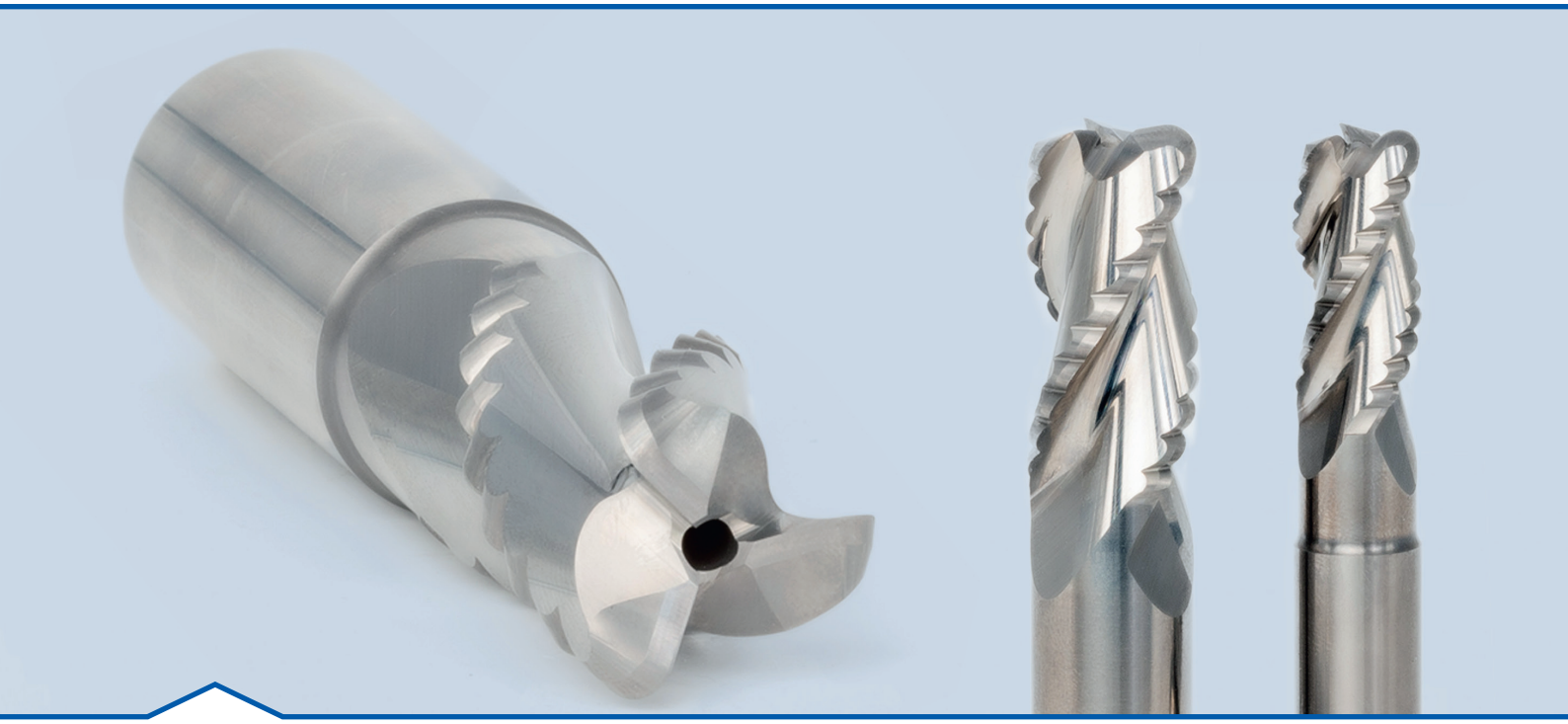
MILLER
MAPAL GROUP



Your technology partner for cost-effective machining

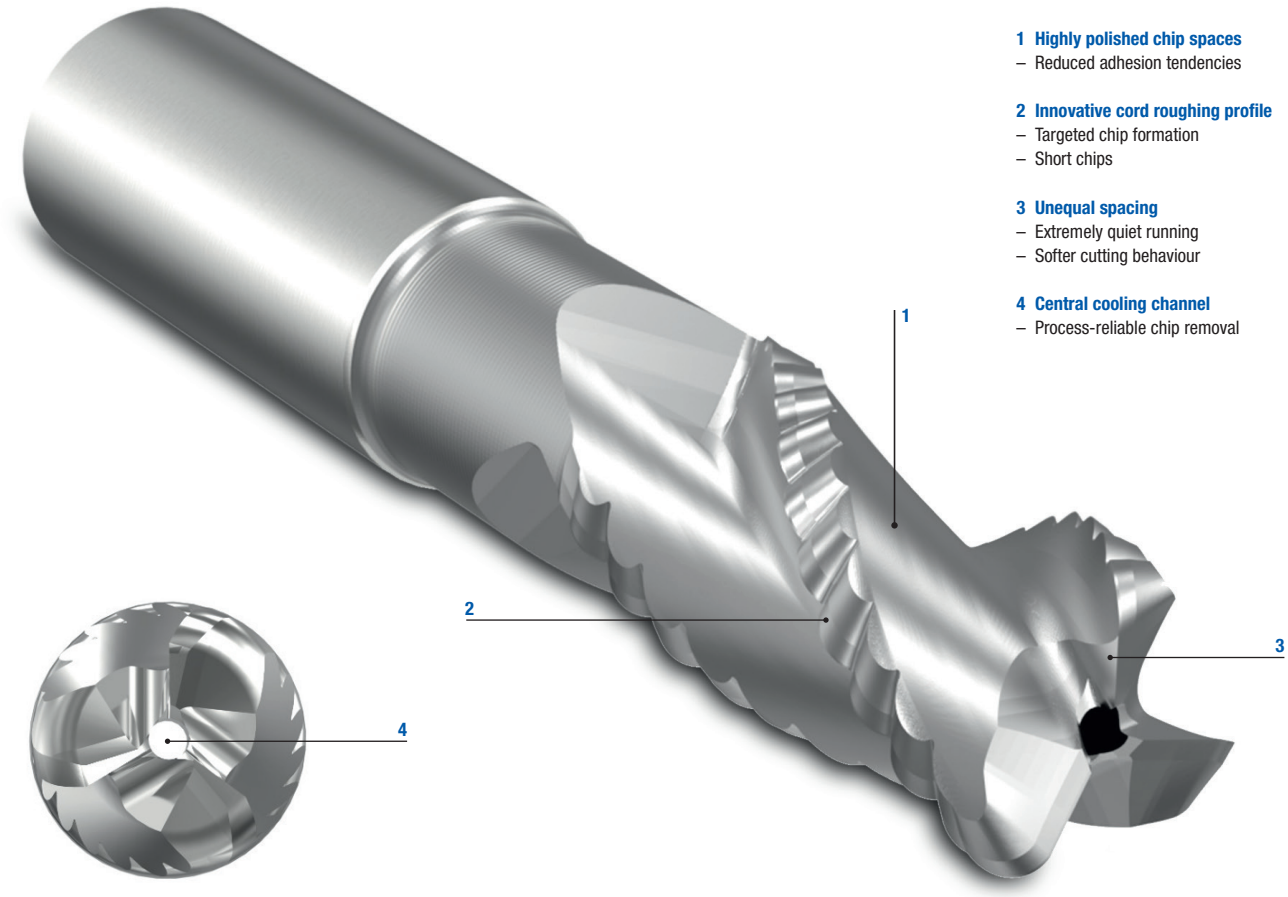
OptiMill®-Alu-Wave

OptiMill®-Alu-Wave

A new dimension of high-volume aluminium machining

The OptiMill-Alu-Wave is a newly developed roughing cutter for machining aluminium materials. It produces short chips and ensures smooth cutting behaviour thanks to its unique cord roughing geometry. The milling cutter has a central cooling channel that minimises the formation of built-up edges and safely removes chips. It also offers configurable corner radii for precise near-contour roughing.

Due to its high machining volume, the OptiMill-Alu-Wave allows efficient material removal and, in this way, increases productivity. Available in various lengths, it adapts perfectly to the individual requirements of any roughing task.



