

Jongen Werkzeugtechnik GmbH & Co. KG

The New Milling System

Type 75



THE TOOL

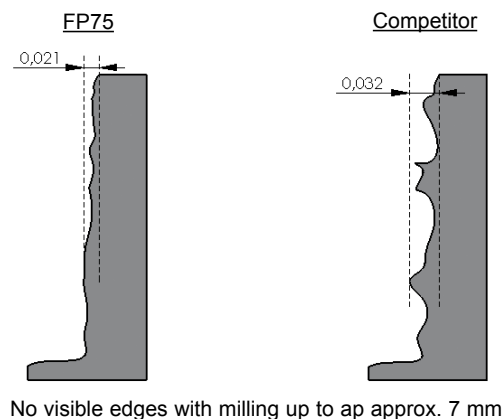
> New step milling programme ensure a smooth running of the machines, with highest productivity and precision.

CHARACTERISTICS

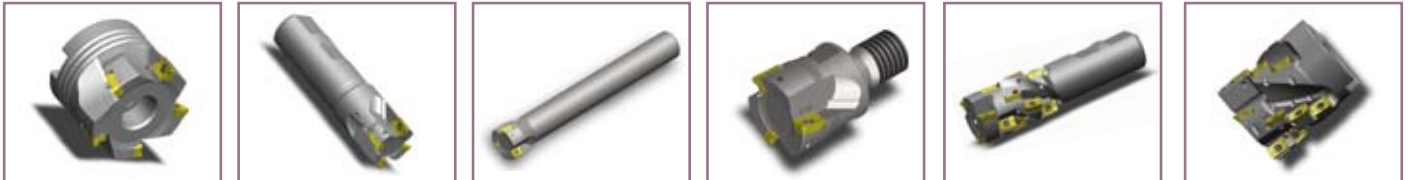
Multi-functional step-, slot- and contour milling.

> The positive cutting geometry allows a smooth running with lowest vibrations rate.

> Almost step-free milling can be obtained.



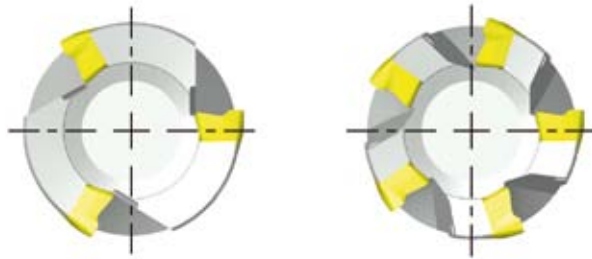
> The different tool versions shank-, screw-in-, shell- and multi-tooth milling cutters allow almost all usual milling operations.



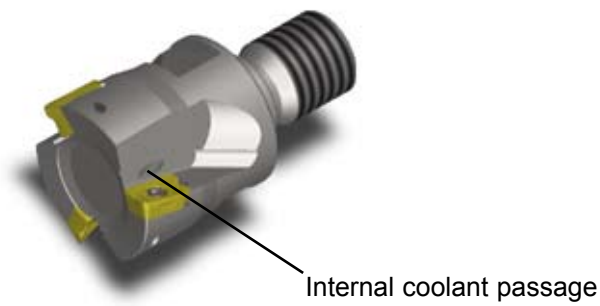
The different available versions are:

- Shell type cutters with normal and close tooth pitch, with diameter range 40-125 mm.
- Shank type milling cutters made to DIN1835-B, normal and close tooth pitch, diameters 20-40 mm
- Shank type milling cutters made to DIN1835-A, long version, diameter 20-32 mm
- Screw-in milling cutters for machining big cavities, diameters 20-40 mm.
- Multi-tooth milling cutters made to DIN1835-B, diameters 20-32 mm and as shell type mill with diameters available from 40-63 mm

