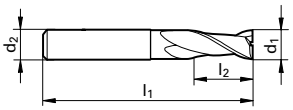
MILLING CUTTERS

2 FLUTE METRIC CENTRE CUTTING - HSCO

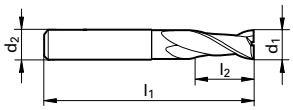
Guhring no.	3451
Standard	DIN 327 D
Tool material	M42
Surface	◯
Type	N
Helix	30°
Tolerance	e8/h10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
1.000	6.000	47.00	2.00	2	•
1.500	6.000	47.00	3.00	2	•
2.000	6.000	48.00	4.00	2	•
2.500	6.000	49.00	5.00	2	•
3.000	6.000	49.00	5.00	2	•
3.500	6.000	50.00	6.00	2	•
4.000	6.000	51.00	7.00	2	•
5.000	6.000	52.00	8.00	2	•
6.000	6.000	52.00	8.00	2	•
7.000	10.000	60.00	10.00	2	•
8.000	10.000	61.00	11.00	2	•
9.000	10.000	61.00	11.00	2	•
10.000	10.000	63.00	13.00	2	•
11.000	12.000	70.00	13.00	2	•
12.000	12.000	73.00	16.00	2	•
14.000	12.000	73.00	16.00	2	•
15.000	12.000	73.00	16.00	2	•
16.000	16.000	79.00	19.00	2	•
18.000	16.000	79.00	19.00	2	•
20.000	20.000	88.00	22.00	2	•
25.000	25.000	102.00	26.00	2	•

2 FLUTE METRIC EX LONG CENTRE CUTTING - HSCO

Guhring no.	3453
Standard	DIN 844 L
Tool material	M42
Surface	◯
Type	N
Helix	30°
Tolerance	h10

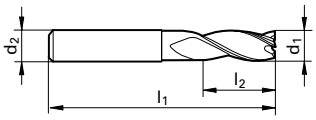


d1	d2	l1	12	z	AVAILABILITY
mm	mm	mm	mm		
3.00	6.000	56.00	12.00	2	•
4.00	6.000	63.00	19.00	2	•
5.00	6.000	68.00	24.00	2	•
6.00	6.000	68.00	24.00	2	•
8.00	10.000	88.00	38.00	2	•
10.00	10.000	95.00	45.00	2	•
12.00	12.000	110.00	53.00	2	•
14.00	12.000	110.00	53.00	2	•
16.00	16.000	123.00	63.00	2	•
18.00	16.000	123.00	63.00	2	•
20.00	20.000	141.00	75.00	2	•

◯ Bright ◯ Steam Tempered ◓ Nitrided Lands (S) S-Coated (TiN) (A) A-Coated (TiAlN) (C) C-Coated (TiCN) (F) F-Coated (FIRE)

3 FLUTE METRIC
CENTRE CUTTING - HSCO

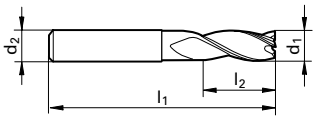
Guhring no.	3459
Standard	DIN 844 K
Tool material	M42
Surface	◯
Type	N
Helix	30°
Tolerance	e8/h10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
3.000	6.000	52.00	8.00	3	•
4.000	6.000	55.00	11.00	3	•
5.000	6.000	57.00	13.00	3	•
6.000	6.000	57.00	13.00	3	•
7.000	10.000	66.00	16.00	3	•
8.000	10.000	69.00	19.00	3	•
9.000	10.000	69.00	19.00	3	•
10.000	10.000	72.00	22.00	3	•
12.000	12.000	83.00	26.00	3	•
14.000	12.000	83.00	26.00	3	•
16.000	16.000	92.00	32.00	3	•
18.000	16.000	92.00	32.00	3	•
20.000	20.000	104.00	38.00	3	•

3 FLUTE METRIC
EX LONG CENTRE CUTTING - HSCO

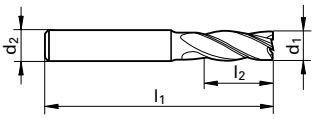
Guhring no.	3460
Standard	DIN 844 L
Tool material	M42
Surface	◯
Type	N
Helix	30°
Tolerance	h10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
3.000	6.000	56.00	12.00	3	•
4.000	6.000	63.00	19.00	3	•
5.000	6.000	68.00	24.00	3	•
6.000	6.000	68.00	24.00	3	•
8.000	10.000	88.00	38.00	3	•
10.000	10.000	95.00	45.00	3	•
12.000	12.000	110.00	53.00	3	•
14.000	12.000	110.00	53.00	3	•
16.000	16.000	123.00	63.00	3	•
18.000	16.000	123.00	63.00	3	•
20.000	20.000	141.00	75.00	3	•

4 FLUTE METRIC CENTRE CUTTING - HSCO

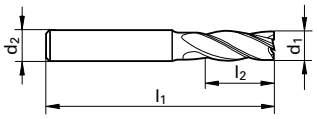
Guhring no.	3428
Standard	DIN 844 K
Tool material	M42
Surface	○
Type	N
Helix	30°
Tolerance	k10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
2.000	6.000	51.00	7.00	4	•
2.500	6.000	52.00	8.00	4	•
3.000	6.000	52.00	8.00	4	•
4.000	6.000	55.00	11.00	4	•
5.000	6.000	57.00	13.00	4	•
6.000	6.000	57.00	13.00	4	•
7.000	10.000	66.00	16.00	4	•
8.000	10.000	69.00	19.00	4	•
10.000	10.000	72.00	22.00	4	•
11.000	12.000	79.00	22.00	4	•
12.000	12.000	83.00	26.00	4	•
13.000	12.000	83.00	26.00	4	•
14.000	12.000	83.00	26.00	4	•
16.000	16.000	92.00	32.00	4	•
18.000	16.000	92.00	32.00	4	•
20.000	20.000	104.00	38.00	4	•
25.000	25.000	121.00	45.00	6	•
30.000	25.000	121.00	45.00	6	•
32.000	32.000	133.00	53.00	6	•

4 FLUTE METRIC EX LONG CENTRE CUTTING - HSCO

Guhring no.	3431
Standard	DIN 844 L
Tool material	M42
Surface	○
Type	N
Helix	30°
Tolerance	k10

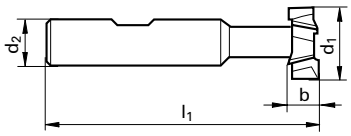


d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
3.000	6.000	56.00	12.00	4	•
4.000	6.000	63.00	19.00	4	•
5.000	6.000	68.00	24.00	4	•
6.000	6.000	68.00	24.00	4	•
7.000	10.000	80.00	30.00	4	
8.000	10.000	88.00	38.00	4	•
9.000	10.000	88.00	38.00	4	•
10.000	10.000	95.00	45.00	4	•
11.000	12.000	102.00	45.00	4	
12.000	12.000	110.00	53.00	4	•
14.000	12.000	110.00	53.00	4	•
15.000	12.000	110.00	53.00	4	
16.000	16.000	123.00	63.00	4	•
18.000	16.000	123.00	63.00	4	•
20.000	20.000	141.00	75.00	4	•
25.000	25.000	166.00	90.00	6	•
28.000	25.000	166.00	90.00	6	
30.000	25.000	166.00	90.00	6	•
32.000	32.000	186.00	106.00	6	
40.000	40.000	217.00	125.00	6	•

