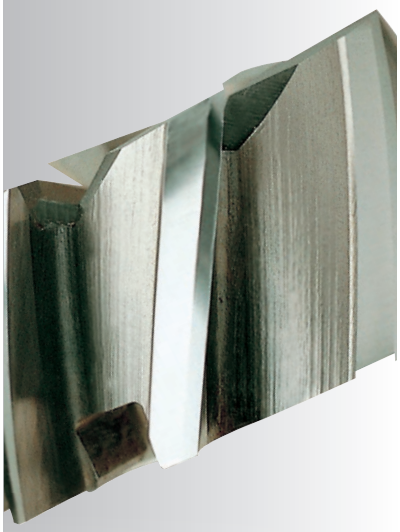
YG

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			

ML072 ML172	ML092	ML102	E2675	E2676	E2677	E2678	E2679	E2498
T-SLOT CUTTERS	SIDE AND FACE MILLING CUTTERS	SIDE AND FACE MILLING CUTTERS	SHELL END MILL	SHELL END MILL	ROUGHING SHELL END MILL	ROUGHING SHELL END MILL	ROUGHING & FINISHING SHELL END MILL	CORNER ROUNDING CUTTERS
Multi Flute	Multi Flute	Multi Flute	Multi Flute	Multi Flute	Multi Flute	Multi Flute	Multi Flute	4
10°~20°	-	-	30°	42°	30°	30°	30°	0°
D12.5	D50.0	D50.0	D30.0	D40.0	D40.0	D40.0	D50.0	D8.0
D40.0	D125.0	D200.0	D100.0	D100.0	D160.0	D100.0	D75.0	D56.0
C756	C757	C758	C761	C762	C763	C764	C765	C766
Type AA, AB, AD	with STRAIGHT TEETH	with STAGGERED TEETH	-	for ALUMINUM	-	-	-	-
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
HSS-E	HSS-E	HSS-E	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8
◎	◎	◎	◎	○	◎	◎	◎	◎
◎	◎	◎	◎	○	◎	◎	◎	◎
◎	◎	◎	◎	○	◎	◎	◎	◎
◎	◎	◎	◎	○	◎	◎	◎	◎
◎	◎	◎	◎		○	○	○	○
◎	◎	◎	◎	○	◎	◎	◎	◎
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◎	◎	◎	◎		○	○	○	○
	○	○	○		○	○	○	○
◎	◎	◎	◎	○	◎	◎	◎	◎
	○	○	○		○	○	○	○
○	○	○		◎	○	○	○	○
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○	○	○		◎	○	○	○	○
○	○	○		◎	○	○	○	○
○	○	○		◎	○	○	○	○

CARBIDE
HSS
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

MILLING CUTTERS

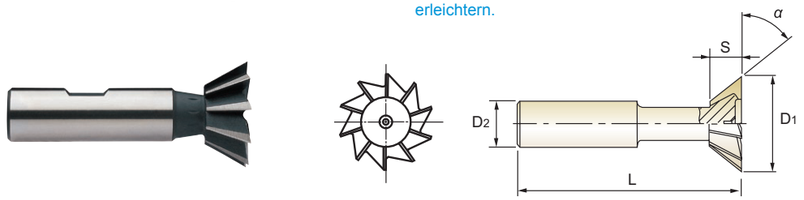
PLAIN SHANK **ML012, ML022** SERIES
FLAT SHANK **ML112, ML122** SERIES

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.



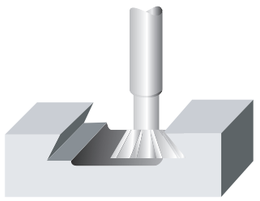
HSS-E | DIN 1833 | N | 0° | DIN 1835A | DIN 1835B | UNCOATED p.C768

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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

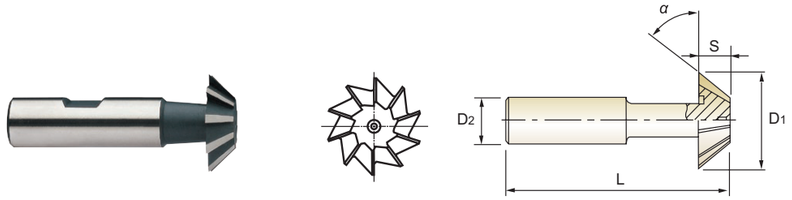
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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 **ML032, ML042** SERIES
FLAT SHANK **ML132, ML142** SERIES

