HSS

YG

Being the best through innovation

MILLING CUTTER

FRÄSER

- General Works. Available Dovetail, Woodruff Keyseat, T-slot, Side Milling Cutters and HSS (8% cobalt) Corner Rounding,Shell End Mills
- Für allgemeinen Einsatz. Winkelschaftfräser, Schlitzfräser, T-Nutenfräser, Konkavfräser, Scheibenfräser und HSSE-Co8 Walzenstirnfräser

SELECTION GUIDE

ITEM	MODEL	DESCRIPTION	SIZE		PAGE
			MIN	MAX	
ML012, ML022 ML112, ML122 ML212, ML222		HSS-E, DOVETAIL CUTTERS TYPE “A”, “C”, “E” HSS-E, WINKELFRÄSER FORM “A”, “C”, “E”	D16.0	D50.0	1272
ML032, ML042 ML132, ML142 ML232, ML242		HSS-E, DOVETAIL CUTTERS TYPE “B”, “D”, “F” HSS-E, WINKELFRÄSER FORM “B”, “D”, “F”	D16.0	D38.0	1273
ML062 ML162 ML262		HSS-E, WOODRUFF KEYSEAT CUTTERS TYPE “B”, “D”, “F” HSS-E, SCHLITZFRÄSER FORM “B”, “D”, “F”	D10.5	D45.5	1274
ML072 ML172 ML272		HSS-E, T-SLOT CUTTERS TYPE “AA”, “AB”, “AD” HSS-E, SCHAFTERFRÄSER FÜR T-NUTEN FORM “AA”, “AB”, “AD”	D12.5	D40.0	1276
ML092		HSS-E, SIDE AND FACE MILLING CUTTERS with STRAIGHT TEETH HSS-E, SCHEIBENFRÄSER mit GERADEVERZAHNT	D50.0	D125.0	1277
ML102		HSS-E, SIDE AND FACE MILLING CUTTERS with STAGGERED TEETH HSS-E, SCHEIBENFRÄSER mit KREUZVERZAHNT	D50.0	D200.0	1278
E2675		HSSCo8, MULTI FLUTE SHELL END MILL HSSCo8, MULTI SCHNEIDEN WALZENSTIRNFRÄSER	D30.0	D160.0	1282
E2676		HSSCo8, MULTI FLUTE SHELL END MILL for ALUMINUM HSSCo8, MULTI SCHNEIDEN WALZENSTIRNFRÄSER für ALUMINIUM	D30.0	D100.0	1283
E2677		HSSCo8, MULTI FLUTE ROUGHING SHELL END MILL - COARSE HSSCo8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPFRÄSER - GROBES	D40.0	D160.0	1284
E2678		HSSCo8, MULTI FLUTE ROUGHING SHELL END MILL - FINE HSSCo8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPFRÄSER - FEINES	D40.0	D160.0	1285
E2679		HSSCo8, MULTI FLUTE ROUGHING & FINISHING SHELL END MILL HSSCo8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPSCHLICHTFRÄSER	D40.0	D160.0	1286
E2498		HSSCo8, 4 FLUTE CORNER ROUNDING CUTTERS HSSCo8, 4 SCHNEIDEN VIERTELKREISFRÄSER	D8.0	D56.0	1287
		RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDKONDITIONEN			1288

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					
◎	◎	○							○					
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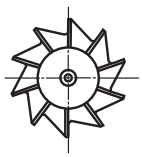
YG MILLING CUTTERS

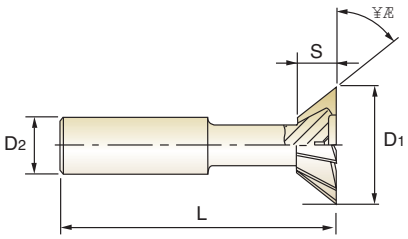
ML012, ML022 SERIES PLAIN SHANK / GLATTER ZYLINDERSCHAFT
ML112, ML122 SERIES FLAT SHANK / SEITLICHEN MITNAHMEFLÄCHEN
ML212, ML222 SERIES THREAD SHANK / ANZUGSGEWINDE

HSS-E, DOVETAIL CUTTERS TYPE "A", "C", "E"
HSS-E, WINKELFRÄSER FORM "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 | DIN 1835D

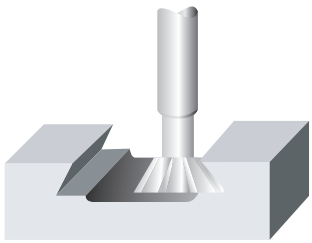
P.1288

Unit : mm

EDP No. PLAIN	EDP No. FLAT	EDP No. THREAD	Cutter Diameter D1(js16)	Width of Face S(js14)	Divergent Taper Angle α(±15′)	Shank Diameter D2(h6)	Overall Length L(js18)	No. of Teeth Z
ML01201601	ML11201601	ML21201601	16.0	4	45°	12	60	6
ML01202001	ML11202001	ML21202001	20.0	5	45°	12	63	6
ML01202201	ML11202201	ML21202201	22.0	6	45°	12	67	6
ML01202501	ML11202501	ML21202501	25.0	6.3	45°	16	67	8
ML01202801	ML11202801	ML21202801	28.0	7.5	45°	16	67	8
ML01203201	ML11203201	ML21203201	32.0	8	45°	16	71	10
ML01203801	ML11203801	ML21203801	38.0	10	45°	16	80	12
ML02201601	ML12201601	ML22201601	16.0	6.3	60°	12	60	6
ML02202001	ML12202001	ML22202001	20.0	8	60°	12	63	6
ML02202201	ML12202201	ML22202201	22.0	9	60°	12	67	6
ML02202501	ML12202501	ML22202501	25.0	10	60°	16	67	8
ML02202801	ML12202801	ML22202801	28.0	11	60°	16	67	8
ML02203201	ML12203201	ML22203201	32.0	12.5	60°	16	71	10
ML02203801	ML12203801	ML22203801	38.0	16	60°	16	80	12
ML02204001	ML12204001	ML22204001	40.0	13	60°	25	85	12
ML02205001	ML12205001	ML22205001	50.0	16	60°	25	100	16

