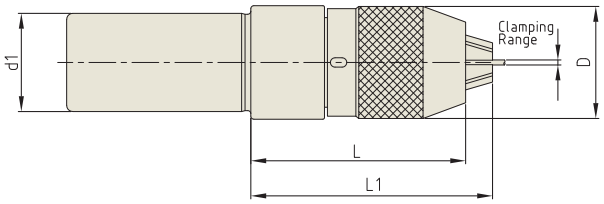
NC DRILL CHUCK (KEYLESS TYPE)

NPU

STRAIGHT-K



Unit : mm

TAPER No.	MODEL No.	EDP No.	CLAMPING RANGE	d1	D	L (Min.)	L1 (Max.)	WEIGHT (Kg)
32	**K32-NPU13-100**	**P2775252**	1.0 - 13	32	50.4	100	110.0	1.50

▶ Supplied with hook wrench. (Size NPU 8 : 8S, NPU 13 : 13S)

HYDRAULIC CHUCK SET

HCS

Unit : mm

MODEL No.	EDP No.	HYDRAULIC CHUCK	REDUCTION SLEEVE	WRENCH
HCSS40-20	**P2770971**	SK40AD/B-HC20P-64.5	HK20-6, 8, 10, 12, 16 (5pcs)	ϕ5mm
HCSB40-20	**P2770972**	BT40AD/B-HC20P-72.5	HK20-6, 8, 10, 12, 16 (5pcs)	ϕ5mm
HCSH40-20	**P2770973**	HSK63A-HC20P-80	HK20-6, 8, 10, 12, 16 (5pcs)	ϕ5mm

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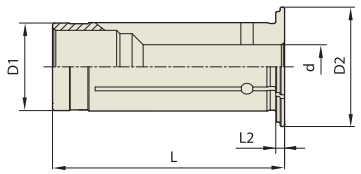
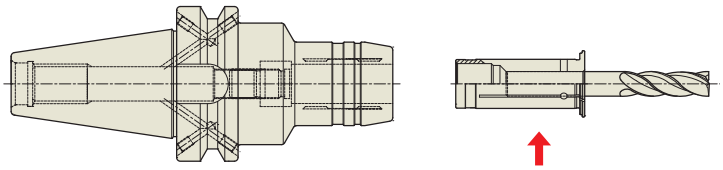
COLLET (Reduction Sleeve : Open Type)

HK





Hydraulic Chuck Collet

Unit : mm

MODEL No.		EDP No.	d	D1	D2	L	L2
HK12	3	P2569022	3	12	19	47	2
	4	P2569023	4	12	19	47	2
	5	P2569024	5	12	19	47	2
	6	P2569025	6	12	19	47	2
	8	P2569026	8	12	19	47	2
HK20	3	P2569001	3	20	27	52.5	2
	4	P2569002	4	20	27	52.5	2
	5	P2569003	5	20	27	52.5	2
	6	P2569004	6	20	27	52.5	2
	8	P2569005	8	20	27	52.5	2
	10	P2569006	10	20	27	52.5	2
	12	P2569007	12	20	27	52.5	2
	13	P2771005	13	20	27	52.5	2
	14	P2569008	14	20	27	52.5	2
	16	P2569009	16	20	27	52.5	2
HK32	6	P2569010	6	32	39	63.5	3
	8	P2569011	8	32	39	63.5	3
	10	P2569012	10	32	39	63.5	3
	12	P2569013	12	32	39	63.5	3
	14	P2569014	14	32	39	63.5	3
	16	P2569015	16	32	39	63.5	3
	18	P2569016	18	32	39	63.5	3
	20	P2569017	20	32	39	63.5	3
	25	P2569018	25	32	39	63.5	3