○ Bright ● Steam Tempered ◓ Nitrided Lands (S) S-Coated (TiN) (A) A-Coated (TiAlN) (C) C-Coated (TiCN) (F) F-Coated (FIRE)

T-SLOT CUTTERS - HSCO

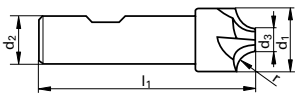
Guhring no.	3570
Standard	DIN 851
Tool material	HSCO
Surface	○
Type	N
Helix	
Tolerance	d11



d1	d2	l1	b	z	Code no.	AVAILABILITY
mm	mm	mm	mm			
12.500	10.000	57.00	6.00	6	12.500	•
16.000	10.000	62.00	8.00	6	16.000	•
18.000	12.000	70.00	8.00	6	18.000	•
19.000	12.000	71.00	9.00	6	19.000	•
21.000	12.000	74.00	9.00	8	21.000	•
22.000	12.000	75.00	10.00	8	22.000	•
25.000	16.000	82.00	11.00	8	25.000	•
28.000	16.000	85.00	12.00	8	28.000	•
32.000	16.000	90.00	14.00	8	32.000	•

CORNER ROUNDING CUTTERS WITH FACE RELIEF - HSCO

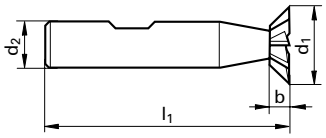
Guhring no.	3176
Standard	DIN 6518
Tool material	HSCO
Surface	○
Type	
Helix	5°
Tolerance	



d1	d2	d3	l1	z	Code no.	AVAILABILITY
mm	mm	mm	mm		rad (mm)	
10.000	10.000	6.000	60.00	4	2.000	•
11.000	10.000	6.000	60.00	4	2.500	•
12.000	12.000	6.000	60.00	4	3.000	•
14.000	12.000	6.000	60.00	4	4.000	•
16.000	12.000	6.000	60.00	4	5.000	•
20.000	16.000	8.000	67.00	4	6.000	•
24.000	16.000	8.000	71.00	4	8.000	•
28.000	25.000	6.000	85.00	4	10.000	•
34.000	25.000	6.000	90.00	4	12.000	•
41.000	25.000	6.000	100.00	6	12.500	
48.000	25.000	6.000	100.00	6	16.000	•
56.000	32.000	8.000	112.00	6	20.000	•

METRIC DOVETAIL CUTTERS - HSCO
45° DOVETAIL

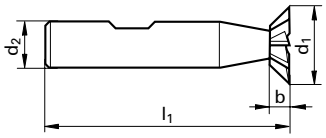
Guhring no.	3572
Standard	DIN 1833
Tool material	HSCO
Surface	○
Type	H
Profile angle	45°
Tolerance	js16



d1	d2	l1	b	z	Code no.	AVAILABILITY
mm	mm	mm	mm			
16.000	12.00	60.00	4.00	8	16.000	•
20.000	12.00	63.00	5.00	10	20.000	•
25.000	12.00	67.00	6.30	10	25.000	•
32.000	16.00	71.00	8.00	12	32.000	•

METRIC DOVETAIL CUTTERS - HSCO
60° DOVETAIL

Guhring no.	3574
Standard	DIN 1833
Tool material	HSCO
Surface	○
Type	H
Profile angle	60°
Tolerance	js16

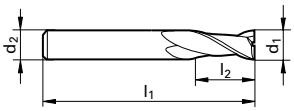


d1	d2	l1	b	z	Code no.	AVAILABILITY
mm	mm	mm	mm			
16.000	12.00	60.00	6.30	8	16.000	•
20.000	12.00	63.00	8.00	10	20.000	•
25.000	12.00	67.00	10.00	10	25.000	•
32.000	16.00	71.00	12.50	12	32.000	•

○ Bright ● Steam Tempered ◓ Nitrided Lands (S) S-Coated (TiN) (A) A-Coated (TiAlN) (C) C-Coated (TiCN) (F) F-Coated (FIRE)

2 FLUTE METRIC
STANDARD LENGTH - CARBIDE

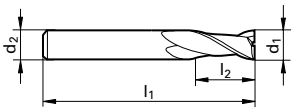
Guhring no.	3676
Standard	DIN 6528
Tool material	Solid Carbide
Surface	F
Type	N
Helix angle	30°
Tolerance	h10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
2.000	6.000	57.00	5.00	2	•
3.000	6.000	57.00	7.00	2	•
4.000	6.000	57.00	8.00	2	•
5.000	6.000	57.00	10.00	2	•
6.000	6.000	57.00	10.00	2	•
8.000	8.000	63.00	16.00	2	•
10.000	10.000	72.00	19.00	2	•
12.000	12.000	83.00	22.00	2	•
16.000	16.000	92.00	26.00	2	•
20.000	20.000	104.00	32.00	2	•

2 FLUTE METRIC
EX LONG - CARBIDE

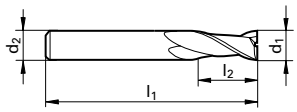
Guhring no.	5549
Standard	Guhring std.
Tool material	Solid Carbide
Surface	F
Type	N
Helix	30°
Tolerance	h10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
3.000	3.000	75.00	20.00	2	•
4.000	4.000	75.00	25.00	2	•
5.000	5.000	75.00	30.00	2	•
6.000	6.000	75.00	30.00	2	•
8.000	8.000	100.00	40.00	2	•
10.000	10.000	100.00	40.00	2	•
12.000	12.000	150.00	45.00	2	•
16.000	16.000	150.00	65.00	2	•
20.000	20.000	150.00	65.00	2	•

FOR ALUMINUM
2 FLUTE METRIC
STANDARD LENGTH - CARBIDE

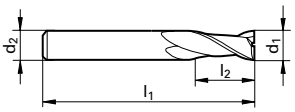
Guhring no.	5743
Standard	DIN 6527 L
Tool material	Solid Carbide
Surface	◯
Type	W
Helix angle	45º
Tolerance	e8



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
3.000	6.000	57.00	7.00	2	•
4.000	6.000	57.00	8.00	2	•
5.000	6.000	57.00	10.00	2	•
6.000	6.000	57.00	10.00	2	•
8.000	8.000	63.00	16.00	2	•
10.000	10.000	72.00	19.00	2	•
12.000	12.000	83.00	22.00	2	•
14.000	14.000	84.00	22.00	2	•
16.000	16.000	92.00	26.00	2	•
20.000	20.000	104.00	32.00	2	•