Tolerances according to DIN 7160 & 7161
Toleranzen nach DIN 7160 & 7161

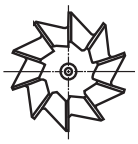
Nominal-Diameter in mm / Nennmaßbereich in mm	over 3 to 6 über 3 bis 6	over 6 to 10 über 6 bis 10	over 10 to 18 über 10 bis 18	over 18 to 30 über 18 bis 30	over 30 to 50 über 30 bis 50	over 50 to 80 über 50 bis 80	over 80 to 120 über 80 bis 120
Tolerance range in mm / Toleranzwerte in mm							
js16	± 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 / Toleranzwerte in μm							
h6	0 / − 8	0 / − 9	0 / − 11	0 / − 13	0 / − 16	0 / − 19	0 / − 22

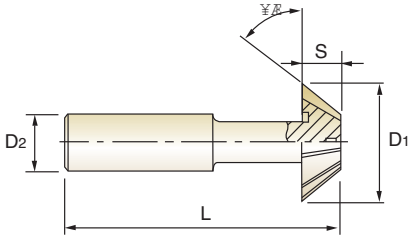


◎ : Excellent ○ : Good

Carbon Steels ~HB225	Alloy Steels HB225~325	Prehardened Steels HRc30~40	Hardened Steels HRc40~45	Hardened Steels HRc45~55	High Hardened Steels HRc55~70	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
◎	◎	○							○					

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





HSS-E | DIN 1833 | N | 0° | DIN 1835A | DIN 1835B | DIN 1835D

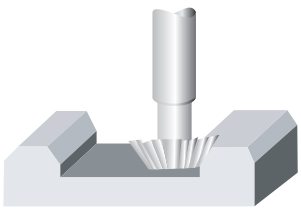
P.1288

Unit : mm

EDP No.			Cutter Diameter	Width of Face	Convergent Taper Angle	Shank Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	THREAD	D1(js16)	S(js14)	α(±15′)	D2(h6)	L(js18)	Z
ML03201601	ML13201601	ML23201601	16.0	4	45°	12	60	6
ML03202001	ML13202001	ML23202001	20.0	5	45°	12	63	6
ML03202201	ML13202201	ML23202201	22.0	6	45°	12	67	6
ML03202501	ML13202501	ML23202501	25.0	6.3	45°	16	67	8
ML03202801	ML13202801	ML23202801	28.0	7.5	45°	16	67	8
ML03203201	ML13203201	ML23203201	32.0	8	45°	16	71	10
ML03203801	ML13203801	ML23203801	38.0	10	45°	16	80	12
ML04201601	ML14201601	ML24201601	16.0	6.3	60°	12	60	6
ML04202001	ML14202001	ML24202001	20.0	8	60°	12	63	6
ML04202201	ML14202201	ML24202201	22.0	9	60°	12	67	6
ML04202501	ML14202501	ML24202501	25.0	10	60°	16	67	8
ML04202801	ML14202801	ML24202801	28.0	11	60°	16	67	8
ML04203201	ML14203201	ML24203201	32.0	12.5	60°	16	71	10
ML04203801	ML14203801	ML24203801	38.0	16	60°	16	80	12

Tolerances according to DIN 7160 & 7161
Toleranzen nach DIN 7160 & 7161

Nominal-Diameter in mm / Nennmaßbereich in mm						
	over 3 to 6 über 3 bis 6	over 6 to 10 über 6 bis 10	over 10 to 18 über 10 bis 18	over 18 to 30 über 18 bis 30	over 30 to 50 über 30 bis 50	over 50 to 80 über 50 bis 80
Tolerance range in mm / Toleranzwerte in mm						
js16	± 0.375	± 0.45	± 0.55	± 0.65	± 0.80	± 0.95
js14	± 0.15	± 0.18	± 0.215	± 0.26	± 0.31	± 0.37
js18	± 0.90	± 1.10	± 1.35	± 1.65	± 1.95	± 2.30
Tolerance range in μm / Toleranzwerte in μm						
h6	0 / − 8	0 / − 9	0 / − 11	0 / − 13	0 / − 16	0 / − 19



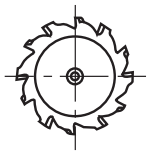
◎ : Excellent ○ : Good

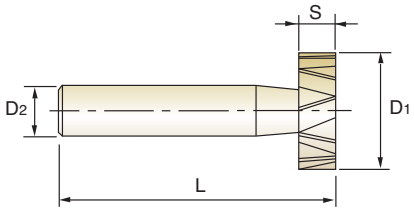
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

YG MILLING CUTTERS

ML062 SERIES PLAIN SHANK GLATTER ZYLINDERSCHAFT
ML162 SERIES FLAT SHANK SEITLICHEN MITNAHMEFLÄCHEN
ML262 SERIES THREAD SHANK ANZUGSGEWINDE

HSS-E, WOODRUFF KEYSEAT CUTTERS TYPE "B", "D", "F"
HSS-E, SCHLITZFRÄSER FORM "B", "D", "F"





HSS-E | DIN 850 | N | 10~12° | DIN 1835A | DIN 1835B | DIN 1835D P.1289

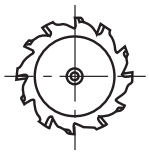
Unit : mm

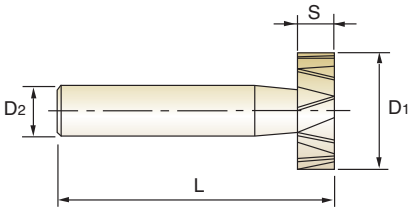
EDP No. PLAIN	EDP No. FLAT	EDP No. THREAD	Cutter Diameter D1(h11)	Width of Face S(e8)	Shank Diameter D2(h6)	Overall Length L(js18)	No. of Teeth Z
ML06210E01	ML16210E01	ML26210E01	10.5	2	6	50	8
ML06210E02	ML16210E02	ML26210E02	10.5	2.5	6	50	8
ML06210E03	ML16210E03	ML26210E03	10.5	3	6	50	8
ML06213E01	ML16213E01	ML26213E01	13.5	2	10	56	8
ML06213E02	ML16213E02	ML26213E02	13.5	2.5	10	56	8
ML06213E03	ML16213E03	ML26213E03	13.5	3	10	56	8
ML06213E04	ML16213E04	ML26213E04	13.5	4	10	56	8
ML06216E01	ML16216E01	ML26216E01	16.5	2.5	10	56	8
ML06216E02	ML16216E02	ML26216E02	16.5	3	10	56	8
ML06216E03	ML16216E03	ML26216E03	16.5	4	10	56	8
ML06216E04	ML16216E04	ML26216E04	16.5	5	10	56	8
ML06219E01	ML16219E01	ML26219E01	19.5	3	10	56	8
ML06219E02	ML16219E02	ML26219E02	19.5	4	10	63	8
ML06219E03	ML16219E03	ML26219E03	19.5	5	10	63	8
ML06219E04	ML16219E04	ML26219E04	19.5	6	10	63	8
ML06222E01	ML16222E01	ML26222E01	22.5	4	10	63	10
ML06222E02	ML16222E02	ML26222E02	22.5	5	10	63	10
ML06222E03	ML16222E03	ML26222E03	22.5	6	10	63	10
ML06222E04	ML16222E04	ML26222E04	22.5	8	10	63	10
ML06225E01	ML16225E01	ML26225E01	25.5	5	10	63	10
ML06225E02	ML16225E02	ML26225E02	25.5	6	10	63	10
ML06225E03	ML16225E03	ML26225E03	25.5	7	10	63	10
ML06225E04	ML16225E04	ML26225E04	25.5	8	10	63	10
ML06228E01	ML16228E01	ML26228E01	28.5	5	10	63	10
ML06228E02	ML16228E02	ML26228E02	28.5	6	10	63	10
ML06228E03	ML16228E03	ML26228E03	28.5	7	10	63	10
ML06228E04	ML16228E04	ML26228E04	28.5	8	10	63	10
ML06228E05	ML16228E05	ML26228E05	28.5	10	12	71	10