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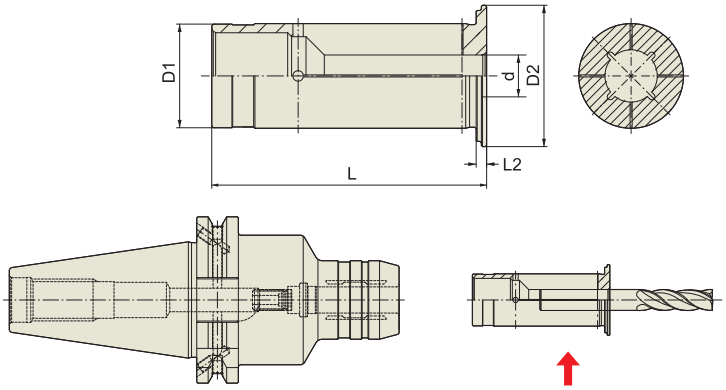
COLLET (Reduction Sleeve : Coolant Flush Type)

HF



Hydraulic Chuck Collet

Unit : mm

MODEL No.		EDP No.	d	D1	D2	L	L2
HF12	3	P2771201	3	12	19	47	2
	4	P2771202	4	12	19	47	2
	5	P2771203	5	12	19	47	2
	6	P2771204	6	12	19	47	2
	7	P2771205	7	12	19	47	2
	8	P2771206	8	12	19	47	2
HF20	3	P2771207	3	20	27	52.5	2
	4	P2771208	4	20	27	52.5	2
	5	P2771209	5	20	27	52.5	2
	6	P2771210	6	20	27	52.5	2
	7	P2771211	7	20	27	52.5	2
	8	P2771212	8	20	27	52.5	2
	9	P2771213	9	20	27	52.5	2
	10	P2771214	10	20	27	52.5	2
	11	P2771215	11	20	27	52.5	2
	12	P2771216	12	20	27	52.5	2
	13	P2771217	13	20	27	52.5	2
	14	P2771218	14	20	27	52.5	2
	15	P2771219	15	20	27	52.5	2
	16	P2771220	16	20	27	52.5	2
HF32	6	P2771221	6	32	39	63.5	3
	8	P2771222	8	32	39	63.5	3
	10	P2771223	10	32	39	63.5	3
	12	P2771224	12	32	39	63.5	3
	14	P2771225	14	32	39	63.5	3
	16	P2771226	16	32	39	63.5	3
	18	P2771227	18	32	39	63.5	3
	20	P2771228	20	32	39	63.5	3
	25	P2771229	25	32	39	63.5	3

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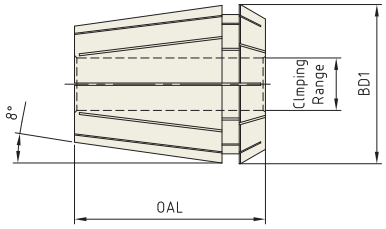
ER COLLET - UF

UF

◇ T.I.R : ≤0.015mm at 3D (I.D 1.0 - 10.0mm)
◇ T.I.R : ≤0.020mm at 3D (I.D >10mm)



Unit : mm

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER20	ER20-1.0	P2506344	1.0 - 0.5	21.0	31.0
	ER20-1.5	P2506345	1.5 - 1.0	21.0	31.0
	ER20-2.0	P2506332	2.0 - 1.5	21.0	31.0
	ER20-2.5	P2506346	2.5 - 2.0	21.0	31.0
	ER20-3.0	P2506333	3.0 - 2.0	21.0	31.0
	ER20-4.0	P2506334	4.0 - 3.0	21.0	31.0
	ER20-5.0	P2506335	5.0 - 4.0	21.0	31.0
	ER20-6.0	P2506336	6.0 - 5.0	21.0	31.0
	ER20-7.0	P2506337	7.0 - 6.0	21.0	31.0
	ER20-8.0	P2506338	8.0 - 7.0	21.0	31.0
	ER20-9.0	P2506339	9.0 - 8.0	21.0	31.0
	ER20-10.0	P2506340	10.0 - 9.0	21.0	31.0
	ER20-11.0	P2506341	11.0 - 10.0	21.0	31.0
	ER20-12.0	P2506342	12.0 - 11.0	21.0	31.0
	ER20-13.0	P2506343	13.0 - 12.0	21.0	31.0
	ER20 SET	P2506304	15 pcs (Ø1.0 - Ø13.0)		