HSS-E, DOVETAIL CUTTERS TYPE “B”, “D”, “F”

- HSS-E, WINKELFRÄSER FORM “B”, “D”, “F”
- FRAISE HSS-E POUR QUEUE D'ARRONDE TYPE "B", "D", "F"
- FRESE AD ANGOLO CONVERGENTE TIPO “B”, “D”, “F”



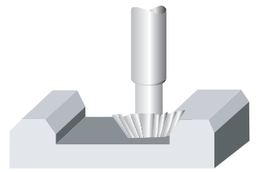
HSS-E | DIN 1833 | N | 0° | DIN 1835A | DIN 1835B | UNCOATED p.C769

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
ML03201601	ML13201601	16.0	4	45°	12	60	6
-	ML13202001	20.0	5	45°	12	63	6
-	ML13202201	22.0	6	45°	12	67	6
ML03202501	ML13202501	25.0	6.3	45°	16	67	8
-	ML13202801	28.0	7.5	45°	16	67	8
-	ML13203201	32.0	8	45°	16	71	10
ML03203801	ML13203801	38.0	10	45°	16	80	12
ML04201601	ML14201601	16.0	6.3	60°	12	60	6
-	ML14202001	20.0	8	60°	12	63	6
-	ML14202201	22.0	9	60°	12	67	6
-	ML14202501	25.0	10	60°	16	67	8
-	ML14202801	28.0	11	60°	16	67	8
-	ML14203201	32.0	12.5	60°	16	71	10
-	ML14203801	38.0	16	60°	16	80	12

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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

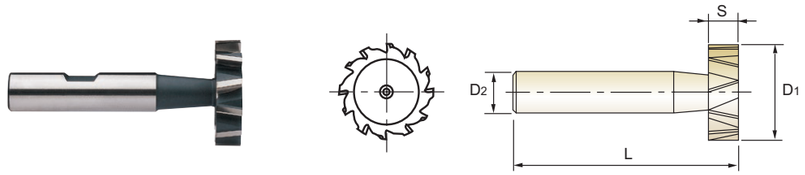
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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

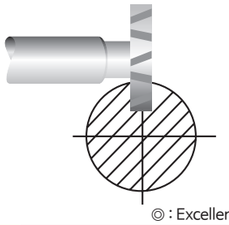
Unit : mm

EDP No.		Cutter Diameter	Width of Face	Shank Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	D1(h11)	S(e8)	D2(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 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	over 50 to 80
Tolerance range in mm							
js18	± 0.90	± 1.10	± 1.35	± 1.65	± 1.95	± 2.30	± 2.70
Tolerance range in μm							
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																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

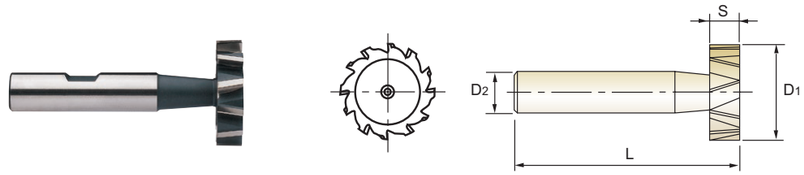
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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”



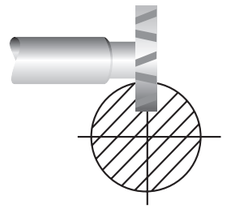
HSS-E | DIN 850 | N | 10°~12° | DIN 1835A | DIN 1835B | UNCOATED p.C770

Unit : mm

EDP No.		Cutter Diameter	Width of Face	Shank Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	D1(h11)	S(e8)	D2(h6)	L(js18)	Z
ML06225E02	ML16225E02	25.5	6	10	63	10
ML06225E03	ML16225E03	25.5	7	10	63	10
ML06225E04	ML16225E04	25.5	8	10	63	10
ML06228E01	ML16228E01	28.5	5	10	63	10
ML06228E02	ML16228E02	28.5	6	10	63	10
-	ML16228E03	28.5	7	10	63	10
ML06228E04	ML16228E04	28.5	8	10	63	10
ML06228E05	ML16228E05	28.5	10	12	71	10
ML06232E01	ML16232E01	32.5	5	12	71	12
ML06232E02	ML16232E02	32.5	6	12	71	12
-	ML16232E03	32.5	7	12	71	12
ML06232E04	ML16232E04	32.5	8	12	71	12
-	ML16232E05	32.5	10	12	71	12
ML06238E01	ML16238E01	38.5	7	12	71	12
ML06238E02	ML16238E02	38.5	8	12	71	12
-	ML16238E03	38.5	9	12	71	12
ML06238E04	-	38.5	10	12	71	12
ML06245E01	ML16245E01	45.5	10	12	71	14