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

HSS-E, WOODRUFF KEYSEAT CUTTERS TYPE “B”, “D”, “F”
HSS-E, SCHLITZFRÄSER FORM “B”, “D”, “F”





HSS-E | DIN 850 | N | 10~12° | DIN 1835A | DIN 1835B | DIN 1835D

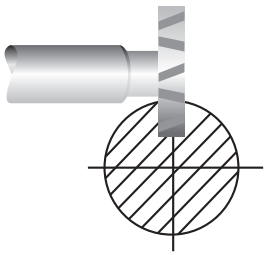
P.1289

Unit : mm

EDP No.			Cutter Diameter	Width of Face	Shank Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	THREAD	D1(h11)	S(e8)	D2(h6)	L(js18)	Z
ML06232E01	ML16232E01	ML26232E01	32.5	5	12	71	12
ML06232E02	ML16232E02	ML26232E02	32.5	6	12	71	12
ML06232E03	ML16232E03	ML26232E03	32.5	7	12	71	12
ML06232E04	ML16232E04	ML26232E04	32.5	8	12	71	12
ML06232E05	ML16232E05	ML26232E05	32.5	10	12	71	12
ML06238E01	ML16238E01	ML26238E01	38.5	7	12	71	12
ML06238E02	ML16238E02	ML26238E02	38.5	8	12	71	12
ML06238E03	ML16238E03	ML26238E03	38.5	9	12	71	12
ML06238E04	ML16238E04	ML26238E04	38.5	10	12	71	12
ML06245E01	ML16245E01	ML26245E01	45.5	10	12	71	14

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	over 18 to 30 über 18 bis 30	over 30 to 50 über 30 bis 50	over 50 to 80 über 50 bis 80
Tolerance range in mm / Toleranzwerte in mm							
js18	—	± 0.90	± 1.10	± 1.35	± 1.65	± 1.95	± 2.30
Tolerance range in μm / Toleranzwerte 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



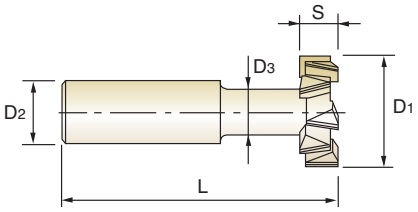
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

YG MILLING CUTTERS

ML072 SERIES PLAIN SHANK GLATTER ZYLINDERSCHAFT
ML172 SERIES FLAT SHANK SEITLICHEN MITNAHMEFLÄCHEN
ML272 SERIES THREAD SHANK ANZUGSGEWINDE

HSS-E, T-SLOT CUTTERS TYPE "AA", "AB", "AD"
HSS-E, SCHAFTERFRÄSER FÜR T-NUTEN FORM "AA", "AB", "AD"



HSS-E | DIN 851 | N | 10° | DIN 1835A | DIN 1835B | DIN 1835D

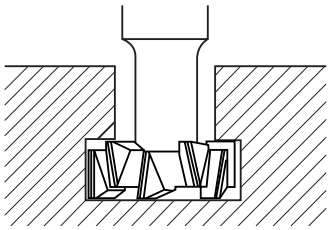
P.1289

Unit : mm

EDP No.			Cutter Diameter	Width of Face	Shank Diameter	Neck Diameter	Overall Length	No. of Teeth
PLAIN	FLAT	THREAD	D1(d11)	S(d11)	D2(h6)	D3(h12)	L(js18)	Z
ML07212E01	ML17212E01	ML27212E01	12.5	6	10	5	57	6
ML07201601	ML17201601	ML27201601	16.0	8	10	6.5	62	6
ML07201801	ML17201801	ML27201801	18.0	8	12	8	70	6
ML07201901	ML17201901	ML27201901	19.0	9	12	8	71	6
ML07202101	ML17202101	ML27202101	21.0	9	12	10	74	6
ML07202201	ML17202201	ML27202201	22.0	10	12	10	75	6
ML07202501	ML17202501	ML27202501	25.0	11	16	12	82	6
ML07202801	ML17202801	ML27202801	28.0	12	16	13	83	6
ML07203201	ML17203201	ML27203201	32.0	14	16	15	90	8
ML07203601	ML17203601	ML27203601	36.0	16	25	17	103	8
ML07204001	ML17204001	ML27204001	40.0	18	25	19	108	8

Tolerances according to DIN 7160 & 7161
Toleranzen nach DIN 7160 & 7161

Nominal-Diameter in mm / Nennmaßbereich in mm	over 3 to 6 über 3 bis 6	over 6 to 10 über 6 bis 10	over 10 to 18 über 10 bis 18	over 18 to 30 über 18 bis 30	over 30 to 50 über 30 bis 50	over 50 to 80 über 50 bis 80	over 80 to 120 über 80 bis 120
Tolerance range in mm / Toleranzwerte 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 / Toleranzwerte 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



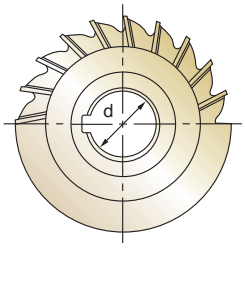
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎								○					