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER25	ER25-1.0	P2506227	1.0 - 0.5	26.0	34.0
	ER25-1.5	P2506228	1.5 - 1.0	26.0	34.0
	ER25-2.0	P2506212	2.0 - 1.5	26.0	34.0
	ER25-2.5	P2506229	2.5 - 2.0	26.0	34.0
	ER25-3.0	P2506213	3.0 - 2.0	26.0	34.0
	ER25-4.0	P2506214	4.0 - 3.0	26.0	34.0
	ER25-5.0	P2506215	5.0 - 4.0	26.0	34.0
	ER25-6.0	P2506216	6.0 - 5.0	26.0	34.0
	ER25-7.0	P2506217	7.0 - 6.0	26.0	34.0
	ER25-8.0	P2506218	8.0 - 7.0	26.0	34.0
	ER25-9.0	P2506219	9.0 - 8.0	26.0	34.0
	ER25-10.0	P2506220	10.0 - 9.0	26.0	34.0
	ER25-11.0	P2506221	11.0 - 10.0	26.0	34.0
	ER25-12.0	P2506222	12.0 - 11.0	26.0	34.0
	ER25-13.0	P2506223	13.0 - 12.0	26.0	34.0
	ER25-14.0	P2506224	14.0 - 13.0	26.0	34.0
	ER25-15.0	P2506225	15.0 - 14.0	26.0	34.0
	ER25-16.0	P2506226	16.0 - 15.0	26.0	34.0
	ER25 SET	P2506305	18 pcs (Ø1.0 - Ø16.0)		

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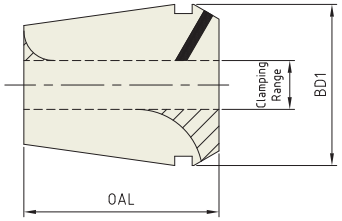
SEALED ER COLLET

ERS



◇ Rubber Sealed

Unit : mm

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER16S	ER16-3.0S	P2506203S	3.0 - 2.0	17.0	27.0
	ER16-4.0S	P2506204S	4.0 - 3.0	17.0	27.0
	ER16-5.0S	P2506205S	5.0 - 4.0	17.0	27.0
	ER16-6.0S	P2506206S	6.0 - 5.0	17.0	27.0
	ER16-7.0S	P2506207S	7.0 - 6.0	17.0	27.0
	ER16-8.0S	P2506208S	8.0 - 7.0	17.0	27.0
	ER16-9.0S	P2506209S	9.0 - 8.0	17.0	27.0
	ER16-10.0S	P2506210S	10.0 - 9.0	17.0	27.0
	ER16S SET	P2506303S	8 pcs (Ø3.0 - Ø10.0)		

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER20S	ER20-3.0S	P2506333S	3.0 - 2.0	21.0	31.0
	ER20-4.0S	P2506334S	4.0 - 3.0	21.0	31.0
	ER20-5.0S	P2506335S	5.0 - 4.0	21.0	31.0
	ER20-6.0S	P2506336S	6.0 - 5.0	21.0	31.0
	ER20-7.0S	P2506337S	7.0 - 6.0	21.0	31.0
	ER20-8.0S	P2506338S	8.0 - 7.0	21.0	31.0
	ER20-9.0S	P2506339S	9.0 - 8.0	21.0	31.0
	ER20-10.0S	P2506340S	10.0 - 9.0	21.0	31.0
	ER20-11.0S	P2506341S	11.0 - 10.0	21.0	31.0
	ER20-12.0S	P2506342S	12.0 - 11.0	21.0	31.0
	ER20-13.0S	P2506343S	13.0 - 12.0	21.0	31.0
	ER20S SET	P2506304S	11 pcs (Ø3.0 - Ø13.0)		

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COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER25S	ER25-3.0S	P2506213S	3.0 - 2.0	26.0	34.0
	ER25-4.0S	P2506214S	4.0 - 3.0	26.0	34.0
	ER25-5.0S	P2506215S	5.0 - 4.0	26.0	34.0
	ER25-6.0S	P2506216S	6.0 - 5.0	26.0	34.0
	ER25-7.0S	P2506217S	7.0 - 6.0	26.0	34.0
	ER25-8.0S	P2506218S	8.0 - 7.0	26.0	34.0
	ER25-9.0S	P2506219S	9.0 - 8.0	26.0	34.0
	ER25-10.0S	P2506220S	10.0 - 9.0	26.0	34.0
	ER25-11.0S	P2506221S	11.0 - 10.0	26.0	34.0
	ER25-12.0S	P2506222S	12.0 - 11.0	26.0	34.0
	ER25-13.0S	P2506223S	13.0 - 12.0	26.0	34.0
	ER25-14.0S	P2506224S	14.0 - 13.0	26.0	34.0
	ER25-15.0S	P2506225S	15.0 - 14.0	26.0	34.0
	ER25-16.0S	P2506226S	16.0 - 15.0	26.0	34.0
	ER25S SET	P2506305S	14 pcs (Ø3.0 - Ø16.0)		