Tolerances according to DIN 7160 & 7161

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	over 50 to 80
Tolerance range in mm							
js18	± 0.90	± 1.10	± 1.35	± 1.65	± 1.95	± 2.30	± 2.70
Tolerance range in μm							
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																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

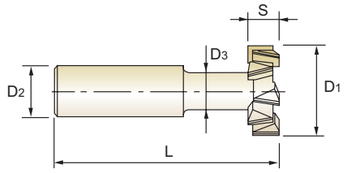
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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 **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



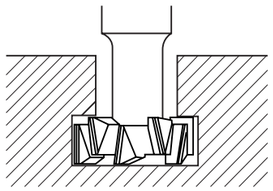
HSS-E | DIN 851 | N | 10°~20° | DIN 1835A | DIN 1835B | UNCOATED p.C771

Unit : mm

EDP No.		Cutter Diameter	Width of Face	Shank Diameter	Neck Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	D1(d11)	S(d11)	D2(h6)	D3(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	○	○	○	○	○																

MILLING CUTTERS

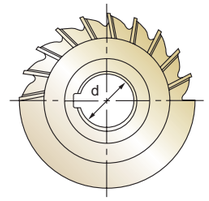
STRAIGHT TEETH **ML092** SERIES

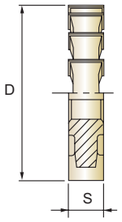
HSS-E, SIDE AND FACE MILLING CUTTERS with STRAIGHT TEETH

- HSS-E, SCHEIBENFRÄSER MIT GERADEVERZAHNT
- FRAISE HSS-E 3 TAILLES, DENTURE DROITE
- FRESE A DISCO A TRE TAGLI - DENTI DRITTI

▶ The tools are used for general purpose side and straddle milling where deep cut is not required.

▶ Diese Werkzeuge werden bei allgemeinen Seiten-und Breitfräsen eingesetzt, wo Tiefschnitte nicht vorkommen.





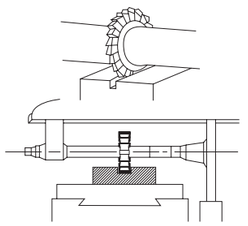
HSS-E | DIN 885-B | H | UNCOATED p.C772

Unit : mm

EDP No.	Cutter Diameter	Width of Face	Internal Diameter	No. of Teeth
	D1(js14)	S(k11)	d(H7)	Z
ML09205001	50.0	4	16	18
ML09205003	50.0	6	16	18
ML09205004	50.0	8	16	16
ML09205005	50.0	10	16	16
ML09206301	63.0	5	22	22
ML09206303	63.0	8	22	20
ML09206305	63.0	12	22	20
ML09208001	80.0	6	22	24
ML09208003	80.0	10	22	24
ML09208005	80.0	6	27	24
ML09210001	100.0	6	27	26
ML09210002	100.0	8	27	26
ML09210003	100.0	10	27	22
ML09210005	100.0	8	32	26
ML09212501	125.0	8	32	30
ML09212502	125.0	10	32	30
ML09212503	125.0	12	32	24

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
Tolerance range in mm								
js14	± 0.15	± 0.18	± 0.215	± 0.26	± 0.31	± 0.37	± 0.435	± 0.50
Tolerance range in μm								
k11	+ 75 / 0	+ 90 / 0	+ 110 / 0	+ 130 / 0	+ 160 / 0	+ 190 / 0	+ 220 / 0	+ 250 / 0
H7	+ 12 / 0	+ 15 / 0	+ 18 / 0	+ 21 / 0	+ 25 / 0	+ 30 / 0	+ 35 / 0	+ 40 / 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

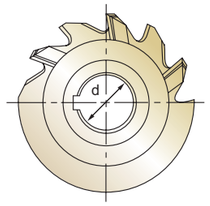
STAGGERED TEETH **ML102** SERIES

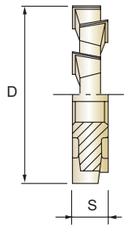
HSS-E, SIDE AND FACE MILLING CUTTERS with STAGGERED TEETH