1 Highly polished chip spaces
– Reduced adhesion tendencies

2 Innovative cord roughing profile
– Targeted chip formation
– Short chips

3 Unequal spacing
– Extremely quiet running
– Softer cutting behaviour

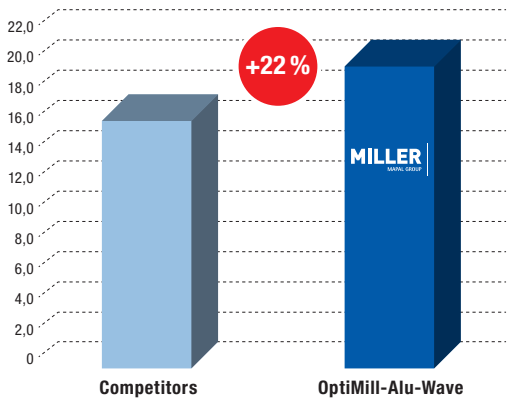
4 Central cooling channel
– Process-reliable chip removal

Features

Preferred series available from stock
– Versions: long, overlong, extra long cantilever length with neck
– Ø area: 12.00 - 25.00 mm
– Shank form: HA

Configurable features:
– Ø area: 12.00 - 25.00 mm
– Shank form: HB | SL (Safe-λock®)
– Cutting edge design: Radius | Chamfer 45° of ø 12.00 – 25.00 mm | 0.40 – 1.00 mm
– Coating: Available as DLC coating with cutting material HP910

MATERIAL REMOVAL RATE [dm³/min]



Workpiece material: EN-AW50

Tool ø:	25.00 mm
Spindle speed:	24,465 mm^{-1}
Feed:	26.738 mm/min
Material removal rate:	20.1 dm^3/min

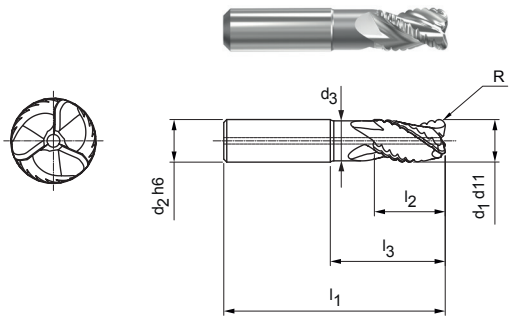
OptiMill®-Alu-Wave

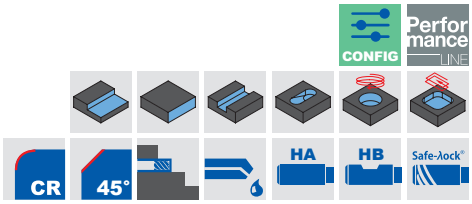
Shoulder milling cutter, long projection length with neck, with internal coolant supply
M3582

Design:

Diameter of milling cutter:	12.00 - 25.00 mm
Coating:	Uncoated
Number of cutting edges:	3
Helix angle:	36°

Application:
Before using in the machine, check the cutting data according to machine performance (see cutting data).





Preferred series available from stock | Long projection length

Dimensions							z	Specification	Order no.
d_1 d11	d_2 h6	d_3	l_1	l_2	l_3	R			
12,00	12	11,2	83	22	36	2,00	3	M3582-1200AU-R0200	31430485
16,00	16	15,1	92	26	42	3,00	3	M3582-1600AU-R0300	31430488
20,00	20	18,8	104	32	54	3,00	3	M3582-2000AU-R0300	31430551
20,00	20	18,8	104	32	54	4,00	3	M3582-2000AU-R0400	31430552
25,00	25	23,5	114	40	58	3,00	3	M3582-2500AU-R0300	31430559
25,00	25	23,5	114	40	58	4,00	3	M3582-2500AU-R0400	31430560

Configurable features

Shank form:
Shank form: HB | SL (Safe-λock®)

Cutting edge design:
Radius R: 0.40 - 6.50 mm
Chamfer Cx45°: 0.40 - 1.00 mm

Coating:
Available as DLC coating with coating MF8

Specification:
M3582-2500**[shank form][coating][cutting edge design]**

Dimensions of configurable radii and corner chamfers

d_1	Radius R		Chamfer Cx45°	
	R min.	R max.	Cx45° min.	Cx45° max.
12,00	0,40	3,00	0,40	1,00
16,00	0,50	4,00	0,40	1,00
20,00	0,60	5,20	0,40	1,00
25,00	0,75	6,50	0,40	1,00

Example:
M3582-2500 **S 02 R0150**

Radius 1.50 mm
Coating MF8
Shank form S

Safe-λock® by HAIMER
Manufacturer's ID number: 6272

Dimensions in mm.
For cutting data recommendation, see pages 6/7.
Special designs and other coatings available upon request.