FOR ALUMINUM
2 FLUTE METRIC
EX LONG - CARBIDE

Guhring no.	3358
Standard	Guhring std.
Tool material	Solid Carbide
Surface	◯
Type	W
Helix	45º
Tolerance	h10

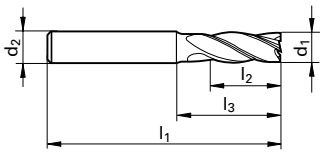


d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
5.00	5.000	75.00	30.00	2	•
6.00	6.000	75.00	30.00	2	•
8.00	8.000	100.00	40.00	2	•
10.00	10.000	100.00	40.00	2	•
12.00	12.000	150.00	45.00	2	•
16.00	16.000	150.00	65.00	2	•

◯ Bright ◯ Steam Tempered ◓ Nitrided Lands (S) S-Coated (TiN) (A) A-Coated (TiAlN) (C) C-Coated (TiCN) (F) F-Coated (FIRE)

FOR ALUMINUM
3 FLUTE METRIC
STANDARD LENGTH - CARBIDE

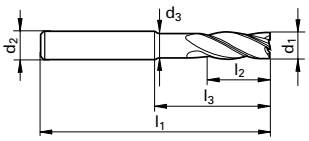
Guhring no.	3472
Standard	DIN 6527 L
Tool material	Solid Carbide
Surface	◯
Type	W
Helix angle	39° / 40° / 41°
Tolerance	h10



d1	d2	l1	l2	l3	AVAILABILITY
mm	mm	mm	mm	mm	
3.000	3.000	57.00	8.00	15.00	•
4.000	4.000	57.00	11.00	18.00	•
5.000	5.000	57.00	13.00	18.00	•
6.000	6.000	57.00	13.00	21.00	•
8.000	8.000	63.00	19.00	27.00	•
10.000	10.000	72.00	22.00	32.00	•
12.000	12.000	83.00	26.00	38.00	•
16.000	16.000	92.00	32.00	44.00	•
20.000	20.000	104.00	38.00	54.00	•

FOR ALUMINUM
3 FLUTE METRIC
EX LONG - CARBIDE

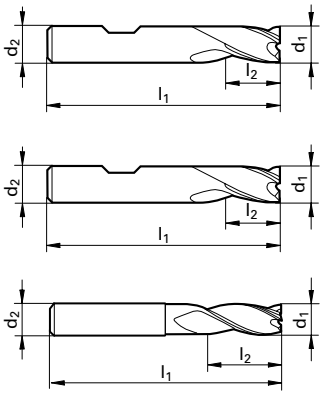
Guhring no.	3473
Standard	Guhring std.
Tool material	Solid Carbide
Surface	◯
Type	W
Helix angle	39° / 40° / 41°
Tolerance	h10



d1	d2	l1	l2	l3	AVAILABILITY
mm	mm	mm	mm	mm	
6.000	6.000	65.00	13.00	29.00	•
8.000	8.000	80.00	19.00	39.00	•
10.000	10.000	80.00	22.00	40.00	•
12.000	12.000	93.00	26.00	48.00	•
16.000	16.000	108.00	32.00	60.00	•
20.000	20.000	126.00	38.00	76.00	•

3 FLUTE METRIC
STANDARD LENGTH - CARBIDE

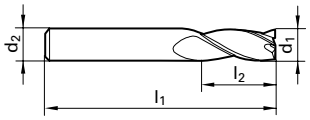
Guhring no.	5573	5574	5506
Standard	Guhring std.		DIN 6527 L
Tool material	Solid Carbide		
Surface	F		
Type	N	NH	NH
Helix angle	30°	45°	45°
Tolerance	h10	e8	e8



d1	d2	l1	l2	z	AVAILABILITY		
mm	mm	mm	mm				
0.500	3.000	38.00	1.50	3	•		
0.600	3.000	38.00	1.50	3	•		
0.800	3.000	38.00	2.00	3	•		
1.000	3.000	38.00	2.00	3		•	
1.200	3.000	38.00	2.00	3		•	
1.500	3.000	38.00	2.00	3		•	
1.800	3.000	38.00	2.00	3		•	
2.000	6.000	45.00	4.00	3		•	
2.500	6.000	45.00	5.00	3		•	
3.000	6.000	57.00	7.00	3		•	•
3.500	6.000	57.00	7.00	3		•	•
4.000	6.000	57.00	8.00	3			•
4.500	6.000	45.00	8.00	3		•	
5.000	6.000	57.00	10.00	3		•	•
5.500	6.000	45.00	8.00	3		•	
5.750	6.000	45.00	10.00	3			
6.000	6.000	57.00	10.00	3			•
7.000	8.000	63.00	13.00	3			•
8.000	8.000	63.00	16.00	3			•
8.700	10.000	55.00	14.00	3		○	
9.000	10.000	55.00	14.00	3		•	
10.000	10.000	72.00	19.00	3			•
12.000	12.000	83.00	22.00	3			•
14.000	14.000	83.00	22.00	3			•
16.000	16.000	92.00	26.00	3			•
18.000	18.000	92.00	28.00	3			•
20.000	20.000	104.00	32.00	3			•

3 FLUTE METRIC
EX LONG - CARBIDE

Guhring no.	3680
Standard	Guhring std.
Tool material	Solid Carbide
Surface	F
Type	N
Helix	30°
Tolerance	h10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
3.000	3.000	75.00	20.00	3	•
4.000	4.000	75.00	25.00	3	•
5.000	5.000	75.00	30.00	3	•
6.000	6.000	75.00	30.00	3	•
8.000	8.000	100.00	40.00	3	•
10.000	10.000	100.00	40.00	3	•
12.000	12.000	150.00	45.00	3	•
16.000	16.000	150.00	65.00	3	•
20.000	20.000	150.00	65.00	3	•

Bright · Steam Tempered · Nitrided Lands · S-Coated (TiN) · A-Coated (TiAlN) · C-Coated (TiCN) · F-Coated (FIRE)