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

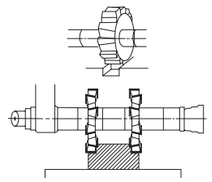
Unit : mm

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

▶ NEXT PAGE

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	○	○	○	○	○																

MILLING CUTTERS

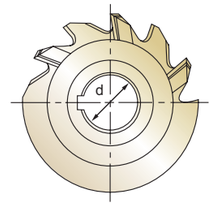
STAGGERED TEETH ML102 SERIES

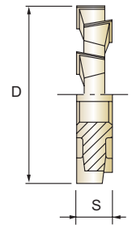
HSS-E, SIDE AND FACE MILLING CUTTERS with STAGGERED TEETH

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

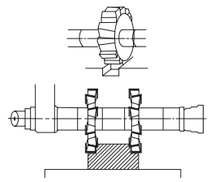
Unit : mm

EDP No.	Cutter Diameter	Width of Face	Internal Diameter	No. of Teeth
	D(js14)	S(k11)	d(H7)	Z
ML10208008	80.0	10	22	18
ML10208009	80.0	12	22	18
ML10208013	80.0	20	22	18
ML10208014	80.0	4	27	18
ML10208015	80.0	5	27	18
ML10208016	80.0	6	27	18
ML10208018	80.0	8	27	18
ML10208020	80.0	10	27	18
ML10208021	80.0	12	27	18
ML10210001	100.0	3	27	20
ML10210002	100.0	4	27	20
ML10210003	100.0	5	27	20
ML10210004	100.0	6	27	20
ML10210005	100.0	7	27	20
ML10210006	100.0	8	27	20
ML10210007	100.0	9	27	20
ML10210008	100.0	10	27	20
ML10210009	100.0	12	27	20
ML10210010	100.0	14	27	20
ML10210012	100.0	16	27	20
ML10210014	100.0	20	27	20
ML10210015	100.0	4	32	20

Tolerances according to DIN 7160 & 7161

▶ NEXT PAGE

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	○	○	○	○	○																

MILLING CUTTERS

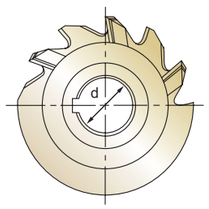
STAGGERED TEETH **ML102** SERIES

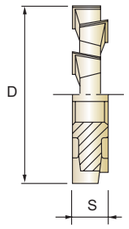
HSS-E, SIDE AND FACE MILLING CUTTERS with STAGGERED TEETH

- 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.





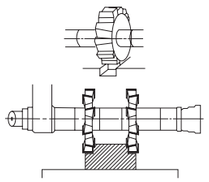
HSS-E | DIN 885-A | H | UNCOATED p.C773

Unit : mm

EDP No.	Cutter Diameter	Width of Face	Internal Diameter	No. of Teeth
	D(js14)	S(k11)	d(H7)	Z
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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

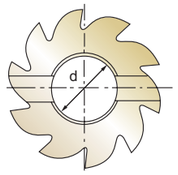
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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	○	○	○	○	○																

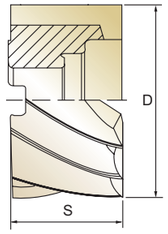
MILLING CUTTERS

E2675 SERIES

HSS Co8, MULTI FLUTE SHELL END MILL

- HSS Co8, MULTI SCHNEIDEN WALZENSTIRNFRÄSER
- FRAISE HSS Co8, MULTI-DENTS TROU LISSE
- FRESA CILINDRICA FRONTALE, MULTI TAGLIENTE





HSS Co8 | DIN 841 | N | 6-10 | 30° | UNCOATED p.C774

Unit : mm

EDP No.	Mill Diameter	Width of Face	Internal Diameter	No. of Teeth
	D	S	d	Z
E2675300	30.0	30	● 13	6
E2675350	35.0	35	● 16	6
E2675400	40.0	20	● 16	8
E2675402	40.0	40	● 16	8
E2675500	50.0	25	22	8
E2675502	50.0	50	22	8
E2675751	75.0	75	27	10

● Tolerance of Internal Diameter = +0.018 ~ 0
▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