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

▶ 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

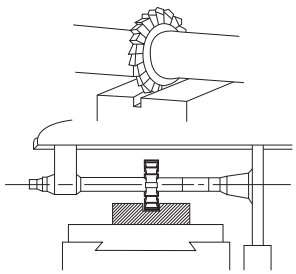
P.1290

Unit : mm

EDP No.	Cutter Diameter D(js14)	Width of Face S(k11)	Internal Diameter d(H7)	No. of Teeth Z
ML09205001	50.0	4	16	18
ML09205002	50.0	5	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
ML09206302	63.0	6	22	22
ML09206303	63.0	8	22	20
ML09206304	63.0	10	22	20
ML09206305	63.0	12	22	20
ML09208001	80.0	6	22	24
ML09208002	80.0	8	22	24
ML09208003	80.0	10	22	24
ML09208004	80.0	12	22	20
ML09208005	80.0	6	27	24
ML09208006	80.0	8	27	24
ML09208007	80.0	10	27	24
ML09208008	80.0	12	27	20
ML09210001	100.0	6	27	26
ML09210002	100.0	8	27	26
ML09210003	100.0	10	27	22
ML09210004	100.0	6	32	26
ML09210005	100.0	8	32	26
ML09210006	100.0	10	32	22
ML09210007	100.0	12	32	22
ML09212501	125.0	8	32	30
ML09212502	125.0	10	32	30
ML09212503	125.0	12	32	24

Tolerances according to DIN 7160 & 7161
Toleranzen nach DIN 7160 & 7161

	Nominal-Diameter in mm / Nennmaßbereich in mm							
	over 3 to 6 über 3 bis 6	over 6 to 10 über 6 bis 10	over 10 to 18 über 10 bis 18	over 18 to 30 über 18 bis 30	over 30 to 50 über 30 bis 50	over 50 to 80 über 50 bis 80	over 80 to 120 über 80 bis 120	over 120 to 180 über 120 bis 180
	Tolerance range in mm / Toleranzwerte mm							
js14	± 0.15	± 0.18	± 0.215	± 0.26	± 0.31	± 0.37	± 0.435	± 0.50
	Tolerance range in µm / Toleranzwerte 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

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

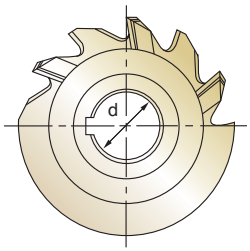
MILLING CUTTERS

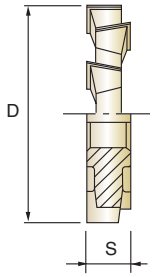
ML102 SERIES STAGGERED TEETH KREUZVERZAHNT

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

▶ 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

P.1291

Unit : mm

EDP No.	Cutter Diameter D(js14)	Width of Face S(k11)	Internal Diameter d(H7)	No. of Teeth 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
ML10205007	50.0	9	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
ML10206305	63.0	7	22	16
ML10206306	63.0	8	22	16
ML10206307	63.0	9	22	16
ML10206308	63.0	10	22	16
ML10206309	63.0	12	22	16
ML10206310	63.0	14	22	16
ML10206311	63.0	16	22	16
ML10206312	63.0	18	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
ML10208007	80.0	9	22	18
ML10208008	80.0	10	22	18

◎ : Excellent ○ : Good

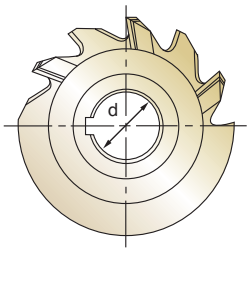
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

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

HSS-E, SCHEIBENFRÄSER mit KREUZVERZAHNT

▶ 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

P.1291

Unit : mm

EDP No.	Cutter Diameter D(js14)	Width of Face S(k11)	Internal Diameter d(H7)	No. of Teeth Z
ML10208009	80.0	12	22	18
ML10208010	80.0	14	22	18
ML10208011	80.0	16	22	18
ML10208012	80.0	18	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
ML10208017	80.0	7	27	18
ML10208018	80.0	8	27	18
ML10208019	80.0	9	27	18
ML10208020	80.0	10	27	18
ML10208021	80.0	12	27	18
ML10208022	80.0	14	27	18
ML10208023	80.0	16	27	18
ML10208024	80.0	18	27	18
ML10208025	80.0	20	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
ML10210011	100.0	15	27	20

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

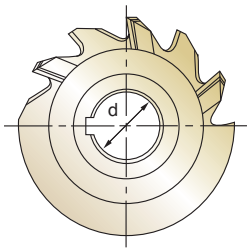
MILLING CUTTERS

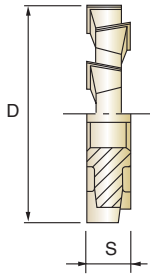
ML102 SERIES STAGGERED TEETH KREUZVERZAHNT

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

▶ 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

P.1291

Unit : mm

EDP No.	Cutter Diameter D(js14)	Width of Face S(k11)	Internal Diameter d(H7)	No. of Teeth Z
ML10210012	100.0	16	27	20
ML10210013	100.0	18	27	20
ML10210014	100.0	20	27	20
ML10210015	100.0	4	32	20
ML10210016	100.0	5	32	20
ML10210017	100.0	6	32	20
ML10210018	100.0	7	32	20
ML10210019	100.0	8	32	20
ML10210020	100.0	9	32	20
ML10210021	100.0	10	32	20
ML10210022	100.0	12	32	20
ML10210023	100.0	14	32	20
ML10210024	100.0	15	32	20
ML10210025	100.0	16	32	20
ML10210026	100.0	18	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
ML10212506	125.0	14	32	22
ML10212507	125.0	16	32	22
ML10212508	125.0	18	32	22
ML10212509	125.0	20	32	22
ML10216001	160.0	6	32	26
ML10216002	160.0	8	32	26
ML10216003	160.0	10	32	26

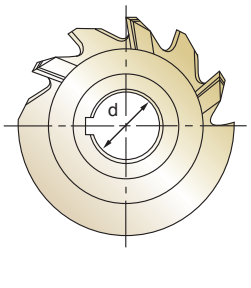
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