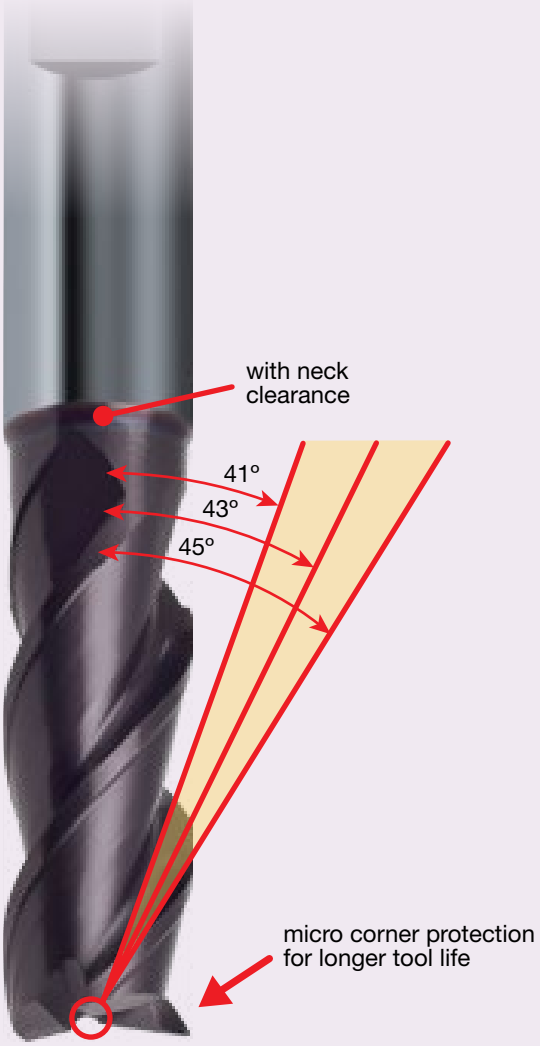
RF 100 U
HIGH-PERFORMANCE END MILLS FOR MATERIALS UP TO 1400 N/mm² (44 HRC)

RF 100 U high-perfomance end mills excel thanks to unequal helix angles which considerably reduce vibration. The uneven helix angle vastly improves surface quality for finishing operations and a considerably higher feed rate for slot drilling and roughing operations are also achieved.

With many applications. the complete milling process can be covered with one RF 100 U. which as well as increasing tool life and dimensional accuracy of the workpiece generates a considerable cost advantage.

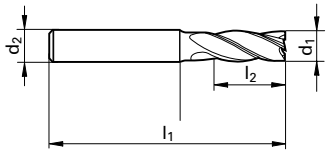
Summary of advantages

- suitable for roughing and finishing
- up to 60% higher feed rates
- up to 4-times longer tool life
- vibration-free operation
- improved workplece surface quality



RF 100 U HIGH PERFORMANCE END MILLS
3 FLUTE METRIC
STANDARD LENGTH - CARBIDE

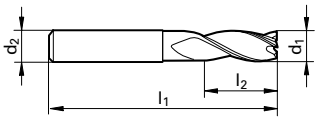
Guhring no.	3892
Standard	DIN 6527 L
Tool material	Solid Carbide
Surface	F
Type	N
Helix	41° / 43° / 45°
Tolerance	h10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
6.000	5.500	57.00	13.00	3	•
8.000	7.500	63.00	19.00	3	•
10.000	9.200	72.00	22.00	3	•
12.000	11.200	83.00	26.00	3	•
16.000	15.000	92.00	32.00	3	•
20.000	19.000	104.00	38.00	3	•

3 FLUTE IMPERIAL
STANDARD LENGTH - CARBIDE

Guhring no.	3173
Standard	Guhring std.
Tool material	Solid carbide
Surface	F
Type	NH
Helix	45°
Tolerance	h10

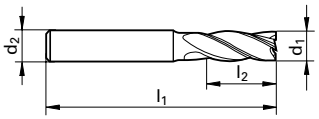


d1	d2	l1	l2	z	Code no.	AVAILABILITY
inch	inch	inch	inch		mm	
1/8	1/8	1 1/2	3/8	3	3.170	•
3/16	3/16	2	5/8	3	4.760	•
1/4	1/4	2 1/2	3/4	3	6.350	•
5/16	5/16	2 1/2	13/16	3	7.940	•
3/8	3/8	2 1/2	1	3	9.520	•
7/16	7/16	2 3/4	1	3	11.110	•
1/2	1/2	3	1	3	12.700	•
5/8	5/8	3 1/2	1 1/4	3	15.870	•
3/4	3/4	4	1 1/2	3	19.050	•
1	1	4	1 1/2	3	25.400	•

4 FLUTE IMPERIAL
STANDARD LENGTH - CARBIDE

Guhring no.	3114
Standard	Guhring std.
Tool material	Solid carbide
Surface	F
Type	N
Helix	35° / 38°
Tolerance	h10

RATIO



d1	d2	l1	l2	z	Code no.	AVAILABILITY
inch	inch	inch	inch		mm	
3/16	3/16	2	5/8	4	4.760	•
1/4	1/4	2 1/2	3/4	4	6.350	•
5/16	5/16	2 1/2	13/16	4	7.940	•
3/8	3/8	2 1/2	1	4	9.520	•
7/16	7/16	2 3/4	1	4	11.110	•
1/2	1/2	3	1	4	12.700	•
5/8	5/8	3 1/2	1 1/4	4	15.870	•
3/4	3/4	4	1 1/2	4	19.050	•
1	1	4	1 1/2	4	25.400	•

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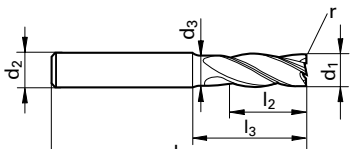
4 FLUTE METRIC ROUGHING END MILLS
STANDARD LENGTH WITH CRN RADIUS - CARBIDE

Guhring no.	3562
Standard	DIN 6527 L
Tool material	Solid carbide
Surface	F
Type	N
Helix	30°
Tolerance	h10



d1	d2	d3	l1	l2	l3	r	z	Code no.
mm	mm	mm	mm	mm	mm	mm		
6.000	6.000	5.700	57.00	13.00	21.00	1.00	4	6.010
8.000	8.000	7.700	63.00	19.00	27.00	0.50	4	8.005
8.000	8.000	7.700	63.00	19.00	27.00	1.00	4	8.010
10.000	10.000	9.500	72.00	22.00	32.00	1.00	4	10.010
10.000	10.000	9.500	72.00	22.00	32.00	2.00	4	10.020
10.000	10.000	9.500	72.00	22.00	32.00	3.00	4	10.030
12.000	12.000	11.500	83.00	26.00	38.00	1.00	4	12.010
12.000	12.000	11.500	83.00	26.00	38.00	2.00	4	12.020
12.000	12.000	11.500	83.00	26.00	38.00	3.00	4	12.030
16.000	16.000	15.500	92.00	32.00	44.00	1.00	4	16.010
16.000	16.000	15.500	92.00	32.00	44.00	1.50	4	16.015
16.000	16.000	15.500	92.00	32.00	44.00	2.00	4	16.020

AVAILABILITY

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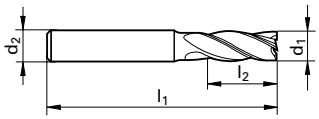
Other corner radii available on request

Bright | Steam Tempered | Nitrided Lands | S-Coated (TiN) | A-Coated (TiAlN) | C-Coated (TiCN) | F-Coated (FIRE)