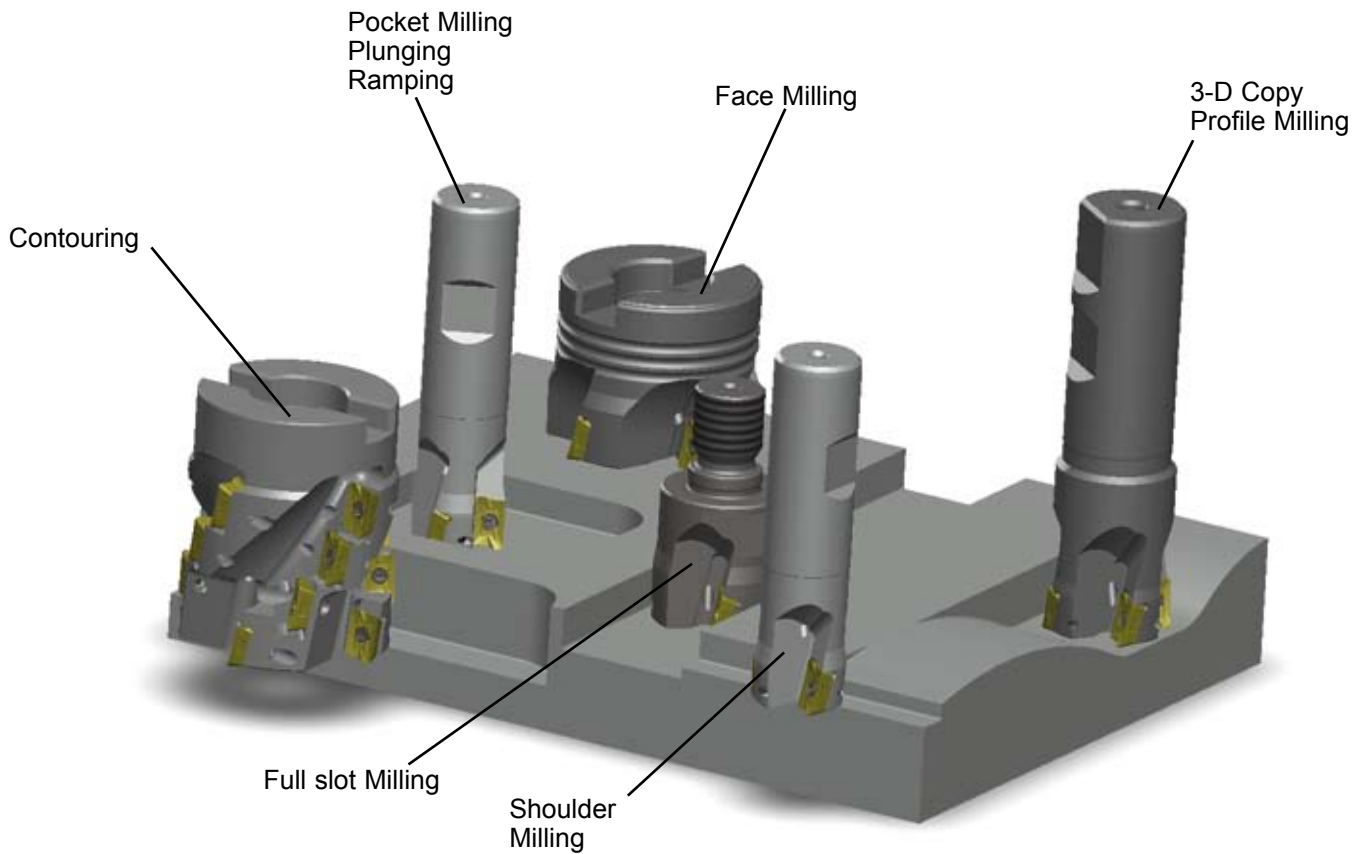
> Different numbers of teeth ensure the application in terms of roughing, finishing, big cavities etc.



> All tools include internal coolant passages



APPLICATION AREAS



THE INSERT

- > 2-edge step milling insert with a depth of cut (ap) of up to 10 mm, positive geometry.
- > The starting sales programme includes precision sintered as well as completely ground inserts, with different edge radii.