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

▶ 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

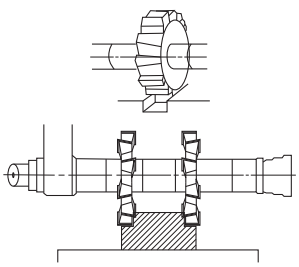
P.1291

Unit : mm

EDP No.	Cutter Diameter D(js14)	Width of Face S(k11)	Internal Diameter d(H7)	No. of Teeth Z
ML10216004	160.0	12	32	26
ML10216005	160.0	14	32	26
ML10216006	160.0	16	32	26
ML10216007	160.0	18	32	26
ML10216008	160.0	20	32	26
ML10216009	160.0	6	40	26
ML10216010	160.0	8	40	26
ML10216011	160.0	10	40	26
ML10216012	160.0	12	40	26
ML10216013	160.0	14	40	26
ML10216014	160.0	16	40	26
ML10216015	160.0	18	40	26
ML10216016	160.0	20	40	26
ML10220001	200.0	10	40	30
ML10220002	200.0	12	40	30
ML10220003	200.0	14	40	30
ML10220004	200.0	16	40	30
ML10220005	200.0	18	40	30
ML10220006	200.0	20	40	30
ML10220007	200.0	22	40	30
ML10220008	200.0	25	40	30

Tolerances according to DIN 7160 & 7161
Toleranzen nach DIN 7160 & 7161

	Nominal-Diameter in mm / Nennmaßbereich in mm								
	over 3 to 6 über 3 bis 6	over 6 to 10 über 6 bis 10	over 10 to 18 über 10 bis 18	over 18 to 30 über 18 bis 30	over 30 to 50 über 30 bis 50	over 50 to 80 über 50 bis 80	over 80 to 120 über 80 bis 120	over 120 to 180 über 120 bis 180	over 180 to 250 über 180 bis 250
	Tolerance range in mm / Toleranzwerte 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 / Toleranzwerte 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



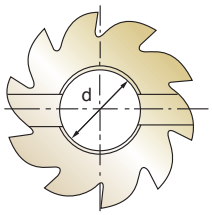
◎ : Excellent ○ : Good

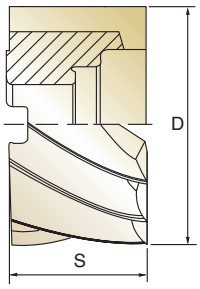
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

MILLING CUTTERS

E2675 SERIES

HSSCo8, MULTI FLUTE SHELL END MILL
HSSCo8, MULTI SCHNEIDEN WALZENSTIRNFRÄSER





HSS Co8 | DIN 841 | N | 6-10 | 30° P.1292

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth 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
E2675600	60.0	30	27	8
E2675601	60.0	60	27	8
E2675750	75.0	35	27	10
E2675751	75.0	75	27	10
E2675900	90.0	35	27	10
E2675902	110.0	35	32	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.1292

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth 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
E2675903	125.0	56	40	12
E2675904	160.0	63	50	14

Mill Dia. Tolerance(mm)	Width of Face Tolerance(mm)	Internal Dia. Tolerance(mm)
+ 0.25 − 0.15	+ 0.5 − 0	+ 0.02 − 0

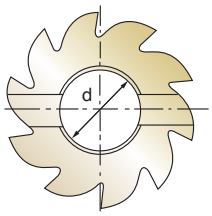
● Tolerance of Internal Diameter = +0.018 ~ 0
▶ TiN-COATING, TiCN-COATING & TiAlN-COATING is available on your request.

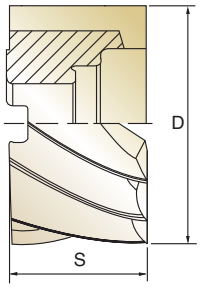
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○												

HSSCo8, MULTI FLUTE SHELL END MILL for ALUMINUM

HSSCo8, MULTI SCHNEIDEN WALZENSTIRNFRÄSER für ALUMINIUM





HSS Co8 | DIN 841 | W | 4&6 | 42° P.1292

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth Z
E2676300	30.0	30	● 13	4
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° P.1292

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

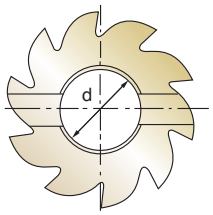
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
○	○								◎					

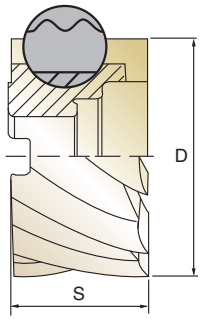
MILLING CUTTERS

E2677 SERIES

HSSCo8, MULTI FLUTE ROUGHING SHELL END MILL - COARSE

HSSCo8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPFRÄSER - GROBES





HSS Co8 | DIN 841 | NR | COARSE | 6-12 | 30° P.1293

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
E2677600	60.0	30	27	8
E2677601	60.0	60	27	8
E2677750	75.0	35	27	10
E2677751	75.0	75	27	10
E2677900	90.0	35	27	10
E2677902	110.0	35	32	12

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

HSS Co8 | DIN 1880 | NR | COARSE | 6-12 | 30° P.1293

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
E2677800	80.0	45	27	10
E2677901	100.0	50	32	10
E2677903	125.0	56	40	12
E2677904	160.0	63	50	12

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

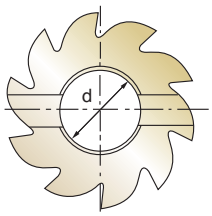
Mill Dia. Tolerance(mm)	Width of Face Tolerance(mm)	Internal Dia. Tolerance(mm)
+ 0.25 − 0.15	+ 0.5 − 0	+ 0.02 − 0

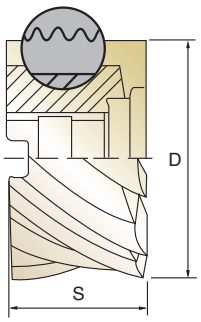
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

HSSCo8, MULTI FLUTE ROUGHING SHELL END MILL - FINE

HSSCo8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPFRÄSER - FEINES





HSS Co8 | DIN 841 | HR | FINE | 6-12 | 30° P.1293

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
E2678601	60.0	60	27	8
E2678750	75.0	35	27	10
E2678751	75.0	75	27	10
E2678900	90.0	35	27	10
E2678902	110.0	35	32	12

● Tolerance of Internal Diameter = +0.018 ~ 0

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

HSS Co8 | DIN 1880 | HR | FINE | 6-12 | 30° P.1293

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth Z
E2678400	40.0	32	● 16	6
E2678500	50.0	36	22	8
E2678630	63.0	40	27	8
E2678800	80.0	45	27	10
E2678901	100.0	50	32	10
E2678903	125.0	56	40	12
E2678904	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