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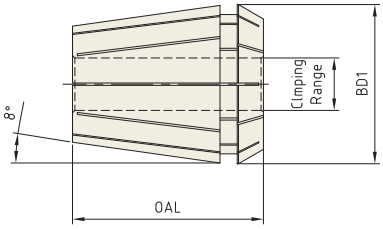
ER COLLET (High Precision)

ER HP

◇ T.I.R : ≤0.010mm at 3D (I.D 1.0 - 10.0mm)
◇ T.I.R : ≤0.015mm at 3D (I.D >10mm)



Unit : mm

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER 8HP	ER8-1.0HP	P2506292H	1.0 - 0.5	8.5	13.5
	ER8-1.5HP	P2506293H	1.5 - 1.0	8.5	13.5
	ER8-2.0HP	P2506294H	2.0 - 1.5	8.5	13.5
	ER8-2.5HP	P2506295H	2.5 - 2.0	8.5	13.5
	ER8-3.0HP	P2506296H	3.0 - 2.5	8.5	13.5
	ER8-3.5HP	P2506297H	3.5 - 3.0	8.5	13.5
	ER8-4.0HP	P2506298H	4.0 - 3.5	8.5	13.5
	ER8-4.5HP	P2506299H	4.5 - 4.0	8.5	13.5
	ER8-5.0HP	P2506300H	5.0 - 4.5	8.5	13.5
	ER8HP SET	P2506301H	9 pcs (Ø1.0 - Ø5.0)		

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER16HP	ER16-1.5HP	P2506201H	1.5 - 1.0	17.0	27.0
	ER16-2.0HP	P2506202H	2.0 - 1.5	17.0	27.0
	ER16-3.0HP	P2506203H	3.0 - 2.0	17.0	27.0
	ER16-4.0HP	P2506204H	4.0 - 3.0	17.0	27.0
	ER16-5.0HP	P2506205H	5.0 - 4.0	17.0	27.0
	ER16-6.0HP	P2506206H	6.0 - 5.0	17.0	27.0
	ER16-7.0HP	P2506207H	7.0 - 6.0	17.0	27.0
	ER16-8.0HP	P2506208H	8.0 - 7.0	17.0	27.0
	ER16-9.0HP	P2506209H	9.0 - 8.0	17.0	27.0
	ER16-10.0HP	P2506210H	10.0 - 9.0	17.0	27.0
	ER16HP SET	P2506303H	10 pcs (Ø1.0 - Ø10.0)		

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER25HP	ER25-2.0HP	P2506212H	2.0 - 1.5	26.0	34.0
	ER25-3.0HP	P2506213H	3.0 - 2.0	26.0	34.0
	ER25-4.0HP	P2506214H	4.0 - 3.0	26.0	34.0
	ER25-5.0HP	P2506215H	5.0 - 4.0	26.0	34.0
	ER25-6.0HP	P2506216H	6.0 - 5.0	26.0	34.0
	ER25-7.0HP	P2506217H	7.0 - 6.0	26.0	34.0
	ER25-8.0HP	P2506218H	8.0 - 7.0	26.0	34.0
	ER25-9.0HP	P2506219H	9.0 - 8.0	26.0	34.0
	ER25-10.0HP	P2506220H	10.0 - 9.0	26.0	34.0
	ER25-11.0HP	P2506221H	11.0 - 10.0	26.0	34.0
	ER25-12.0HP	P2506222H	12.0 - 11.0	26.0	34.0
	ER25-13.0HP	P2506223H	13.0 - 12.0	26.0	34.0
	ER25-14.0HP	P2506224H	14.0 - 13.0	26.0	34.0
	ER25-15.0HP	P2506225H	15.0 - 14.0	26.0	34.0
	ER25-16.0HP	P2506226H	16.0 - 15.0	26.0	34.0
	ER25HP SET	P2506305H	18 pcs (Ø1.0 - Ø13.0)		