FP75

Precision sintered version



FP76

Completely ground Version

- > Almost all usual materials can be processed, that means from the aluminium machining, difficult materials, over the cast iron machining and the machining of different steels.

Following carbide qualities are offered:

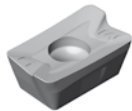
HT30



Code 29, Iso-Classification M20-M35

Hard wearing and tough, finest-grain carbide type with further developed multiple TiAlN coating. Especially for high grade, stainless-, austenitic, ferritic and martensitic steels.

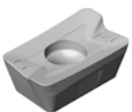
HT50



Code 22, Iso-Classification P30-P35

Very tough carbide type with a new developed TiAlN-coating for middle up to high cutting speeds for high tooth feed rates. This quality is especially suitable for dry milling. Application areas are roughing and finishing almost all materials such as, structural steel, tool steel, tempered steel, unalloyed, low alloyed and high grade steel, as well as grey cast iron, grey cast iron with globular graphite etc.

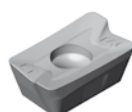
KT28



Code 23, Iso-Classification K15-K20

Very hard wearing carbide type with a new developed TiAlN-coating for medium to high cutting speeds with high tooth feed rates, for machining cast iron such as grey, tempered, vermicular, graphite and globular graphite cast iron.

K15M

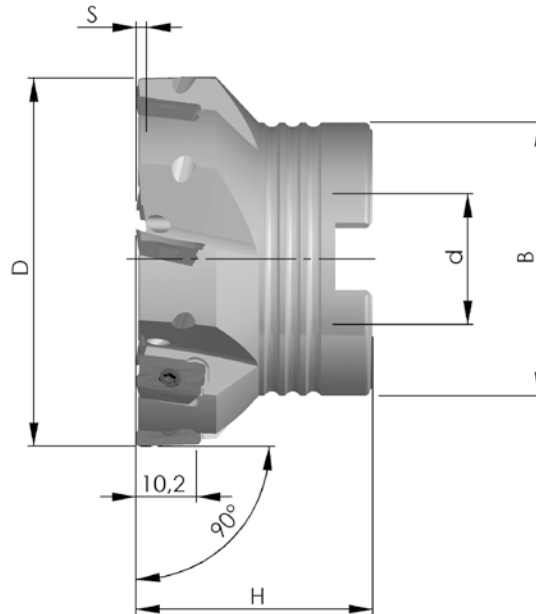


Code 8, Iso-Classification K10

Very hard wearing carbide type for machining aluminium up to approx. 8% Si, and all non-ferrous metals and plastics.