HSS Co8 | DIN 1880 | N | 8-14 | 30° p.C774

Unit : mm

EDP No.	Mill Diameter	Width of Face	Internal Diameter	No. of Teeth
	D	S	d	Z
E2675401	40.0	32	● 16	8
E2675501	50.0	36	22	8
E2675630	63.0	40	27	8
E2675800	80.0	45	27	10
E2675901	100.0	50	32	10

● 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	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○									

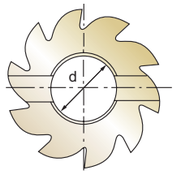
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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																				○	

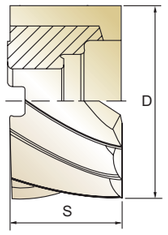
MILLING CUTTERS

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 D	Width of Face S	Internal Diameter d	No. of Teeth 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 D	Width of Face S	Internal Diameter d	No. of Teeth 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	○	○	○	○		○	○			○										

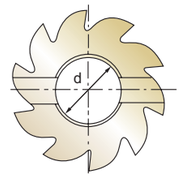
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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	◎	◎	◎	◎	◎																

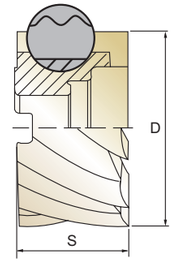
MILLING CUTTERS

E2677 SERIES

HSS Co8, MULTI FLUTE ROUGHING SHELL END MILL - COARSE

- HSS Co8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPFRÄSER - GROBES
- FRAISE HSS Co8, MULTI-DENTS TROU LISSE, ÉBAUCHE, PAS GROSSIER
- FRESA CILINDRICA FRONTALE MULTI TAGLIENTE, PER SGROSSATURA





HSS Co8 | DIN 841 | NR | 6-12 | 30° | UNCOATED p.C775

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth Z
E2677401	40.0	40	● 16	6
E2677501	50.0	50	22	8
E2677900	90.0	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 | NR | 6-12 | 30° | UNCOATED p.C775

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth Z
E2677400	40.0	32	● 16	6
E2677500	50.0	36	22	8
E2677630	63.0	40	27	8
E2677904	160.0	63	50	12

● 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	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

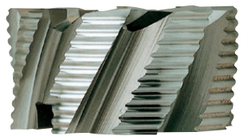
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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	○	○	○	○	○																

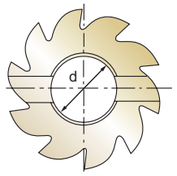
MILLING CUTTERS

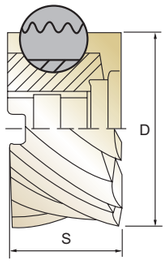
E2678 SERIES

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	Width of Face	Internal Diameter	No. of Teeth
	D	S	d	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	Width of Face	Internal Diameter	No. of Teeth
	D	S	d	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	◎	◎	◎	◎	○	◎	◎	○	○	◎	○																		

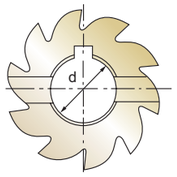
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	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	○	○	○	○	○																

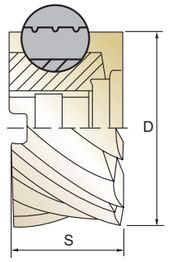
MILLING CUTTERS

E2679 SERIES

HSS Co8, MULTI FLUTE ROUGHING & FINISHING SHELL END MILL

HSS Co8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPSCHLICHTFRÄSER
FRAISE HSS Co8, MULTI-DENTS TROU LISSE, ÉBAUCHE ET FINITION
FRESA CILINDRICA FRONTALE MULTI TAGLIENTE, SEMI FINITURA





HSS Co8 | DIN 841 | NF | 6-12 | 30° | UNCOATED p.C775

Unit : mm

EDP No.	Mill Diameter	Width of Face	Internal Diameter	No. of Teeth
	D	S	d	Z
E2679600	**60.0**	30	27	8
E2679601	**60.0**	60	27	8
E2679750	**75.0**	35	27	10

▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

HSS Co8 | DIN 1880 | NF | 6-12 | 30° | UNCOATED p.C775

Unit : mm

EDP No.	Mill Diameter	Width of Face	Internal Diameter	No. of Teeth
	D	S	d	Z
E2679500	**50.0**	36	22	8
E2679630	**63.0**	40	27	8