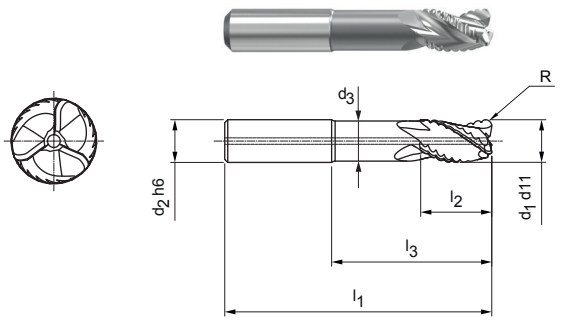
OptiMill®-Alu-Wave

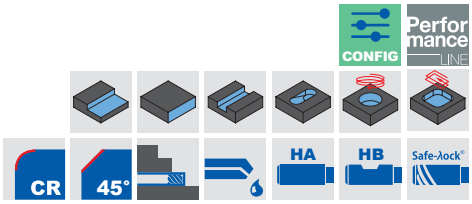
Shoulder milling cutter, overlong projection length with neck, with internal coolant supply
M3582

Design:

Diameter of milling cutter:	12.00 - 25.00 mm
Coating:	Uncoated
Number of cutting edges:	3
Helix angle:	36°

Application:
Before using in the machine, check the cutting data according to machine performance (see cutting data).





Preferred series available from stock | Overlong projection length

Dimensions							z	Specification	Order no.
d_1 d11	d_2 h6	d_3	l_1	l_2	l_3	R			
12,00	12	11,2	95	26	50	2,00	3	M3582-1200AU-R0200	31430486
16,00	16	15,1	115	32	65	3,00	3	M3582-1600AU-R0300	31430489
20,00	20	18,8	125	32	75	3,00	3	M3582-2000AU-R0300	31430553
20,00	20	18,8	125	32	75	4,00	3	M3582-2000AU-R0400	31430556
25,00	25	23,5	136	50	80	3,00	3	M3582-2500AU-R0300	31430561
25,00	25	23,5	136	50	80	4,00	3	M3582-2500AU-R0400	31430562

Configurable features

Shank form:
Shank form: HB | SL (Safe-λock®)

Cutting edge design:
Radius R: 0.40 - 6.50 mm
Chamfer Cx45°: 0.40 - 1.00 mm

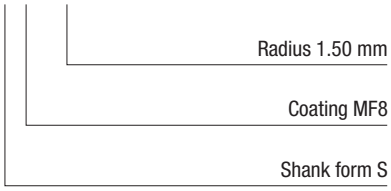
Coating:
Available as DLC coating with coating MF8

Specification:
M3582-2500**[shank form][coating][cutting edge design]**

Dimensions of configurable radii and corner chamfers

d_1	Radius R		Chamfer Cx45°	
	R min.	R max.	Cx45° min.	Cx45° max.
12,00	0,40	3,00	0,40	1,00
16,00	0,50	4,00	0,40	1,00
20,00	0,60	5,20	0,40	1,00
25,00	0,75	6,50	0,40	1,00

Example:
M3582-2500 **S 02 R0150**



Safe-λock® by HAIMER
Manufacturer's ID number: 6272

Dimensions in mm.
For cutting data recommendation, see pages 6/7.
Special designs and other coatings available upon request.

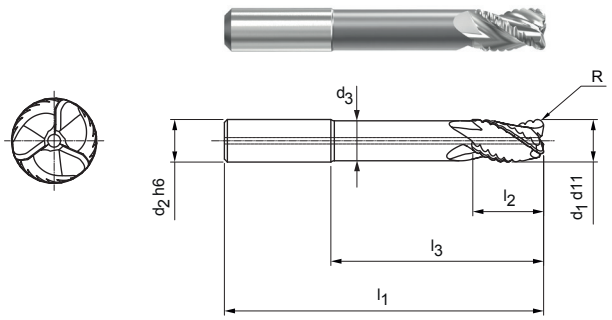
OptiMill®-Alu-Wave

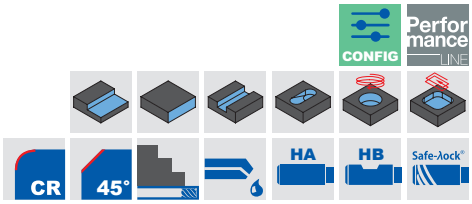
Shoulder milling cutter, extra long projection length with neck, with internal coolant supply
M3582

Design:

Diameter of milling cutter:	12.00 - 25.00 mm
Coating:	Uncoated
Number of cutting edges:	3
Helix angle:	36°

Application:
Before using in the machine, check the cutting data according to machine performance (see cutting data).