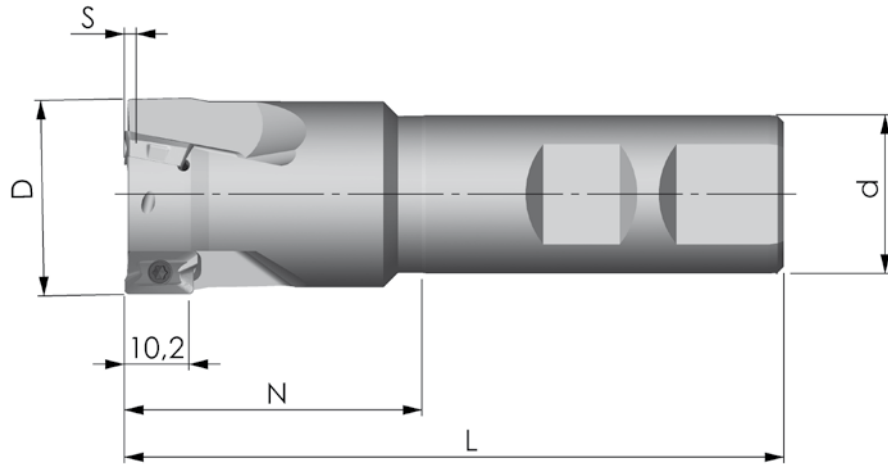
TECHNICAL DATA

Shell Type Milling Cutters



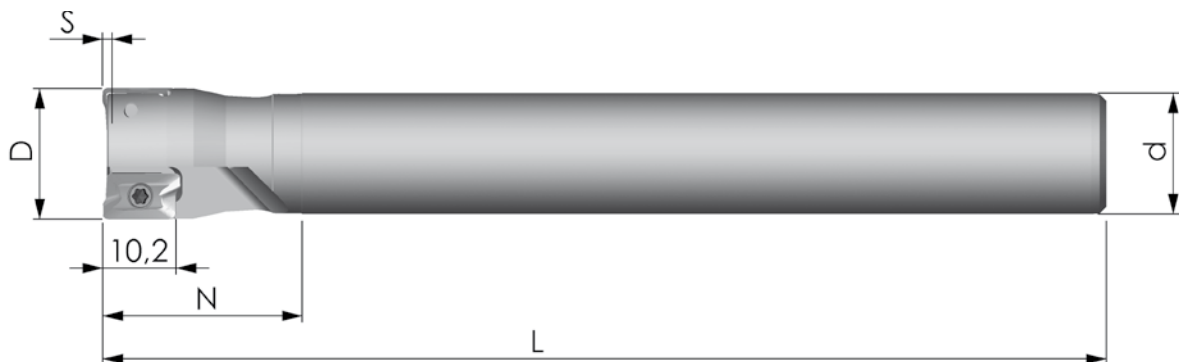
Order-Nr.	D	H	d	B	S	Z	MS
90PP-040-75-16-4	40	40	16	32	2,0	4	MS-8x25-912
90PP-040-75-22-4	40	40	22	38	2,0	4	MS-10x25-912
90PP-050-75-5	50	40	22	46	2,0	5	MS-10x25-912
90PP-063-75-5	63	40	22	46	2,0	5	MS-10x25-912
90PP-080-75-7	80	50	27	54	2,0	7	MS-12x35-912
90PP-100-75-9	100	50	32	64	2,0	9	MS-16x30-912
90PP-125-75-13	125	50	40	90	2,0	13	MS-20x45-7991
Close teeth pitch							
90PP-040-75-16-5	40	40	16	32	2,0	5	MS-8x25-912
90PP-040-75-22-5	40	40	22	38	2,0	5	MS-10x25-912
90PP-050-75-6	50	40	22	46	2,0	6	MS-10x25-912
90PP-063-75-7	63	40	22	46	2,0	7	MS-10x25-912
90PP-080-75-9	80	50	27	54	2,0	9	MS-12x35-912
90PP-100-75-12	100	50	32	64	2,0	12	MS-16x30-912

Shank Type Milling Cutters made to DIN 1835-B (Weldon)



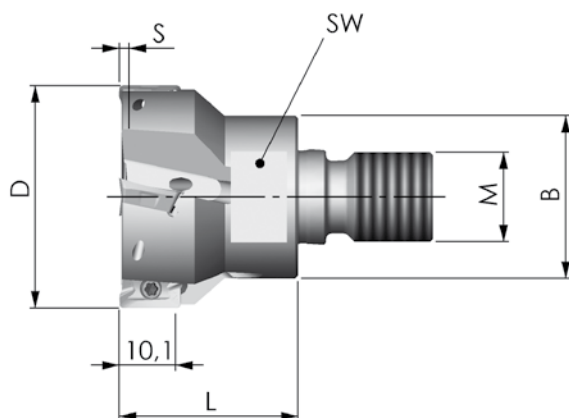
Order-Nr.	D	L	d	N	S	Z
90PP-20-32-75-2	20	82,4	20	32	2,0	2
90PP-20-50-75-2	20	100,4	20	50	2,0	2
90PP-22-33-75-3	22	83,3	20	33	2,0	3
90PP-25-38-75-3	25	95,2	25	38	2,0	3
90PP-25-60-75-3	25	117,2	25	60	2,0	3
90PP-28-42-75-4	28	98,4	25	42	2,0	4
90PP-30-45-75-4	30	101,3	25	45	2,0	4
90PP-32-48-75-3	32	104,3	25	48	2,0	3
90PP-32-60-75-3	32	116,3	25	60	2,0	3
90PP-36-48-75-5	36	104,2	25	48	2,0	5
90PP-40-48-75-5	40	104,1	25	48	2,0	5
Close teeth pitch						
90PP-20-30-75-3	20	81,8	20	30	2,0	3
90PP-25-38-75-4	25	95,2	25	38	2,0	4
90PP-32-48-75-5	32	104,3	25	48	2,0	5