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
ER32HP	ER32-3.0HP	P2506233H	3.0 - 2.0	33.0	40.0
	ER32-4.0HP	P2506234H	4.0 - 3.0	33.0	40.0
	ER32-5.0HP	P2506235H	5.0 - 4.0	33.0	40.0
	ER32-6.0HP	P2506236H	6.0 - 5.0	33.0	40.0
	ER32-7.0HP	P2506237H	7.0 - 6.0	33.0	40.0
	ER32-8.0HP	P2506238H	8.0 - 7.0	33.0	40.0
	ER32-9.0HP	P2506239H	9.0 - 8.0	33.0	40.0
	ER32-10.0HP	P2506240H	10.0 - 9.0	33.0	40.0
	ER32-11.0HP	P2506241H	11.0 - 10.0	33.0	40.0
	ER32-12.0HP	P2506242H	12.0 - 11.0	33.0	40.0
	ER32-13.0HP	P2506243H	13.0 - 12.0	33.0	40.0
	ER32-14.0HP	P2506244H	14.0 - 13.0	33.0	40.0
	ER32-15.0HP	P2506245H	15.0 - 14.0	33.0	40.0
	ER32-16.0HP	P2506246H	16.0 - 15.0	33.0	40.0
	ER32-17.0HP	P2506247H	17.0 - 16.0	33.0	40.0
	ER32-18.0HP	P2506248H	18.0 - 17.0	33.0	40.0
	ER32-19.0HP	P2506249H	19.0 - 18.0	33.0	40.0
	ER32-20.0HP	P2506250H	20.0 - 19.0	33.0	40.0
	ER32HP SET	P2506306H	20 pcs (Ø2.0 - Ø20.0)		

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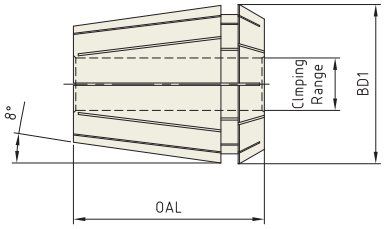
ER COLLET - GER (Ultra Precision)

GER

◇ T.I.R : ≤0.005mm at 3D



Unit : mm

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
GER25	GER25-1.0	P2772456	1.0 - 0.5	26.0	34.0
	GER25-2.0	P2772441	2.0 - 1.5	26.0	34.0
	GER25-2.5	P2772458	2.5 - 2.0	26.0	34.0
	GER25-3.0	P2772442	3.0 - 2.0	26.0	34.0
	GER25-4.0	P2772443	4.0 - 3.0	26.0	34.0
	GER25-5.0	P2772444	5.0 - 4.0	26.0	34.0
	GER25-6.0	P2772445	6.0 - 5.0	26.0	34.0
	GER25-7.0	P2772446	7.0 - 6.0	26.0	34.0
	GER25-8.0	P2772447	8.0 - 7.0	26.0	34.0
	GER25-9.0	P2772448	9.0 - 8.0	26.0	34.0
	GER25-10.0	P2772449	10.0 - 9.0	26.0	34.0
	GER25-11.0	P2772450	11.0 - 10.0	26.0	34.0
	GER25-12.0	P2772451	12.0 - 11.0	26.0	34.0
	GER25-13.0	P2772452	13.0 - 12.0	26.0	34.0
	GER25-14.0	P2772453	14.0 - 13.0	26.0	34.0
	GER25-15.0	P2772454	15.0 - 14.0	26.0	34.0
	GER25-16.0	P2772455	16.0 - 15.0	26.0	34.0