Preferred series available from stock | Extra long projection length

Dimensions							z	Specification	Order no.
d_1 d11	d_2 h6	d_3	l_1	l_2	l_3	R			
12,00	12	11,2	106	16	60	2,00	3	M3582-1200AU-R0200	31430487
16,00	16	15,1	129	24	80	3,00	3	M3582-1600AU-R0300	31430550
20,00	20	18,8	150	32	100	3,00	3	M3582-2000AU-R0300	31430557
20,00	20	18,8	150	32	100	4,00	3	M3582-2000AU-R0400	31430558
25,00	25	23,5	163	42	107	3,00	3	M3582-2500AU-R0300	31430563
25,00	25	23,5	163	42	107	4,00	3	M3582-2500AU-R0400	31430564

Configurable features

Shank form:
Shank form: HB | SL (Safe-λock®)

Cutting edge design:
Radius R: 0.40 - 6.50 mm
Chamfer Cx45°: 0.40 - 1.00 mm

Coating:
Available as DLC coating with coating MF8

Specification:
M3582-2500**[shank form][coating][cutting edge design]**

Dimensions of configurable radii and corner chamfers

d_1	Radius R		Chamfer Cx45°	
	R min.	R max.	Cx45° min.	Cx45° max.
12,00	0,40	3,00	0,40	1,00
16,00	0,50	4,00	0,40	1,00
20,00	0,60	5,20	0,40	1,00
25,00	0,75	6,50	0,40	1,00

Example:
M3582-2500 **S 02 R0150**

Radius 1.50 mm
Coating MF8
Shank form S

Safe-λock® by HAIMER
Manufacturer's ID number: 6272

Dimensions in mm.
For cutting data recommendation, see pages 6/7.
Special designs and other coatings available upon request.

Cutting data recommendations for shoulder milling cutters

Feed and cutting speed

OptiMill-Alu-Wave | M3582 | Machine performance 25 kW to ≤40 kW

MMG*			Workpiece material	Strength/hardness [N/mm²] [HRC]	Cooling			
					MQL/Air	Dry	Wet	
N	N1	N1.1	Aluminium, unalloyed and alloyed < 3% Si				✓	
		N1.2	Aluminium, alloyed ≤ 7% Si				✓	
		N1.3	Aluminium, alloyed > 7 - 12% Si				✓	
		N1.4	Aluminium, alloyed > 12% Si				✓	

OptiMill-Alu-Wave | M3582 | Machine performance 40 kW to ≤80 kW

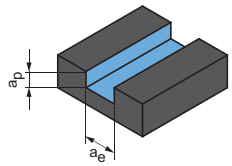
MMG*			Workpiece material	Strength/hardness [N/mm²] [HRC]	Cooling			
					MQL/Air	Dry	Wet	
N	N1	N1.1	Aluminium, unalloyed and alloyed < 3% Si				✓	
		N1.2	Aluminium, alloyed ≤ 7% Si				✓	
		N1.3	Aluminium, alloyed > 7 - 12% Si				✓	
		N1.4	Aluminium, alloyed > 12% Si				✓	

OptiMill-Alu-Wave | M3582 | Machine performance >80 kW

MMG*			Workpiece material	Strength/hardness [N/mm²] [HRC]	Cooling			
					MQL/Air	Dry	Wet	
N	N1	N1.1	Aluminium, unalloyed and alloyed < 3% Si				✓	
		N1.2	Aluminium, alloyed ≤ 7% Si				✓	
		N1.3	Aluminium, alloyed > 7 - 12% Si				✓	
		N1.4	Aluminium, alloyed > 12% Si				✓	