4 FLUTE METRIC
STANDARD LENGTH - CARBIDE

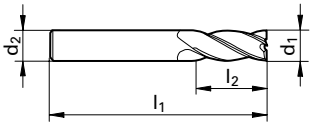
Guhring no.	5535	
	3649	5735
Standard	DIN 6527 L	
Tool material	Solid Carbide	
Surface	F	F
Type	N	N
Helix	30°	35°/38°
Tolerance	h10	h10
		RATIO



d1	d2	l1	l2	z	AVAILABILITY	
mm	mm	mm	mm			
2.000	6.000	57.00	7.00	4	•	
3.000	6.000	57.00	8.00	4	•	
4.000	6.000	57.00	11.00	4	•	•
5.000	6.000	57.00	13.00	4	•	•
6.000	6.000	57.00	13.00	4	•	•
7.000	8.000	63.00	16.00	4	•	
8.000	8.000	63.00	19.00	4	•	•
9.000	10.000	72.00	19.00	4	•	
10.000	10.000	72.00	22.00	4	•	•
12.000	12.000	83.00	26.00	4	•	•
14.000	14.000	83.00	26.00	4	•	•
16.000	16.000	92.00	32.00	4	•	•
18.000	18.000	92.00	32.00	4	•	•
20.000	20.000	104.00	38.00	4	•	•
25.000	25.000	121.00	45.00	4	•	•

4 FLUTE METRIC
EX LONG - CARBIDE

Guhring no.	5556	5582
Standard	Guhring std.	
Tool material	Solid Carbide	
Surface	F	F
Type	N	N
Helix	30°	35° / 38°
Tolerance	h10	h10
		RATIO



d1	d2	l1	l2	z	AVAILABILITY	
mm	mm	mm	mm			
3.000	3.000	75.00	20.00	4	•	
4.000	4.000	75.00	25.00	4	•	
5.000	5.000	75.00	30.00	4	•	
6.000	6.000	75.00	30.00	4	•	
8.000	8.000	100.00	40.00	4	•	
10.000	10.000	100.00	40.00	4	•	
12.000	12.000	150.00	45.00	4	•	
14.000	14.000	150.00	45.00	4	•	
16.000	16.000	150.00	65.00	4	•	
18.000	18.000	150.00	65.00	4	•	
20.000	20.000	150.00	65.00	4	•	
6.000	6.000	75.00	30.00	4		•
8.000	8.000	108.00	40.00	4		•
10.000	10.000	100.00	40.00	4		•
12.000	12.000	150.00	45.00	4		•
16.000	16.000	150.00	65.00	4		•
20.000	20.000	150.00	65.00	4		•
25.000	25.000	150.00	75.00	4		•

Bright · Steam Tempered · Nitrided Lands · S-Coated (TiN) · A-Coated (TiAlN) · C-Coated (TiCN) · F-Coated (FIRE)

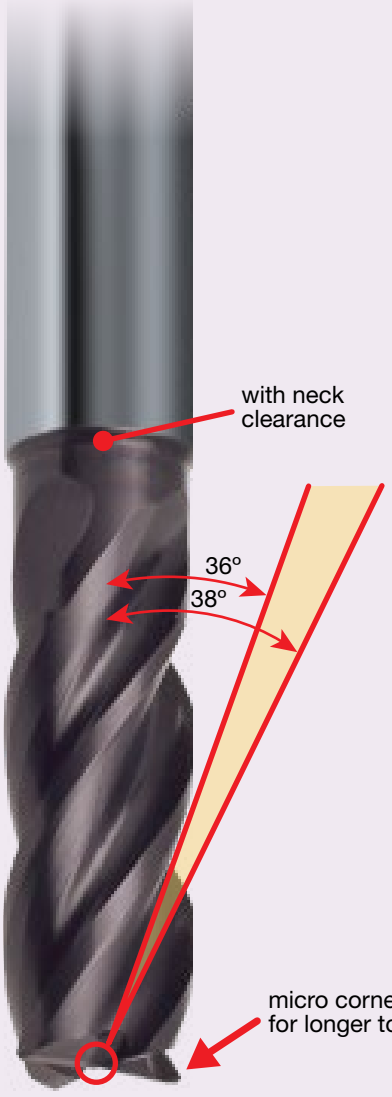
RF 100 VA HIGH-PERFORMANCE ROUGHING END MILLS FOR STAINLESS STEELS

RF 100 high-perfomance end mills excel thanks to unequal helix angles which considerably reduces vibration. The uneven helix angle vastly improves surface quality for finishing operations and a considerably higher feed rate for slot drilling and roughing operations are also achieved.

With many applications, the complete milling process can be covered with one R F 100 as well as increasing tool life and dimensional accuracy of the workpiece generates a considerable cost advantage.

Summary of advantages

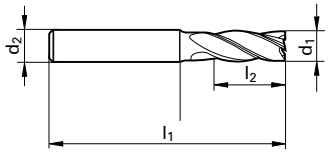
- suitable for roughing and finishing
- up to 60% higher feed rates
- up to 4-times longer tool life
- vibration-free operation
- improved workpiece surface quality



RF 100 VA HIGH PERFORMANCE ROUGHING END MILLS FOR STAINLESS STEEL

4 FLUTE METRIC STD. LENGTH - CARBIDE

Guhring no.	**3803**
Standard	**DIN 6527 L**
Tool material	**Solid Carbide**
Surface	**F**
Type	**N**
Helix	**36° / 38°**
Tolerance	**h10**



d1	d2	l1	l2	Z	AVAILABILITY
mm	mm	mm	mm		
6.000	6.000	57.00	13.00	4	•
8.000	8.000	63.00	19.00	4	•
10.000	10.000	72.00	22.00	4	•
12.000	12.000	83.00	26.00	4	•
16.000	16.000	92.00	32.00	4	•
20.000	20.000	104.00	38.00	4	•

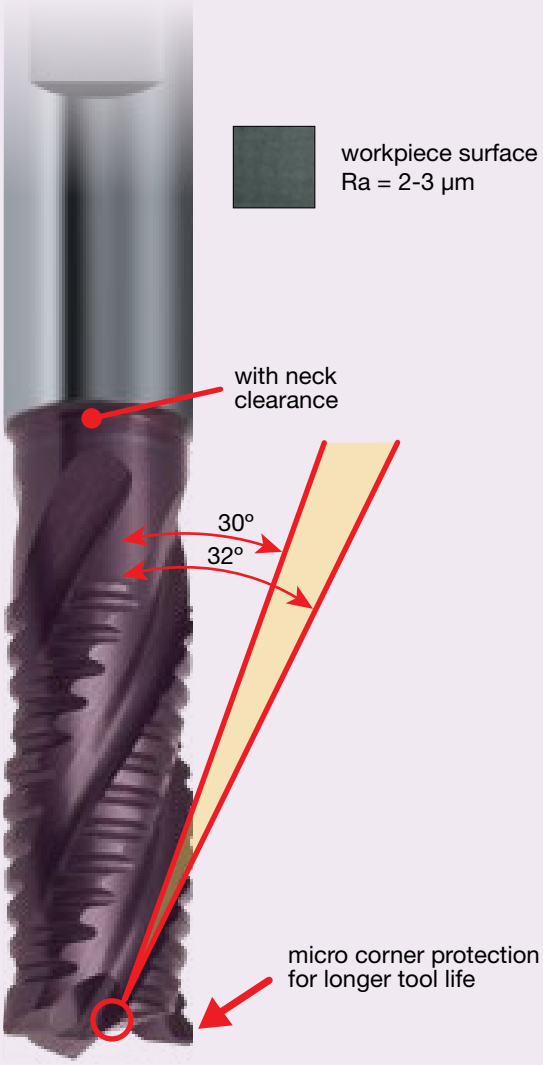
RF 100 U/HF HIGH-PERFORMANCE ROUGHING END MILLS FOR MATERIALS UP TO 1600 N/mm² (48 HRC)

Based on our RF 100 end mill with unequal helix angles in combination with a newly developed roughing geometry. The result is a dramatic increase in tool life in comparison to conventional rough milling cutters with round or flat knuckletype teeth. At the same time. the surface quality of the workpiece is improved to a peak-to-valley height of appr. Ra = 2-3 µm. making in many cases finishing operations unnecessary.