COLLET SIZE	MODEL No.	EDP No.	CLAMPING RANGE	BD1	OAL
GER32	GER32-3.0	P2772459	3.0 - 2.0	33.0	40.0
	GER32-4.0	P2772460	4.0 - 3.0	33.0	40.0
	GER32-5.0	P2772461	5.0 - 4.0	33.0	40.0
	GER32-6.0	P2772462	6.0 - 5.0	33.0	40.0
	GER32-7.0	P2772463	7.0 - 6.0	33.0	40.0
	GER32-8.0	P2772464	8.0 - 7.0	33.0	40.0
	GER32-9.0	P2772465	9.0 - 8.0	33.0	40.0
	GER32-10.0	P2772466	10.0 - 9.0	33.0	40.0
	GER32-11.0	P2772467	11.0 - 10.0	33.0	40.0
	GER32-12.0	P2772468	12.0 - 11.0	33.0	40.0
	GER32-13.0	P2772469	13.0 - 12.0	33.0	40.0
	GER32-14.0	P2772470	14.0 - 13.0	33.0	40.0
	GER32-15.0	P2772471	15.0 - 14.0	33.0	40.0
	GER32-16.0	P2772472	16.0 - 15.0	33.0	40.0
	GER32-17.0	P2772473	17.0 - 16.0	33.0	40.0
	GER32-18.0	P2772474	18.0 - 17.0	33.0	40.0
	GER32-19.0	P2772475	19.0 - 18.0	33.0	40.0
	GER32-20.0	P2772476	20.0 - 19.0	33.0	40.0

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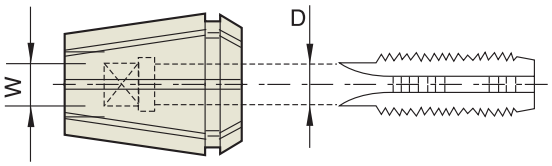
TAP ER COLLET (DIN)

RDTC



Unit : mm

TAPER No.	MODEL No.	EDP No.	DIN374/376	DIN352/2181	DIN371	D(Ø)	W(□)
RD32	RD32TC-3.5X2.7	P2772538D	M5	M3	M3	3.5	2.7
	RD32TC-4.0X3.0	P2772539D	M5.5	M3.5	M3.5	4.0	3.0
	RD32TC-4.5X3.4	P2772540D	M6	M4	M4	4.5	3.4
	RD32TC-5.0X4.0	P2772541D	M5	-	-	5.0	4.0
	RD32TC-5.5X4.3	P2772542D	M7	-	-	5.5	4.3
	RD32TC-6.0X4.9	P2772543D	M8	M4.5-M8	M4.5-M8	6.0	4.9
	RD32TC-7.0X5.5	P2772544D	M9+M10	M9+M10	M7	7.0	5.5
	RD32TC-8.0X6.2	P2772545D	M11	M11	M8	8.0	6.2
	RD32TC-9.0X7.0	P2772546D	M12	M12	M9	9.0	7.0
	RD32TC-10.0X8.0	P2772547D	-	-	M10	10.0	8.0
	RD32TC-11.0X9.0	P2772548D	M13+M14	M13+M14	-	11.0	9.0
	RD32TC-12.0X9.0	P2772549D	M15+M17	M15+M17	-	12.0	9.0
	RD32TC-14.0X11.0	P2772550D	M18+M19	M18+M19	-	14.0	11.0
	RD32TC-16.0X12.0	P2772551D	M20+M21	M20+M21	-	16.0	12.0
RD40	RD40TC-11.0X9.0	P2772562D	M13+M14	M13+M14	-	11.0	9.0
	RD40TC-12.0X9.0	P2772563D	M15+M17	M15+M17	-	12.0	9.0
	RD40TC-16.0X12.0	P2772565D	M20+M21	M20+M21	-	16.0	12.0
	RD40TC-18.0X14.5	P2772566D	M22-M26	M22-M26	-	18.0	14.5
	RD40TC-20.0X16.0	P2772567D	M27+M28	M27+M28	-	20.0	16.0

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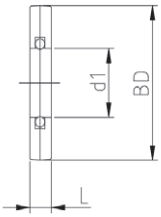
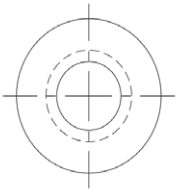
SEALING DISK