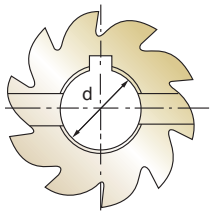
◎ : Excellent ○ : Good

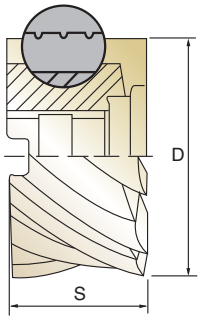
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

MILLING CUTTERS

E2679 SERIES

HSSCo8, MULTI FLUTE ROUGHING & FINISHING SHELL END MILL
HSSCo8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPSCHLICHTFRÄSER





HSS Co8 | DIN 841 | NF | ROUGHING & FINISHING | 6-12 | 30° P.1293

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth Z
E2679401	40.0	40	● 16	6
E2679501	50.0	50	22	8
E2679600	60.0	30	27	8
E2679601	60.0	60	27	8
E2679750	75.0	35	27	10
E2679751	75.0	75	27	10
E2679900	90.0	35	27	10
E2679902	110.0	35	32	12

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

HSS Co8 | DIN 1880 | NF | ROUGHING & FINISHING | 6-12 | 30° P.1293

Unit : mm

EDP No.	Mill Diameter D	Width of Face S	Internal Diameter d	No. of Teeth Z
E2679400	40.0	32	● 16	6
E2679500	50.0	36	22	8
E2679630	63.0	40	27	8
E2679800	80.0	45	27	10
E2679901	100.0	50	32	10
E2679903	125.0	56	40	12
E2679904	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

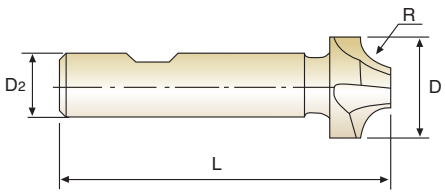
◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

HSSCo8, 4 FLUTE CORNER ROUNDING CUTTERS
HSSCo8, 4 SCHNEIDEN VIERTELKREISFRÄSER

▶ 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

P.1294

Unit : mm

EDP No.	Radius	Outside Diameter	Shank Diameter	Overall Length
FLAT	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
E2498095	R9.5	**27.0**	25	85
E2498100	R10.0	**28.0**	25	85
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

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	over 18 to 30 über 18 bis 30	over 30 to 50 über 30 bis 50
Tolerance range in μm / Toleranzwerte in μm						
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

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

◎ : Excellent ○ : Good

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels		High Hardened Steels	Copper	Graphite	Cast Iron	Aluminum	Stainless Steels	Titanium	Inconel	Acrylic	CFRP
~HB225	HB225~325	HRc30~40	HRc40~45	HRc45~55	HRc55~70									
◎	◎	○							○					

MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

HSS-E, DOVETAIL CUTTERS TYPE "A", "C", "E"
HSS-E, WINKELFRÄSER FORM "A", "C", "E"

ML012, ML112, ML022, ML122, ML212, ML222 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
STRENGTH	~ 500N/mm²				500 ~ 800N/mm²				800 ~ 1000N/mm²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
16.0	615	110	30	0.030	305	57	15	0.031	215	40	10	0.031
20.0	500	110	30	0.037	255	55	15	0.036	180	38	10	0.035
25.0	380	80	30	0.026	190	47	15	0.031	135	30	10	0.028
32.0	300	125	30	0.042	155	64	15	0.041	100	40	10	0.040
40.0	250	130	30	0.043	125	64	15	0.043	90	45	10	0.042
50.0	190	90	30	0.030	100	42	15	0.026	75	36	10	0.030
63.0	150	75	30	0.031	80	40	15	0.031	60	32	10	0.033

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALUMINUM & ALUMINUM ALLOYS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
16.0	160	20	10	0.021	1850	336	95	0.030
20.0	125	15	10	0.020	1350	324	85	0.040
25.0	100	16	10	0.020	1150	270	90	0.029
32.0	80	16	10	0.020	920	375	90	0.041
40.0	60	16	10	0.022	765	387	95	0.042
50.0	50	16	10	0.020	550	265	85	0.030
63.0	40	15	10	0.023	450	240	90	0.033

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

HSS-E, DOVETAIL CUTTERS TYPE "B", "D", "F"
HSS-E, WINKELFRÄSER FORM "B", "D", "F"

ML032, ML132, ML042, ML142, ML232, ML242 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
STRENGTH	~ 500N/mm²				500 ~ 800N/mm²				800 ~ 1000N/mm²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
16.0	615	110	30	0.030	305	57	15	0.031	215	40	10	0.031
20.0	500	110	30	0.037	255	55	15	0.036	180	38	10	0.035
25.0	380	80	30	0.026	190	47	15	0.031	135	30	10	0.028
32.0	300	125	30	0.042	155	64	15	0.041	100	40	10	0.040

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALUMINUM & ALUMINUM ALLOYS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
16.0	160	20	10	0.021	1850	336	95	0.030
20.0	125	15	10	0.020	1350	324	85	0.040
25.0	100	16	10	0.020	1150	270	90	0.029
32.0	80	16	10	0.020	920	375	90	0.041

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

HSS-E, WOODRUFF KEYSEAT CUTTERS TYPE "B", "D", "F"
HSS-E, SCHLITZFRÄSER FORM "B", "D", "F"

ML062, ML162, ML262 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
STRENGTH	~ 500N/mm²				500 ~ 800N/mm²				800 ~ 1000N/mm²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
10.5	900	72	30	0.010	600	48	20	0.010	480	38	15	0.010
13.5	700	56	30	0.010	470	38	20	0.010	370	30	15	0.010
16.5	570	114	30	0.025	380	76	20	0.025	300	60	15	0.025
19.5	480	134	30	0.035	320	90	20	0.035	260	73	15	0.035
22.5	420	168	30	0.040	280	112	20	0.040	220	88	15	0.040
28.5	330	165	30	0.050	220	110	20	0.050	180	90	15	0.050
32.5	290	209	30	0.060	190	137	20	0.060	155	112	15	0.060
45.5	210	206	30	0.070	130	127	20	0.070	110	108	15	0.070