Shank Type Milling Cutters made to DIN 1836 (cylindrical)



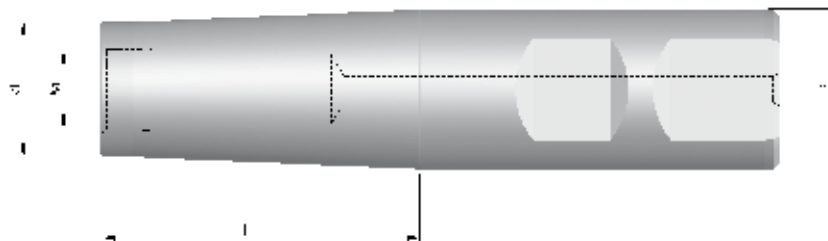
Order-Nr.	D	L	d	N	S	Z
90PP-20-75-2-150	20	150	18	30	2,0	2
90PP-25-75-2-170	25	170	20	32	2,0	2
90PP-32-75-3-195	32	195	25	30	2,0	3

Screw-In Cutters



Order-Nr.	D	L	M	B	SW	S	Z
ESF-20-27-M10-75-2	20	27	M10	18,0	SW16	2,0	2
ESF-25-32-M12-75-3	25	32	M12	21,0	SW18	2,0	3
ESF-32-32-M16-75-3	32	32	M16	29,0	SW24	2,0	3
ESF-40-32-M16-75-4	40	32	M16	29,0	SW24	2,0	4

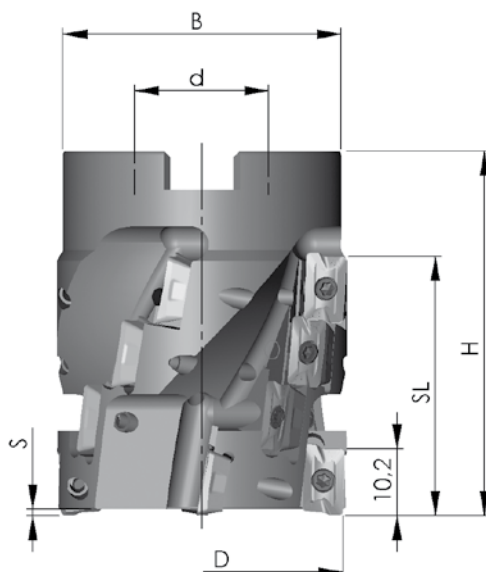
Screw-In Holders



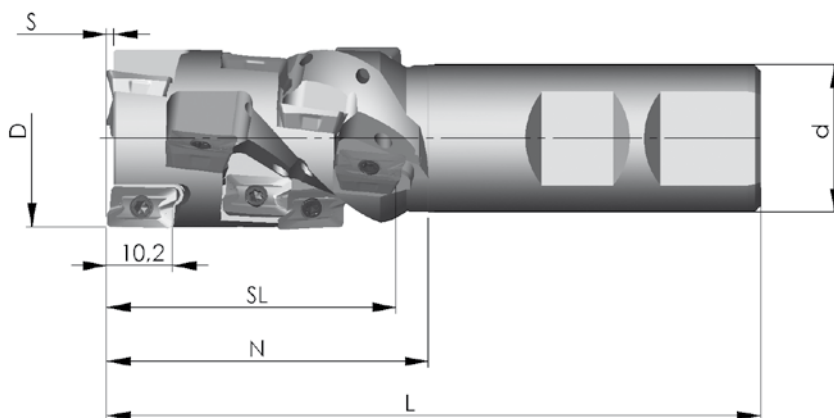
Order-Nr.	D	M	d	l
FS20W-M10-25	20	M10	18	25
FS20W-M10-45	20	M10	18	45
FS25W-M12-30	25	M12	21	30
FS25W-M12-50	25	M12	21	50
FS32W-M16-30	32	M16	29	30
FS32W-M16-50	32	M16	29	50