Unit : mm

MODEL No.	EDP No.	BD1	d1	L (Thickness)
DS/ER16-6.0	P2780506	13.0	6.0 - 5.5	4.0
DS/ER16-8.0	P2780509	13.0	8.0 - 7.5	4.0
DS/ER16-9.0	P2780510	13.0	9.0 - 8.5	4.0
DS/ER16-10.0	P2780511	13.0	10.0 - 9.5	4.0

MODEL No.	EDP No.	BD1	d1	L (Thickness)
DS/ER20-6.0	P2780517	16.0	5.0 - 4.5	4.0
DS20/ER-8.0	P2780521	16.0	8.0 - 7.5	4.0
DS/ER20-9.0	P2780523	16.0	9.0 - 8.5	4.0
DS/ER20-10.0	P2780524	16.0	10.0 - 9.5	4.0
DS/20ER-11.0	P2780525	16.0	11.0 - 10.5	4.0
DS/20ER-12.0	P2780526	16.0	12.0 - 11.5	4.0

MODEL No.	EDP No.	BD1	d1	L (Thickness)
DS/ER25-6.0	P2780534	21.0	5.0 - 4.5	4.0
DS/ER25-8.0	P2780538	21.0	8.0 - 7.5	4.0
DS/ER25-9.0	P2780540	21.0	9.0 - 8.5	4.0
DS/ER25-10.0	P2780542	21.0	10.0 - 9.5	4.0
DS/ER25-11.0	P2780544	21.0	11.0 - 10.5	4.0
DS/ER25-12.0	P2780546	21.0	12.0 - 11.5	4.0
DS/ER25-14.0	P2780550	21.0	14.0 - 13.5	4.0
DS/ER25-16.0	P2780554	21.0	16.0 - 15.5	4.0

MODEL No.	EDP No.	BD1	d1	L (Thickness)
DS/ER32-6.0	P2780558	27.0	5.0 - 4.5	4.0
DS/ER32-8.0	P2780560	27.0	8.0 - 7.5	4.0
DS/ER32-9.0	P2780561	27.0	9.0 - 8.5	4.0
DS/ER32-10.0	P2780562	27.0	10.0 - 9.5	4.0
DS/ER32-11.0	P2780564	27.0	11.0 - 10.5	4.0
DS/ER32-12.0	P2780566	27.0	12.0 - 11.5	4.0
DS/ER32-14.0	P2780570	27.0	14.0 - 13.5	4.0
DS/ER32-16.0	P2780573	27.0	16.0 - 15.5	4.0
DS/ER32-18.0	P2780575	27.0	18.0 - 17.5	4.0

MODEL No.	EDP No.	BD1	d1	L (Thickness)
DS/ER40-6.0	P2780581	33.5	5.0 - 4.5	4.0
DS/ER40-8.0	P2780583	33.5	8.0 - 7.5	4.0
DS/ER40-9.0	P2780584	33.5	9.0 - 8.5	4.0
DS/ER40-12.0	P2780587	33.5	12.0 - 11.5	4.0
DS/ER40-14.0	P2780589	33.5	14.0 - 13.5	4.0
DS/ER40-16.0	P2780591	33.5	16.0 - 15.5	4.0
DS/ER40-18.0	P2780593	33.5	18.0 - 17.5	4.0
DS/ER40-20.0	P2780595	33.5	20.0 - 19.5	4.0

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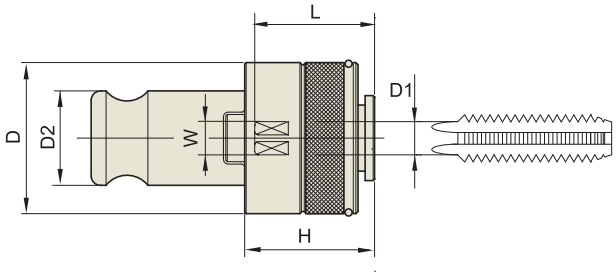
TAP ADAPTOR (DIN) - QUICK CHANGE TYPE (With safety clutch)