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALUMINUM & ALUMINUM ALLOYS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
10.5	300	24	10	0.010	3000	240	100	0.010
13.5	230	18	10	0.010	2300	184	100	0.010
16.5	190	38	10	0.025	1900	380	100	0.025
19.5	160	45	10	0.035	1600	448	100	0.035
22.5	140	56	10	0.040	1400	560	100	0.040
28.5	110	55	10	0.050	1100	550	100	0.050
32.5	90	65	10	0.060	900	648	90	0.060
45.5	70	69	10	0.070	700	686	100	0.070

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

HSS-E, T-SLOT CUTTERS TYPE "AA", "AB", "AD"
HSS-E, SCHAFTERFRÄSER FÜR T-NUTEN FORM "AA", "AB", "AD"

ML072, ML172, ML272 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				ALUMINUM & ALUMINUM ALLOYS			
HARDNESS					~ HRc20				HRc20 ~ HRc30							
STRENGTH	~ 500N/mm²				500 ~ 800N/mm²				800 ~ 1000N/mm²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
12.5	770	38	30	0.008	380	16	15	0.007	270	8	10	0.005	2350	110	90	0.008
16.0	600	45	30	0.013	300	19	15	0.011	210	9	10	0.007	1830	140	90	0.013
18.0	550	47	30	0.014	270	20	15	0.012	195	12	10	0.010	1680	150	95	0.015
19.0	500	50	30	0.017	250	20	15	0.013	180	15	10	0.014	1540	160	90	0.017
21.0	470	52	30	0.018	230	22	15	0.016	160	16	10	0.017	1430	165	95	0.019
22.0	440	55	30	0.021	220	25	15	0.019	150	17	10	0.019	1330	170	90	0.021
25.0	390	65	30	0.028	190	30	15	0.026	135	18	10	0.022	1170	180	90	0.026
28.0	345	75	30	0.036	170	38	15	0.037	120	20	10	0.028	1040	210	90	0.034
32.0	310	90	30	0.036	150	42	15	0.035	100	20	10	0.025	910	250	90	0.034
50.0	270	80	40	0.037	135	40	20	0.037	90	20	15	0.028	800	230	125	0.036
63.0	240	70	50	0.036	120	38	25	0.040	85	20	15	0.029	730	210	145	0.036

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

MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

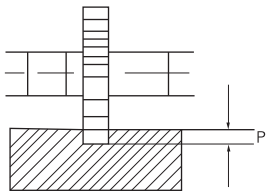
HSS-E, SIDE AND FACE MILLING CUTTERS WITH STRAIGHT TEETH
HSS-E, SCHEIBENFRÄSER mit GERADEVERZAHNT

ML092 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
STRENGTH	~ 500N/mm²				500 ~ 800N/mm²				800 ~ 1000N/mm²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
50.0	160	130	25	0.045	115	82	20	0.040	95	58	15	0.034
63.0	125	160	25	0.058	90	72	20	0.036	75	51	15	0.031
80.0	100	145	25	0.060	70	69	20	0.041	60	48	15	0.033
100.0	80	130	25	0.063	60	60	20	0.038	47	41	15	0.034
125.0	63	100	25	0.066	45	54	20	0.050	38	38	15	0.042

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALUMINUM & ALUMINUM ALLOYS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
50.0	76	42	10	0.031	630	200	100	0.018
63.0	60	38	10	0.029	500	250	100	0.023
80.0	47	34	10	0.030	400	250	100	0.026
100.0	38	30	10	0.030	320	200	100	0.024
125.0	30	26	10	0.036	250	200	100	0.033

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



MILLING DEPTH P = WIDTH OF FACES

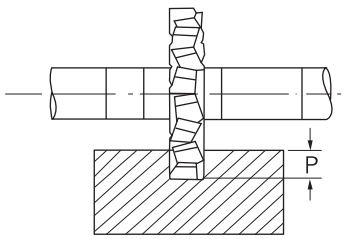
HSS-E, SIDE AND FACE MILLING CUTTERS WITH STAGGERED TEETH
HSS-E, SCHEIBENFRÄSER mit KREUZVERZAHNT

ML102 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS					~ HRc20				HRc20 ~ HRc30			
STRENGTH	~ 500N/mm²				500 ~ 800N/mm²				800 ~ 1000N/mm²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
50.0	160	130	25	0.058	115	85	20	0.053	95	58	15	0.044
63.0	125	160	25	0.080	90	75	20	0.052	75	51	15	0.043
80.0	100	145	25	0.081	70	69	20	0.055	60	48	15	0.044
100.0	80	130	25	0.081	60	60	20	0.050	47	41	15	0.044
125.0	63	100	25	0.072	45	54	20	0.055	38	38	15	0.045
160.0	50	105	25	0.081	37	48	20	0.050	30	34	15	0.044
200.0	40	95	25	0.079	31	45	20	0.048	25	31	15	0.041

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				ALUMINUM & ALUMINUM ALLOYS			
HARDNESS	HRc30 ~ HRc40							
STRENGTH	1000 ~ 1300N/mm²							
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
50.0	76	42	10	0.039	630	200	100	0.023
63.0	60	38	10	0.040	500	250	100	0.031
80.0	47	34	10	0.040	400	250	100	0.035
100.0	38	30	10	0.039	320	200	100	0.031
125.0	30	26	10	0.039	250	200	100	0.036
160.0	23	24	10	0.040	200	150	100	0.029
200.0	19	22	10	0.039	160	150	100	0.031

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



MILLING DEPTH P = WIDTH OF FACES

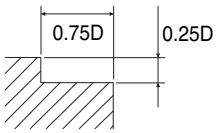
MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

HSSCo8, MULTI FLUTE SHELL END MILL
HSSCo8, MULTI SCHNEIDEN WALZENSTIRNFRÄSER

E2675 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS	~ HRc20				HRc20 ~ HRc28				HRc28 ~ HRc35				HRc35 ~ HRc40			
STRENGTH	~ 800N/mm²				800 ~ 900N/mm²				900 ~ 1100N/mm²				1100 ~ 1300N/mm²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
40.0	240	135	30	0.070	200	120	25	0.075	140	80	20	0.071	80	50	10	0.078
50.0	200	125	30	0.078	170	105	25	0.077	120	75	20	0.078	70	45	10	0.080
63.0	150	110	30	0.092	130	95	25	0.091	90	65	20	0.090	50	40	10	0.100
80.0	120	120	30	0.100	100	100	25	0.100	80	75	20	0.094	40	40	10	0.100
100.0	100	115	30	0.115	80	95	25	0.119	60	70	20	0.117	30	35	10	0.117
125.0	80	115	30	0.120	70	95	25	0.113	50	65	20	0.108	20	35	10	0.146
160.0	60	110	30	0.131	60	100	30	0.119	40	65	20	0.116	20	35	10	0.125