(For further holders: see our tool holder catalogue)

Multi-Tooth Milling Cutters





Order-Nr.	D	SL	H	d	B	S	Z _{eff.}	ZZ	MS
VZF-40-35-75-3 KD16	40	35	54	16	36	2,0	3	12	MS-8x25-912
VZF-50-35-75-4 KD22	50	35	60	22	46	2,0	4	16	MS-10x30-912
VZF-63-44-75-5 KD27	63	44	69	27	55	2,0	5	25	KS60








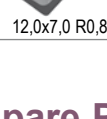
Order-Nr.	D	SL	N	L	d	S	Z _{eff.}	ZZ
VZF-20-18-20-75-2	20	20	50	100	20	2,0	2	4
VZF-25-27-25-75-2	25	27	54	110	25	2,0	2	6
VZF-28-27-25-75-2	28	27	54	110	25	2,0	2	6
VZF-32-44-25-75-3	32	44	54	110	25	2,0	3	12
VZF-32-44-32-75-3	32	44	60	120	32	2,0	3	12

Inserts




FP75

 12,0x7,0 R0,8	FP 75 (B17)	HT30 HT50 KT28	Precision sintered with chip breaker ☞ Application areas and parameters see page 10
 12,0x7,0 R0,4	FP 75 R0,4 (B17)	HT30 HT50 KT28	Precision sintered with chip breaker ☞ Application areas and parameters see page 10

FP76

 12,0x7,0 R0,2	FP 76 R0,2 (B17)	K15M	Precision ground with polished chip breaker ☞ Application areas and parameters see page 10
 12,0x7,0 R0,4	FP 76 R0,4 (B17)	HT30 HT50 KT28	Precision ground with chip breaker ☞ Application areas and parameters see page 10
 12,0x7,0 R0,4	FP 76 R0,4 (B17)	K15M	Precision ground with polished chip breaker ☞ Application areas and parameters see page 10
 12,0x7,0 R0,6	FP 76 R0,6 (B17)	HT30 HT50 KT28	Precision ground with chip breaker ☞ Application areas and parameters see page 10
 12,0x7,0 R0,6	FP 76 R0,6 (B17)	K15M	Precision ground with polished chip breaker ☞ Application areas and parameters see page 10
 12,0x7,0 R0,8	FP 76 R0,8 (B17)	HT30 HT50 KT28	Precision ground with chip breaker ☞ Application areas and parameters see page 10