▶ 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

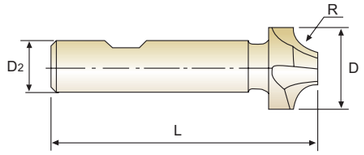
FLAT SHANK **E2498** SERIES

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	○	○	○	○	○																

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

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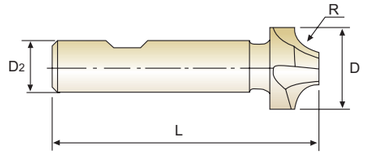


HSS Co8 | DIN 6518 | N | 4 | 0° | DIN 1835B | UNCOATED p.C776

Unit : mm

EDP No.	Radius	Outside Diameter	Shank Diameter	Overall Length
	R(H11)	D	D2(h6)	L
E2498105	R10.5	**31.0**	25	90
E2498110	R11.0	**32.0**	25	90
E2498120	R12.0	**34.0**	25	90
E2498125	R12.5	**41.0**	25	100
E2498130	R13.0	**42.0**	25	100
E2498140	R14.0	**44.0**	25	100
E2498150	R15.0	**46.0**	25	100
E2498160	R16.0	**48.0**	25	100
E2498180	R18.0	**52.0**	32	112
E2498200	R20.0	**56.0**	32	112

▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

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	○	○	○	○	○																

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

ML032, ML132, ML042, ML142 SERIES

MULTI FLUTE DOVETAIL 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) 16.0	20.0	25.0	32.0
P	1	Non-alloy steel	Vc	30	30	30	30
			fz	0.03	0.037	0.026	0.042
			RPM	597	477	382	298
			FEED	107	106	79	125
	2		Vc	15	15	15	15
			fz	0.031	0.036	0.031	0.041
			RPM	298	239	191	149
			FEED	56	52	47	61
	3-4		Vc	10	10	10	10
			fz	0.031	0.035	0.028	0.04
			RPM	199	159	127	99
			FEED	37	33	29	40
	5		Vc	10	10	10	10
			fz	0.021	0.02	0.02	0.02
			RPM	199	159	127	99
			FEED	25	19	20	20
	6	Low alloy steel	Vc	15	15	15	15
			fz	0.031	0.036	0.031	0.041
			RPM	298	239	191	149
			FEED	56	52	47	61
	7		Vc	10	10	10	10
			fz	0.031	0.035	0.028	0.04
			RPM	199	159	127	99
			FEED	37	33	29	40
	8-9		Vc	10	10	10	10
			fz	0.021	0.02	0.02	0.02
			RPM	199	159	127	99
			FEED	25	19	20	20
	10	High alloyed steel, and tool steel	Vc	15	15	15	15
			fz	0.031	0.036	0.031	0.041
			RPM	298	239	191	149
			FEED	56	52	47	61
	11.1		Vc	10	10	10	10
			fz	0.021	0.02	0.02	0.02
			RPM	199	159	127	99
			FEED	25	19	20	20
N	21~25	Aluminum-wrought alloy, Aluminum-cast, alloyed	Vc	95	85	90	90
			fz	0.03	0.04	0.029	0.041
			RPM	1890	1353	1146	895
			FEED	340	325	266	367

CARBIDE
HSS
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

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

ML072, ML172 SERIES

MULTI FLUTE T-SLOT CUTTERS TYPE 'AA', 'AB', 'AD'