Unit : mm

TAPER No.	MODEL No.	EDP No.	D	D1(Ø)	D2	H	W(□)	L
TCS12D	TCS12 D-2821	P2774601	32	2.8	19	25	2.1	24
	TCS12 D-3527	P2774602	32	3.5	19	25	2.7	24
	TCS12 D-4534	P2774603	32	4.0	19	25	3.0	24
	TCS12 D-649	P2774606	32	6.0	19	25	4.9	25
	TCS12 D-862	P2774608	32	8.0	19	25	6.2	25
	TCS12 D-97	P2774609	32	9.0	19	25	7.0	26
	TCS12 D-108	P2774610	32	10.0	19	25	8.0	26
TCS24D	TCS24 D-649	P2774612	52	4.9	31	33	4.9	38
	TCS24 D-755	P2774613	52	5.5	31	33	5.5	38
	TCS24 D-862	P2774614	52	6.2	31	33	6.2	38
	TCS24 D-97	P2774615	52	7.0	31	33	7.0	38
	TCS24 D-108	P2774616	52	8.0	31	33	8.0	39
	TCS24 D-119	P2774617	52	9.0	31	33	9.0	41
	TCS24 D-129	P2774618	52	9.0	31	33	9.0	43
	TCS24 D-1411	P2774619	52	11.0	31	33	11.0	43
	TCS24 D-1612	P2774620	52	12.0	31	33	12.0	46
	TCS24 D-18145	P2774621	52	14.5	31	33	14.5	46
TCS38D	TCS38 D-1612	P2774625	72	16	48	45	12.0	45
	TCS38 D-18145	P2774626	72	18	48	45	14.5	62
	TCS38 D-2016	P2774627	72	20	48	45	16.0	64
	TCS38 D-2218	P2774628	72	22	48	45	18.0	66
	TCS38 D-2822	P2774630	72	28	48	45	22.0	68

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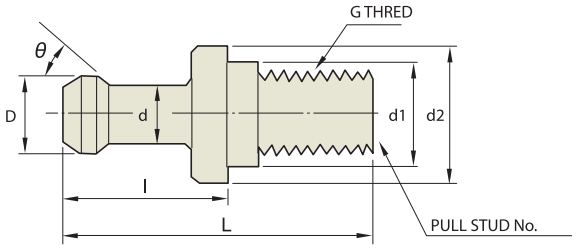
PULL STUD BOLT

PSB

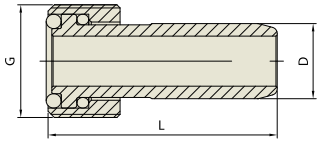


Unit : mm

MODEL No.	EDP No.	D	d2	d1	d	L	l	G	θ	Applications
PS-1	P2775051	15	23	17	10	60	35	M16	45°	BT40-Ⅰ Standard Type
PS-1H	P2506701	15	23	17	10	60	35	M16	45°	BT40-Ⅰ Standard Type (Through Hole)
PS-806	P2775102	19	23	17	14	54	29	M16	75°	BT40 (Through Hole)
PS-2	P2775052	15	23	17	10	60	35	M16	60°	BT40-Ⅱ Standard Type
PS-2H	P2506702	15	23	17	10	60	35	M16	60°	BT40-Ⅱ Standard Type (Through Hole)
PS-5	P2775053	23	38	25	17	85	45	M24	45°	BT50-Ⅰ Standard Type
PS-5H	P2506704	23	38	25	17	85	45	M24	45°	BT50-Ⅰ Standard Type (Through Hole)
PS-6	P2775054	23	38	25	17	85	45	M24	60°	BT50-Ⅱ Standard Type
PS-0	P2506706	23	38	25	17	85	45	M24	90°	For BT50 OKK
PS-G51	P2775060	18.8	22	17	12.45	44.1	19.1	M16	45°	For BT40 MAZAK
PSS-1	P2506707	19	23	17	14	54	26	M16	75°	For SK40
PSS-1H	P2775096	19	23	17	14	54	26	M16	75°	For SK40 (Through Hole)
PSS-5	P2506708	28	36	25	21	74	34	M24	75°	For SK50
PSS-5H	P2775086	28	36	25	21	74	34	M24	75°	For SK50 (Through Hole)

COOLANT TUBE (For HSK TAPER)

CT



Unit : mm

TAPER No.	EDP No.	D	L	G
HSK63A	P2775081	12	36.5	M18
HSK100A	P2775082	16	44	M24

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