Spare Parts

	SS2,5-7	Fixing screw
	T08+	Screw driver
	100g	Heavy duty grease

PARAMETERS STEP MILLING

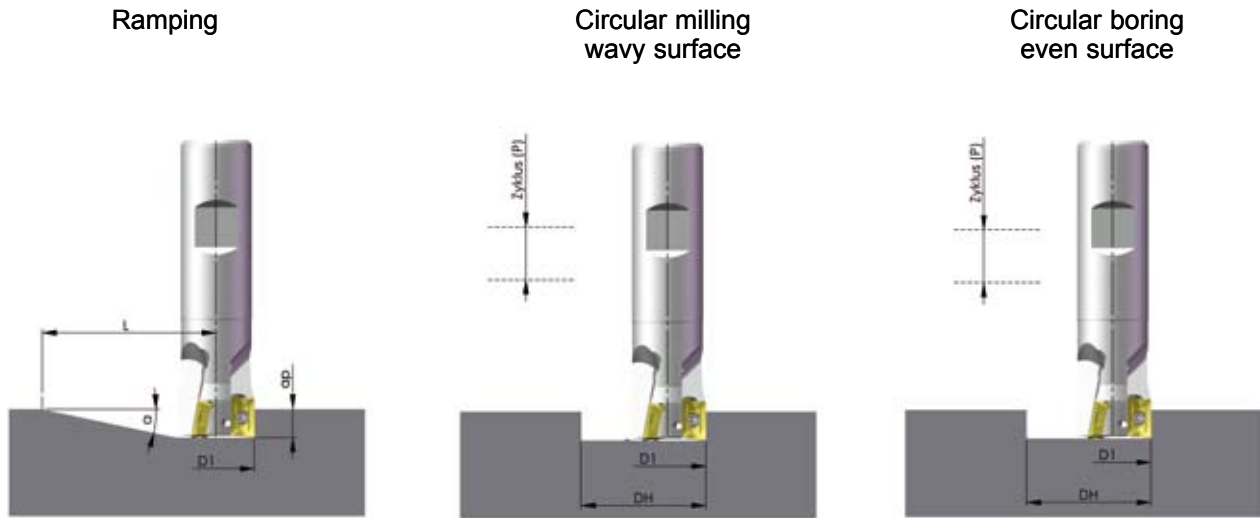
Material	Hardness	Quality	Depth of cut a_e [mm]	Cutting speed V_c [m/min.]	
P	Structural steel, Unalloyed steel	<180 HB	HT50	-0,25D	250 (200-350)
				-0,5D	
				-0,75D	
				>0,75D-1D	
	Tool steel, Heat-treatable steel, Alloyed steel	180-350 HB	HT50	-0,25D	220 (160-280)
				-0,5D	
				-0,75D	
				>0,75D-1D	
M	Stainless-steel, High grade steel, High alloyed steel,	<270 HB	HT30 (HT50)	-0,25D	240 (140-300)
				-0,5D	
				-0,75D	
				>0,75D-1D	
S	Heat-resistant super alloys Titan alloys		HT30 (HT50)	-0,25D	60 (40-200)
				-0,5D	
				-0,75D	
				>0,75D-1D	
H	Tempered steel	40-55 HRC	KT28	-0,25D	80 (50-120)
				-0,5D	
				-0,75D	
				>0,75D-1D	
K	Grey cast iron	<800 N/mm ²	KT28	-0,25D	250 (180-350)
				-0,5D	
				-0,75D	
				>0,75D-1D	
	Globular graphite cast iron	<350 N/mm ²	KT28 (HT50)	-0,25D	200 (130-280)
				-0,5D	
				-0,75D	
				>0,75D-1D	
N	Aluminium Non-ferrous metals	bis 12% Si	K15M	-0,25D	500 (500-1000)
				-0,5D	
				-0,75D	
				>0,75D-1D	

The above mentioned data are standard values.

Up and down corrections are admitted depending on the machine type, tool and holding fixture.