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

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 12.5	16.0	18.0	19.0	21.0	22.0	25.0	28.0	32.0	50.0	63.0
P	1	Non-alloy steel	Vc	30	30	30	30	30	30	30	30	30	40	50
			fz	0.008	0.013	0.014	0.017	0.018	0.021	0.028	0.036	0.036	0.037	0.036
			RPM	764	597	531	503	455	434	382	341	298	255	253
			FEED	37	47	45	51	49	55	64	74	86	75	73
	2		Vc	15	15	15	15	15	15	15	15	15	20	25
			fz	0.007	0.011	0.012	0.013	0.016	0.019	0.026	0.037	0.035	0.037	0.04
			RPM	382	298	265	251	227	217	191	171	149	127	126
			FEED	16	20	19	20	22	25	30	38	42	38	40
	3-4		Vc	10	10	10	10	10	10	10	10	10	15	15
			fz	0.005	0.007	0.01	0.014	0.017	0.019	0.022	0.028	0.025	0.028	0.029
			RPM	255	199	177	168	152	145	127	114	99	95	76
			FEED	8	8	11	14	15	16	17	19	20	21	18
	6	Low alloy steel	Vc	15	15	15	15	15	15	15	15	15	20	25
			fz	0.007	0.011	0.012	0.013	0.016	0.019	0.026	0.037	0.035	0.037	0.04
			RPM	382	298	265	251	227	217	191	171	149	127	126
			FEED	16	20	19	20	22	25	30	38	42	38	40
	7		Vc	10	10	10	10	10	10	10	10	10	15	15
			fz	0.005	0.007	0.01	0.014	0.017	0.019	0.022	0.028	0.025	0.028	0.029
			RPM	255	199	177	168	152	145	127	114	99	95	76
			FEED	8	8	11	14	15	16	17	19	20	21	18
	10	High alloyed steel, and tool steel	Vc	15	15	15	15	15	15	15	15	15	20	25
			fz	0.007	0.011	0.012	0.013	0.016	0.019	0.026	0.037	0.035	0.037	0.04
			RPM	382	298	265	251	227	217	191	171	149	127	126
			FEED	16	20	19	20	22	25	30	38	42	38	40
N	21~25	Aluminum-wrought alloy, Aluminum-cast, alloyed	Vc	90	90	95	90	95	90	90	90	90	125	145
			fz	0.008	0.013	0.015	0.017	0.019	0.021	0.026	0.034	0.034	0.036	0.036
			RPM	2292	1790	1680	1508	1440	1302	1146	1023	895	796	733
			FEED	110	140	151	154	164	164	179	209	244	229	211

MILLING CUTTERS

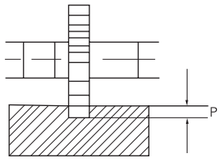
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

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

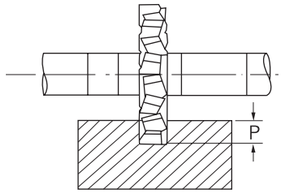
RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

ML102 SERIES

MULTI FLUTE SIDE AND FACE MILLING CUTTERS WITH STAGGERED 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	160.0	200.0
P	1	Non-alloy steel	Vc	25	25	25	25	25	25	25
			fz	0.058	0.08	0.081	0.081	0.072	0.081	0.079
			RPM	159	126	99	80	64	50	40
			FEED	129	162	145	129	101	105	94
	2		Vc	20	20	20	20	20	20	20
			fz	0.053	0.052	0.055	0.05	0.055	0.05	0.048
			RPM	127	101	80	64	51	40	32
			FEED	94	84	79	64	62	52	46
	3-4		Vc	15	15	15	15	15	15	15
			fz	0.044	0.043	0.044	0.044	0.045	0.044	0.041
			RPM	95	76	60	48	38	30	24
			FEED	59	52	47	42	38	34	29
	5		Vc	10	10	10	10	10	10	10
			fz	0.039	0.04	0.04	0.039	0.039	0.04	0.039
			RPM	64	51	40	32	25	20	16
			FEED	35	32	29	25	22	21	19
	6	Low alloy steel	Vc	20	20	20	20	20	20	20
			fz	0.053	0.052	0.055	0.05	0.055	0.05	0.048
			RPM	127	101	80	64	51	40	32
			FEED	94	84	79	64	62	52	46
	7		Vc	15	15	15	15	15	15	15
			fz	0.044	0.043	0.044	0.044	0.045	0.044	0.041
			RPM	95	76	60	48	38	30	24
			FEED	59	52	47	42	38	34	29
	8-9		Vc	10	10	10	10	10	10	10
			fz	0.039	0.04	0.04	0.039	0.039	0.04	0.039
			RPM	64	51	40	32	25	20	16
			FEED	35	32	29	25	22	21	19
	10	High alloyed steel, and tool steel	Vc	20	20	20	20	20	20	20
			fz	0.053	0.052	0.055	0.05	0.055	0.05	0.048
			RPM	127	101	80	64	51	40	32
			FEED	94	84	79	64	62	52	46
	11.1		Vc	10	10	10	10	10	10	10
			fz	0.039	0.04	0.04	0.039	0.039	0.04	0.039
			RPM	64	51	40	32	25	20	16
			FEED	35	32	29	25	22	21	19
N	21~25	Aluminum-wrought alloy, Aluminum-cast, alloyed	Vc	100	100	100	100	100	100	100
			fz	0.023	0.031	0.035	0.031	0.036	0.029	0.031
			RPM	637	505	398	318	255	199	159
			FEED	205	251	251	197	202	150	148



MILLING DEPTH P = WIDTH OF FACES

CARBIDE
HSS
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

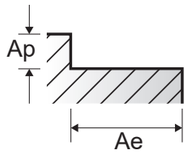
MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2675 SERIES — MULTI FLUTE SHELL END MILL

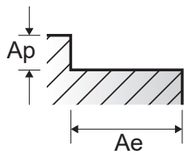
Vc = m/min.
fz = mm/tooth
RPM = rev./min.
FEED = mm/min.