Simultaneously. the innovative design reduces power consumption in comparison to conventional RF 100 end mills allowing the application in unstable conditions and on less powerful machines.

Summary of advantages

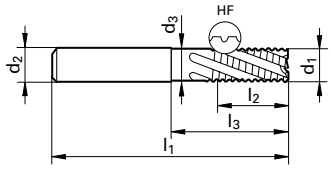
- low cutting pressure and power consumption
- vibration-free operation
- increased feed rates possible
- increased surface qualities (Ra = 2-3 µ m)
- longer tool life



RF 100 U/HF HIGH PERFORMANCE ROUGHING END MILLS

4 FLUTE METRIC STD. LENGTH RMR

Guhring no.	3508
Standard	Guhring std.
Tool material	Solid Carbide
Surface	F
Type	NF
Helix	32° / 30°
Tolerance	h10

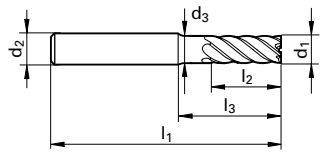


d1	d3	l1	l2	l3	Code no.	AVAILABILITY
mm	mm	mm	mm	mm		
6.000	5.500	57.00	13.00	21.00	6,000	•
8.000	7.500	63.00	19.00	27.00	8,000	•
10.000	9.200	72.00	22.00	32.00	10,000	•
12.000	11.200	83.00	26.00	38.00	12,000	•
16.000	15.000	92.00	32.00	44.00	16,000	•
20.000	19.000	104.00	38.00	54.00	20,000	•
25.000	24.000	121.00	45.00	65.00	25,000	•

Bright · Steam Tempered · Nitrided Lands · S-Coated (TiN) · A-Coated (TiAlN) · C-Coated (TiCN) · F-Coated (FIRE)

METRIC FINISHING END MILLS
5 FLUTE STANDARD LENGTH FINISH - CARBIDE

	6709	3897
Guhring no.	6709	3897
Standard	Guhring std.	Guhring std.
Tool material	Solid carbide	Solid carbide
Surface	F	F
Type	NH	NH
Helix	45°	45°
Tolerance	h10	h10

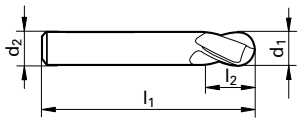


AVAILABILITY

d1	d2	d3	l1	l2	l3	Code no.		
mm	mm	mm	mm	mm	mm			
4.000	6.000	3.700	57.00	11.00	18.00	4,000	•	
5.000	6.000	4.700	57.00	13.00	18.00	5,000	•	
6.000	6.000	5.500	57.00	13.00	21.00	6,000	•	
8.000	8.000	7.500	63.00	19.00	27.00	8,000	•	
10.000	10.000	9.200	72.00	22.00	32.00	10,000	•	
12.000	12.000	11.200	83.00	26.00	38.00	12,000	•	
16.000	16.000	15.000	92.00	32.00	44.00	16,000	•	
20.000	20.000	19.000	104.00	38.00	54.00	20,000	•	
25.000	25.000	23.500	121.00	45.00	65.00	25,000	•	
4.000	6.000	3.700	65.00	12.00	23.00	4,000		•
5.000	6.000	5.700	65.00	15.00	26.00	5,000		•
6.000	6.000	5.500	65.00	18.00	29.00	6,000		•
8.000	8.000	7.500	75.00	24.00	39.00	8,000		•
10.000	10.000	9.200	80.00	30.00	40.00	10,000		•
12.000	12.000	11.200	93.00	36.00	48.00	12,000		•
16.000	16.000	15.000	108.00	48.00	60.00	16,000		•
20.000	20.000	19.000	126.00	60.00	76.00	20,000		•

2 FLUTE METRIC BALL NOSE STANDARD LENGTH - HSCO

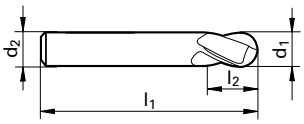
Guhring no.	3466
Standard	DIN 327 D
Tool material	M42
Surface	○
Type	N
Helix	30°
Tolerance	e8/h10



d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
4.000	6.000	51.00	7.00	2	•
6.000	6.000	52.00	8.00	2	•
8.000	10.000	61.00	11.00	2	•
10.000	10.000	63.00	13.00	2	•
12.000	12.000	73.00	16.00	2	•
16.000	16.000	79.00	19.00	2	•
20.000	20.00	88.00	22.00	2	•

2 FLUTE METRIC BALL NOSE STANDARD LENGTH - CARBIDE

Guhring no.	3679
Standard	DIN 6527 L
Tool material	Solid carbide
Surface	F
Type	N
Helix	30°
Tolerance	h10

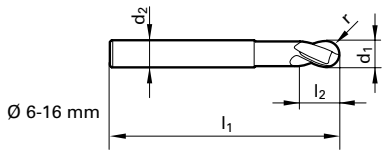


d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
0.500	3.000	38.00	1.00	2	•
0.800	3.000	38.00	1.00	2	•
1.000	3.000	38.00	2.00	2	•
1.500	3.000	38.00	3.00	2	•
2.000	6.000	57.00	6.00	2	•
3.000	6.000	57.00	7.00	2	•
4.000	6.000	57.00	8.00	2	•
5.000	6.000	57.00	10.00	2	•
6.000	6.000	57.00	10.00	2	•
8.000	8.000	63.00	16.00	2	•
10.000	10.000	72.00	19.00	2	•
12.000	12.000	83.00	22.00	2	•
14.000	14.000	83.00	22.00	2	•
16.000	16.000	92.00	26.00	2	•
18.000	18.000	92.00	26.00	2	•
20.000	20.000	104.00	32.00	2	•

○ Bright ● Steam Tempered ◓ Nitrided Lands (S) S-Coated (TiN) (A) A-Coated (TiAlN) (C) C-Coated (TiCN) (F) F-Coated (FIRE)