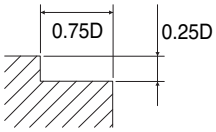


RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

HSSCo8, MULTI FLUTE SHELL END MILL for ALUMINUM
HSSCo8, MULTI SCHNEIDEN WALZENSTIRNFRÄSER für ALUMINIUM

E2676 SERIES

MATERIAL	ALUMINUM NONFERROUS METALS			
DIAMETER	RPM	FEED	Vc	fz
30.0	1050	210	100	0.050
40.0	840	200	105	0.060
50.0	600	250	95	0.069
60.0	500	300	95	0.100
63.0	480	330	95	0.115
75.0	450	350	105	0.130
80.0	390	300	100	0.128
100.0	320	290	100	0.151

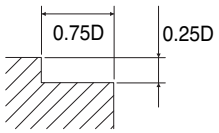


RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

HSSCo8, MULTI FLUTE ROUGHING SHELL END MILL
HSSCo8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPFRÄSER

E2677, E2678 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS	~ HRc20				HRc20 ~ HRc28				HRc28 ~ HRc35				HRc35 ~ HRc40			
STRENGTH	~ 800N/mm²				800 ~ 900N/mm²				900 ~ 1100N/mm²				1100 ~ 1300N/mm²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
40.0	240	100	30	0.069	200	85	25	0.071	140	60	20	0.071	80	35	10	0.073
50.0	200	125	30	0.078	170	105	25	0.077	120	75	20	0.078	70	45	10	0.080
63.0	150	110	30	0.092	130	95	25	0.091	90	65	20	0.090	50	40	10	0.100
80.0	120	120	30	0.100	100	100	25	0.100	80	75	20	0.094	40	40	10	0.100
100.0	100	115	30	0.115	80	95	25	0.119	60	70	20	0.117	30	35	10	0.117
125.0	80	115	30	0.120	70	95	25	0.113	50	65	20	0.108	20	35	10	0.146
160.0	60	110	30	0.153	60	100	30	0.139	40	65	20	0.135	20	35	10	0.146

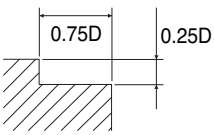


RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

HSSCo8, MULTI FLUTE ROUGHING & FINISHING SHELL END MILL
HSSCo8, MULTI SCHNEIDEN WALZENSTIRN-SCHRUPPSCHLICHTFRÄSER

E2679 SERIES

MATERIAL	CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS	~ HRc20				HRc20 ~ HRc28				HRc28 ~ HRc35				HRc35 ~ HRc40			
STRENGTH	~ 800N/mm²				800 ~ 900N/mm²				900 ~ 1100N/mm²				1100 ~ 1300N/mm²			
DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
40.0	240	100	30	0.069	200	85	25	0.071	140	60	20	0.071	80	35	10	0.073
50.0	200	125	30	0.078	170	105	25	0.077	120	75	20	0.078	70	45	10	0.080
63.0	150	110	30	0.092	130	95	25	0.091	90	65	20	0.090	50	40	10	0.100
80.0	120	120	30	0.100	100	100	25	0.100	80	75	20	0.094	40	40	10	0.100
100.0	100	115	30	0.115	80	95	25	0.119	60	70	20	0.117	30	35	10	0.117
125.0	80	115	30	0.120	70	95	25	0.113	50	65	20	0.108	20	35	10	0.146
160.0	60	110	30	0.153	60	100	30	0.139	40	65	20	0.135	20	35	10	0.146



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

MILLING CUTTERS

RECOMMENDED CUTTING CONDITIONS
EMPFOHLENE SCHNEIDKONDITIONEN

HSSCo8, 4 FLUTE CORNER ROUNDING CUTTERS
HSSCo8, 4 SCHNEIDEN VIERTELKREISFRÄSER

E2498 SERIES

MATERIAL		ALUMINUM & ALUMINUM ALLOYS				CARBON STEELS ALLOY STEELS			
HARDNESS									
STRENGTH						~ 500N/mm²			
OUTSIDE DIAMETER	CORNER RADIUS	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
8.0	R1	3500	245	90	0.018	800	55	20	0.017
9.0	R1.5	2800	230	80	0.021	630	55	20	0.022
10.0	R2	2800	220	90	0.020	630	50	20	0.020
11.0	R2.5	2400	220	85	0.023	530	45	20	0.021
12.0	R3	2400	210	90	0.022	530	45	20	0.021
14.0	R4	2000	200	90	0.025	450	45	20	0.025
16.0	R5	1600	200	80	0.031	350	40	20	0.029
20.0	R6	1400	190	90	0.034	310	40	20	0.032
24.0	R8	1200	180	90	0.038	260	40	20	0.038
28.0	R10	950	170	85	0.045	210	35	20	0.042
34.0	R12	800	160	85	0.050	180	35	20	0.049
48.0	R16	600	140	90	0.058	130	30	20	0.058

MATERIAL		CARBON STEELS ALLOY STEELS TOOL STEELS				CARBON STEELS ALLOY STEELS TOOL STEELS			
HARDNESS		~ HRc20				HRc20 ~ HRc35			
STRENGTH		500 ~ 800N/mm²				800 ~ 1100N/mm²			
OUTSIDE DIAMETER	CORNER RADIUS	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz
8.0	R1	600	35	15	0.015	480	35	10	0.018
9.0	R1.5	470	30	15	0.016	380	35	10	0.023
10.0	R2	470	30	15	0.016	380	30	10	0.020
11.0	R2.5	390	30	15	0.019	315	30	10	0.024
12.0	R3	390	30	15	0.019	315	30	10	0.024
14.0	R4	330	30	15	0.023	270	25	10	0.023
16.0	R5	260	30	15	0.029	210	25	10	0.030
20.0	R6	230	30	15	0.033	185	25	10	0.034
24.0	R8	190	30	15	0.039	155	25	10	0.040
28.0	R10	155	25	15	0.040	125	25	10	0.050
34.0	R12	130	25	15	0.048	105	20	10	0.048
48.0	R16	95	20	15	0.053	75	15	10	0.050

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