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



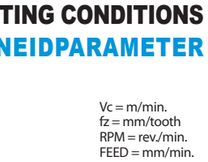
MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDPARAMETER

E2677, E2678 SERIES — MULTI FLUTE ROUGHING 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	0.069	0.078	0.092	0.1	0.115	0.12	0.153
					RPM	239	191	152	119	95	76	60
					FEED	99	119	112	119	110	110	110
	3-4		0.75D	0.25D	Vc	25	25	25	25	25	25	30
					fz	0.071	0.077	0.091	0.1	0.119	0.113	0.139
					RPM	199	159	126	99	80	64	60
					FEED	85	98	92	99	95	86	100
	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	0.135
					RPM	159	127	101	80	64	51	40
					FEED	68	79	73	75	74	66	64
	6	Low alloy steel	0.75D	0.25D	Vc	30	30	30	30	30	30	30
					fz	0.069	0.078	0.092	0.1	0.115	0.12	0.153
					RPM	239	191	152	119	95	76	60
					FEED	99	119	112	119	110	110	110
	7		0.75D	0.25D	Vc	25	25	25	25	25	25	30
					fz	0.071	0.077	0.091	0.1	0.119	0.113	0.139
					RPM	199	159	126	99	80	64	60
					FEED	85	98	92	99	95	86	100
	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	0.135
					RPM	159	127	101	80	64	51	40
					FEED	68	79	73	75	74	66	64
	9		0.75D	0.25D	Vc	10	10	10	10	10	10	10
					fz	0.073	0.08	0.1	0.1	0.117	0.146	0.146
					RPM	80	64	51	40	32	25	20
					FEED	35	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	0.069	0.078	0.092	0.1	0.115	0.12	0.153
					RPM	239	191	152	119	95	76	60
					FEED	99	119	112	119	110	110	110
	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	0.135
					RPM	159	127	101	80	64	51	40
					FEED	68	79	73	75	74	66	64



E2679 SERIES — MULTI FLUTE ROUGHING & FINISHING SHELL END MILL

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	0.069	0.078	0.092	0.1	0.115	0.12	0.153
					RPM	239	191	152	119	95	76	60
					FEED	99	119	112	119	110	110	110
	3-4		0.75D	0.25D	Vc	25	25	25	25	25	25	30
					fz	0.071	0.077	0.091	0.1	0.119	0.113	0.139
					RPM	199	159	126	99	80	64	60
					FEED	85	98	92	99	95	86	100
	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	0.135
					RPM	159	127	101	80	64	51	40
					FEED	68	79	73	75	74	66	64
	6	Low alloy steel	0.75D	0.25D	Vc	30	30	30	30	30	30	30
					fz	0.069	0.078	0.092	0.1	0.115	0.12	0.153
					RPM	239	191	152	119	95	76	60
					FEED	99	119	112	119	110	110	110
	7		0.75D	0.25D	Vc	25	25	25	25	25	25	30
					fz	0.071	0.077	0.091	0.1	0.119	0.113	0.139
					RPM	199	159	126	99	80	64	60
					FEED	85	98	92	99	95	86	100
	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	0.135
					RPM	159	127	101	80	64	51	40
					FEED	68	79	73	75	74	66	64
	9		0.75D	0.25D	Vc	10	10	10	10	10	10	10
					fz	0.073	0.08	0.1	0.1	0.117	0.146	0.146
					RPM	80	64	51	40	32	25	20
					FEED	35	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	0.069	0.078	0.092	0.1	0.115	0.12	0.153
					RPM	239	191	152	119	95	76	60
					FEED	99	119	112	119	110	110	110
	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	0.135
					RPM	159	127	101	80	64	51	40
					FEED	68	79	73	75	74	66	64

CARBIDE
HSS
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

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