FOR MATERIALS <62 HRC
2 FLUTE METRIC BALL NOSE
STANDARD LENGTH - CARBIDE

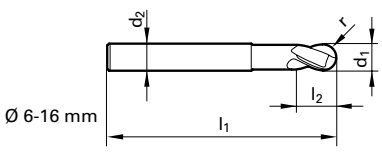
Guhring no.	3359
Standard	Guhring std.
Tool material	Solid carbide
Surface	F
Type	H
Helix	30°
Tolerance	h8



d1	d2	l1	l2	AVAILABILITY
mm	mm	mm	mm	
0.500	3.000	38.00	0.75	•
0.800	3.000	38.00	1.20	•
1.000	3.000	38.00	1.50	•
1.500	3.000	38.00	2.25	•
2.000	6.000	57.00	3.00	•
3.000	6.000	57.00	5.00	•
4.000	6.000	57.00	6.00	•
5.000	6.000	57.00	8.00	•
6.000	6.000	57.00	9.00	•
8.000	8.000	63.00	12.00	•
10.000	10.000	72.00	15.00	•
12.000	12.000	83.00	18.00	•
16.000	16.000	92.00	24.00	•

FOR MATERIALS <62 HRC
2 FLUTE METRIC BALL NOSE
EX LONG - CARBIDE

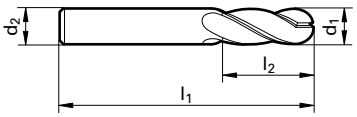
Guhring no.	3360
Standard	Guhring std.
Tool material	Solid carbide
Surface	F
Type	H
Helix	30°
Tolerance	h8



d1	d2	l1	l2	AVAILABILITY
mm	mm	mm	mm	
3.000	6.000	75.00	5.00	•
4.000	6.000	75.00	6.00	•
5.000	6.000	75.00	8.00	•
6.000	6.000	75.00	9.00	•
8.000	8.000	100.00	12.00	•
10.000	10.000	100.00	15.00	•
12.000	12.000	150.00	18.00	•
16.000	16.000	150.00	24.00	•

4 FLUTE METRIC BALL NOSE STANDARD LENGTH - CARBIDE

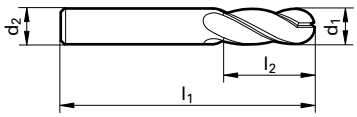
Guhring no.	3727	3050
Standard	DIN 6528	
Tool material	Solid carbide	
Surface	F	F
Type	N	N
Helix	30°	30°
Tolerance	h10	h10



d1	d2	l1	l2	z	AVAILABILITY	
mm	mm	mm	mm			
3.000	6.000	57.00	8.00	4		•
4.000	4.000	50.00	11.00	4	•	
5.000	5.000	50.00	13.00	4	•	
6.000	6.000	57.00	13.00	4	•	
8.000	8.000	63.00	19.00	4	•	
10.000	10.000	72.00	22.00	4	•	
12.000	12.000	83.00	26.00	4	•	
14.000	14.000	83.00	26.00	4	•	
16.000	16.000	92.00	32.00	4	•	
18.000	18.000	92.00	32.00	4	•	
20.000	20.000	104.00	38.00	4	•	

4 FLUTE METRIC BALL NOSE EX LONG - CARBIDE

Guhring no.	3043
Standard	Guhring std.
Tool material	Solid carbide
Surface	F
Type	N
Helix	30°
Tolerance	h10

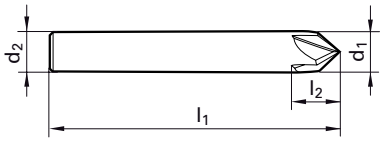


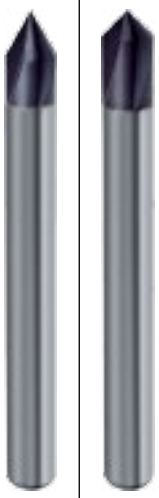
d1	d2	l1	l2	z	AVAILABILITY
mm	mm	mm	mm		
3.000	3.000	75.00	20.00	4	•
4.000	4.000	75.00	25.00	4	•
5.000	5.000	75.00	30.00	4	•
6.000	6.000	75.00	30.00	4	•
8.000	8.000	100.00	40.00	4	•
10.000	10.000	100.00	40.00	4	•
12.000	12.000	150.00	45.00	4	•

Bright · Steam Tempered · Nitrided Lands · S-Coated (TiN) · A-Coated (TiAlN) · C-Coated (TiCN) · F-Coated (FIRE)

METRIC CHAMFERING MILLING CUTTERS

Guhring no.	6711	6713
Standard	Guhring std.	
Tool material	Solid carbide	
Surface	F	
Type	N	
Angle	60°	90°
Tolerance	h7	h7



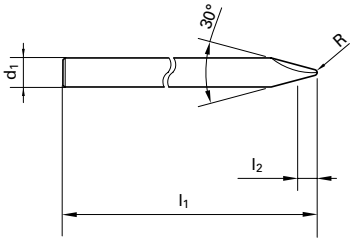


d1	d2	l1	l2	z	AVAILABILITY	
mm	mm	mm	mm	mm		
4.000	4.000	50.00	22.00	4	•	•
6.000	6.000	57.00	21.00	4	•	•
8.000	8.000	63.00	27.00	4	•	•
10.000	10.000	63.00	32.00	4	•	•
12.000	12.000	80.00	38.00	4	•	•

Also available in 120° (Part no. 6714) on request

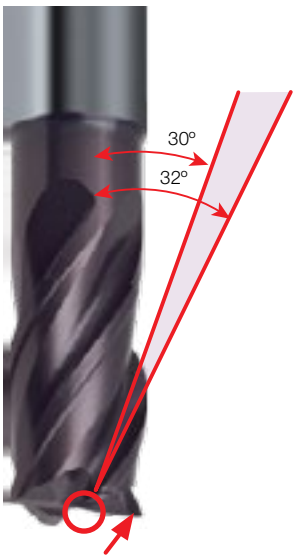
2 FLUTE ENGRAVING TOOL - CARBIDE

Guhring no.	5006
Standard	Guhring std.
Tool material	Solid carbide
Surface	C
Type	N
Angle	30°
Tolerance	h8



d1	d2	l1	l2	r	AVAILABILITY
mm	mm	mm	mm		
3.000	3.000	38.00	0.70	0.30	•

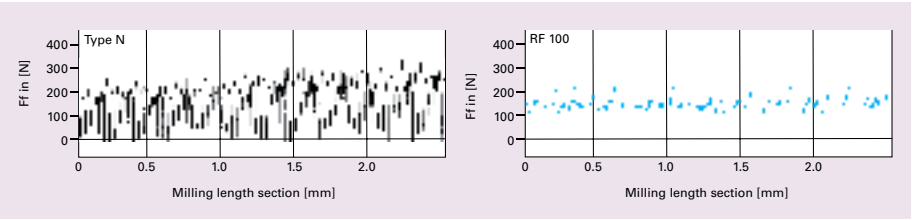
RF 100 HIGH-PERFORMANCE END MILLS
THE BEST SOLUTION FOR MATERIAL SPECIFIC MILLING



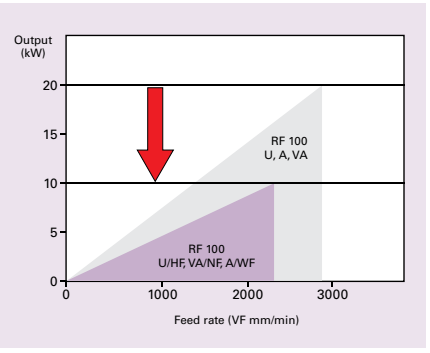
micro corner protection
for longer tool life

RF 100 high-performance end mills excel thanks to unequal helix angles which considerably reduces vibration. The unequal helix angle vastly improves surface quality for finishing operations and a considerably higher feed rates for slot drilling and roughing operations are possible.