Feed rate per tooth f_z [mm]		
$\varnothing 20-28$	$\varnothing 30-50$	$\varnothing 63-125$
0,22 (0,18-0,30)	0,24 (0,18-0,30)	0,25 (0,18-0,30)
0,20 (0,18-0,28)	0,21 (0,18-0,28)	0,23 (0,18-0,28)
0,15 (0,50-0,25)	0,17 (0,50-0,25)	0,18 (0,50 -0,25)
0,12 (0,10-0,25)	0,14 (0,10-0,25)	0,15 (0,10-0,25)
0,22 (0,18-0,30)	0,23 (0,10-0,30)	0,25 (0,10-0,30)
0,20 (0,18-0,28)	0,21 (0,10-0,28)	0,23 (0,10-0,28)
0,15 (0,50-0,25)	0,18 (0,10-0,25)	0,18 (0,10-0,25)
0,12 (0,10-0,25)	0,13 (0,10-0,25)	0,15 (0,10-0,25)
0,18 (0,10-0,30)	0,19 (0,10-0,30)	0,20 (0,10-0,30)
0,12 (0,05-0,25)	0,13 (0,05-0,25)	0,14 (0,05-0,25)
0,10 (0,05-0,25)	0,13 (0,05-0,25)	0,12 (0,05-0,25)
0,10 (0,05-0,25)	0,11 (0,10-0,25)	0,13 (0,10-0,25)
0,18 (0,10-0,30)	0,19 (0,10-0,30)	0,20 (0,10-0,30)
0,12 (0,05-0,25)	0,13 (0,05-0,25)	0,14 (0,05-0,25)
0,10 (0,05-0,25)	0,13 (0,05-0,25)	0,12 (0,05-0,25)
0,08 (0,05-0,25)	0,09 (0,10-0,25)	0,10 (0,10-0,25)
0,10 (0,08-0,25)	0,10 (0,08-0,25)	0,10 (0,08-0,25)
0,07 (0,05-0,25)	0,07 (0,05-0,25)	0,07 (0,05-0,25)
0,06 (0,05-0,25)	0,06 (0,05-0,25)	0,06 (0,05-0,25)
0,05 (0,03-0,15)	0,05 (0,03-0,15)	0,05 (0,03-0,15)
0,27 (0,20-0,35)	0,29 (0,20-0,35)	0,30 (0,20-0,35)
0,26 (0,20-0,35)	0,27 (0,20-0,35)	0,28 (0,20-0,35)
0,21 (0,20-0,35)	0,22 (0,20-0,35)	0,23 (0,20-0,35)
0,19 (0,15-0,30)	0,20 (0,15-0,30)	0,20 (0,15-0,30)
0,27 (0,20-0,35)	0,29 (0,20-0,35)	0,30 (0,20-0,35)
0,26 (0,20-0,35)	0,27 (0,20-0,35)	0,28 (0,20-0,35)
0,21 (0,20-0,35)	0,22 (0,20-0,35)	0,23 (0,20-0,35)
0,19 (0,15-0,30)	0,20 (0,15-0,30)	0,20 (0,15-0,30)
0,42 (0,20-0,50)	0,43 (0,20-0,50)	0,45 (0,20-0,50)
0,37 (0,20-0,50)	0,39 (0,20-0,50)	0,40 (0,20-0,50)
0,32 (0,20-0,50)	0,34 (0,20-0,50)	0,35 (0,20-0,50)
0,27 (0,20-0,40)	0,29 (0,20-0,40)	0,30 (0,20-0,40)

PARAMETERS PROFILE MILLING AND CIRCULAR MILLING



D1	Ramping Angle		Circular boring (flat surface)				Circular milling (wavy surface)	
	Anlge of lead max. α (°)	Processing distance min. L (mm)	Diam. max. DH (mm)	Depth of cut max. cycle P (mm)	Diam. min. DH (mm)	Depth of cut max. cycle P (mm)	Diam. min. DH (mm)	Depth of cut max. cycle P (mm)
20	8,7	52	39,2	4,6	38	4,3	33,5	3,3
22	7,6	60	43,2	4,4	42	4,2	37,5	3,2
25	6,3	72	49,2	4,2	48	4,0	43,5	3,2
28	5,4	84	55,2	4,1	54	3,9	49,5	3,2
30	5,0	92	59,2	4,0	58	3,8	53,5	3,2
32	4,6	100	63,2	3,9	62	3,8	57,5	3,2
36	3,9	116	71,2	3,8	70	3,7	65,5	3,2
40	3,5	132	79,2	3,7	78	3,6	73,5	3,2
50	2,7	172	99,2	3,6	98	3,5	93,5	3,2
63	2,0	224	125,2	3,5	124	3,4	119,5	3,2
80	1,6	292	159,2	3,4	158	3,4	153,5	3,2
100	1,2	372	199,2	3,4	198	3,3	193,5	3,2
125	1,0	472	249,2	3,3	248	3,3	243,5	3,2

Formula for calculating the max. angle of immersion:

$$\tan \alpha = \frac{s}{(D-7)}$$

s = Variable (see above)
 7 = Insert's width
 D = Tool diam.

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