* MILLER machining groups

Full cutting

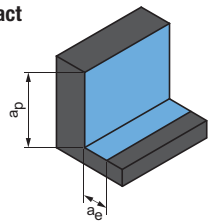


Long projection length
a_p = 1xD | a_e = 1xD

Overlong projection length
a_p = 1xD | a_e = 1xD

Extra long projection length
a_p = 0.5xD | a_e = 1xD

Part-contact cutting



Long projection length
a_p = 1.5xD | a_e = 0.6xD

Overlong projection length
a_p = 1.5xD | a_e = 0.4xD

Extra long projection length
a_p = 1.5xD | a_e = 0.25xD

	Feed per tooth [f_z] [mm/tooth] for diameter of milling cutter					Feed per tooth [f_z] [mm/tooth] for diameter of milling cutter			
Ø	12.00	16.00	20.00	25.00	Ø	12.00	16.00	20.00	25.00
v_c	600 - 900	600 - 900	300 - 600	300 - 600	**v_c**	600 - 900	600 - 900	400 - 700	300 - 600
Factor **v_c**					Factor **v_c**				
1	0.1 - 0.18	0.12 - 0.2	0.15 - 0.2	0.15 - 0.2	**1**	0.12 - 0.22	0.15 - 0.22	0.15 - 0.22	0.15 - 0.22
0.95	0.1 - 0.18	0.12 - 0.2	0.15 - 0.2	0.15 - 0.2	**0.95**	0.12 - 0.22	0.15 - 0.22	0.15 - 0.22	0.15 - 0.22
0.85	0.1 - 0.18	0.12 - 0.2	0.15 - 0.2	0.15 - 0.2	**0.85**	0.12 - 0.22	0.15 - 0.22	0.15 - 0.22	0.15 - 0.22
0.75	0.1 - 0.18	0.12 - 0.2	0.15 - 0.2	0.15 - 0.2	**0.75**	0.12 - 0.22	0.15 - 0.22	0.15 - 0.22	0.15 - 0.22

	Feed per tooth [f_z] [mm/tooth] for diameter of milling cutter					Feed per tooth [f_z] [mm/tooth] for diameter of milling cutter			
Ø	12.00	16.00	20.00	25.00	Ø	12.00	16.00	20.00	25.00
v_c	900 - 1200	1100 - 1400	1100 - 1400	900 - 1200	**v_c**	900 - 1200	1100 - 1400	1100 - 1400	900 - 1200
Factor **v_c**					Factor **v_c**				
1	0.1 - 0.18	0.12 - 0.2	0.14 - 0.21	0.15 - 0.22	**1**	0.1 - 0.22	0.15 - 0.25	0.15 - 0.25	0.15 - 0.25
0.95	0.1 - 0.18	0.12 - 0.2	0.14 - 0.21	0.15 - 0.22	**0.95**	0.1 - 0.22	0.15 - 0.25	0.15 - 0.25	0.15 - 0.25
0.85	0.1 - 0.18	0.12 - 0.2	0.14 - 0.21	0.15 - 0.22	**0.85**	0.1 - 0.22	0.15 - 0.25	0.15 - 0.25	0.15 - 0.25
0.75	0.1 - 0.18	0.12 - 0.2	0.14 - 0.21	0.15 - 0.22	**0.75**	0.1 - 0.22	0.15 - 0.25	0.15 - 0.25	0.15 - 0.25

	Feed per tooth [f_z] [mm/tooth] for diameter of milling cutter					Feed per tooth [f_z] [mm/tooth] for diameter of milling cutter			
Ø	12.00	16.00	20.00	25.00	Ø	12.00	16.00	20.00	25.00
v_c	900 - 1200	1100 - 1400	1300 - 1600	1700 - 2500	**v_c**	900 - 1200	1100 - 1400	1300 - 1600	1700 - 2500
Factor **v_c**					Factor **v_c**				
1	0.1 - 0.18	0.12 - 0.2	0.15 - 0.23	0.15 - 0.23	**1**	0.1 - 0.22	0.13 - 0.25	0.15 - 0.27	0.15 - 0.27
0.95	0.1 - 0.18	0.12 - 0.2	0.15 - 0.23	0.15 - 0.23	**0.95**	0.1 - 0.22	0.13 - 0.25	0.15 - 0.27	0.15 - 0.27
0.85	0.1 - 0.18	0.12 - 0.2	0.15 - 0.23	0.15 - 0.23	**0.85**	0.1 - 0.22	0.13 - 0.25	0.15 - 0.27	0.15 - 0.27
0.75	0.1 - 0.18	0.12 - 0.2	0.15 - 0.23	0.15 - 0.23	**0.75**	0.1 - 0.22	0.13 - 0.25	0.15 - 0.27	0.15 - 0.27

The specified machining values are guide values.
The optimum data for the respective machining task should be determined during the test or machining.

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