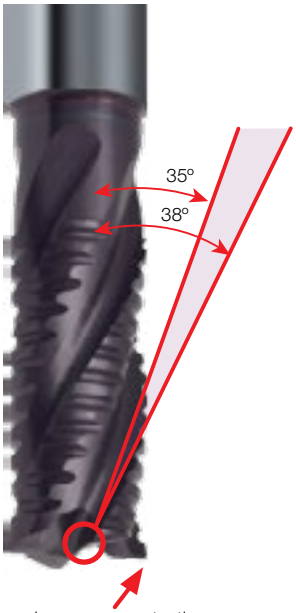
Summary of advantages:
- suitable for roughing and finishing
- up to 60% higher feed rates
- up to 4-times longer tool life
- vibration-free operation
- improved workpiece surface quality



The cutting force comparison between a conventional milling cutter type N and a RF100 clearly shows the quieter, more rigid operation of the RF100.



Type	Roughing end mill	RF 100 U/HF, VA/NF, A/WF
Performance index	100%	140%
Workpiece surface	R_a = 9-10 µm	R_a = 2-3 µm
Tool life index	100%	180%
Power consumption	100%	130%
Cutting pressure	100%	125%



micro corner protection
for longer tool life

Based on our RF 100 end mill with unequal helix angles in combination with a newly developed roughing geometry we have develloped special RF 100 roughing end mills.

The result is a drastic increase in tool life in comparison to conventional rough milling cutters with round or flat knuckle-type teeth. At the same time the surface quality of the workpiece is improved to a peak-to-valley height of appr. Ra = 2-3 µm, making in many cases finishing operations unnecessary.

At the same time, the innovative design reduces power consumption in comparison to conventional RF 100 end mills allowing the application in unstable conditions and on less powerful machines.

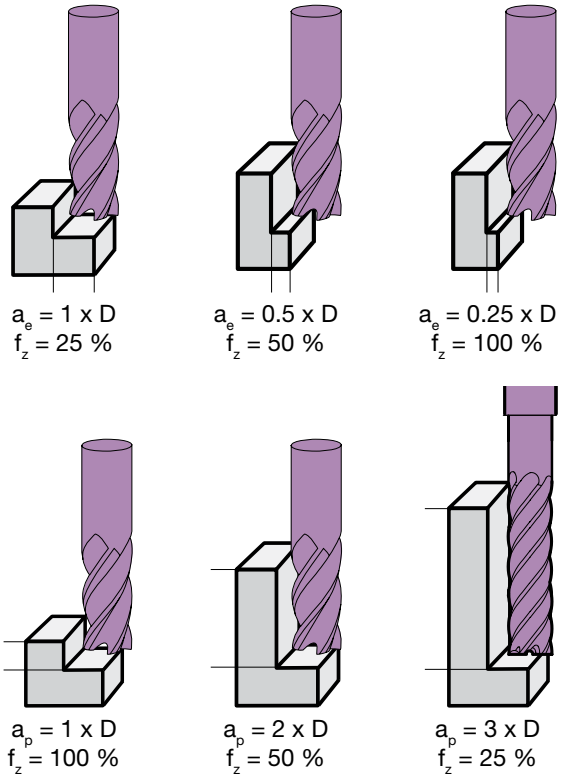
Summary of advantages:
- decreased cutting pressure and power consumption
- vibration-free operation
- higher feed rates possible
- increased surface quality (Ra = 2-3 µm)
- improved tool life
- simple chip evacuation

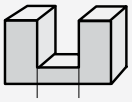
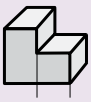
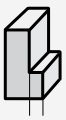
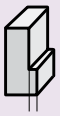
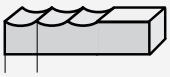
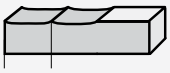
MILLING CORRECTION FACTOR INFORMATION

Feed rate adjustment:

Modifying the cutting depth and width

- when modifying the cutting depth a_p, the feed rate must be reduced in accordance with the illustration on the right
- cutting speed or revolutions remain unchanged up to cutting depths of 3 x D, must only be adapted over 3 x D
- double reduction applies when also modifying the cutting width a_e!



Application	Width of cut
Slot Milling Operations Milling of slots or keyways, ramp milling or plunging.	 1 x D
Roughing Operations Removing material in large cuts, pocket milling including ramping.	 0.5 - 1 x D
Finishing Operations Side milling with smaller cutting width but better workpiece surface quality.	 0.1 - 0.2 x D
Fine Finishing Operations Side milling with yet smaller cutting width but yet better workpiece surface quality.	 0.02 - 0.05 x D
Trace Milling Operations Tracing or 3D copying with extremely small cutting width or depth.	Radius  0.02 - 0.05 X D Torus  $\frac{D - 2xR}{2}$

PLUNGING STRATEGIES

For drilling:

- reduce feed rate vf (mm/min.)

Attention: Danger of breakage through abrupt load increase!

Oblique plunging up to 15° (preferred):

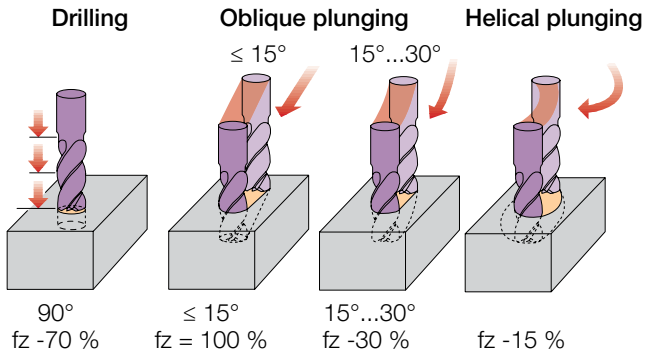
- reduction in feed rate vf (mm/min.) not required

Oblique plunging between 15° and 30°:

- reduce feed rate vf (mm/min.)

Helical plunging:

- feed 0.1 to 0.2 per cycle
- reduce feed rate vf (mm/min.)
- hole diameter 1.8 x D



CUTTING SPEED RECOMMENDATION MILLING

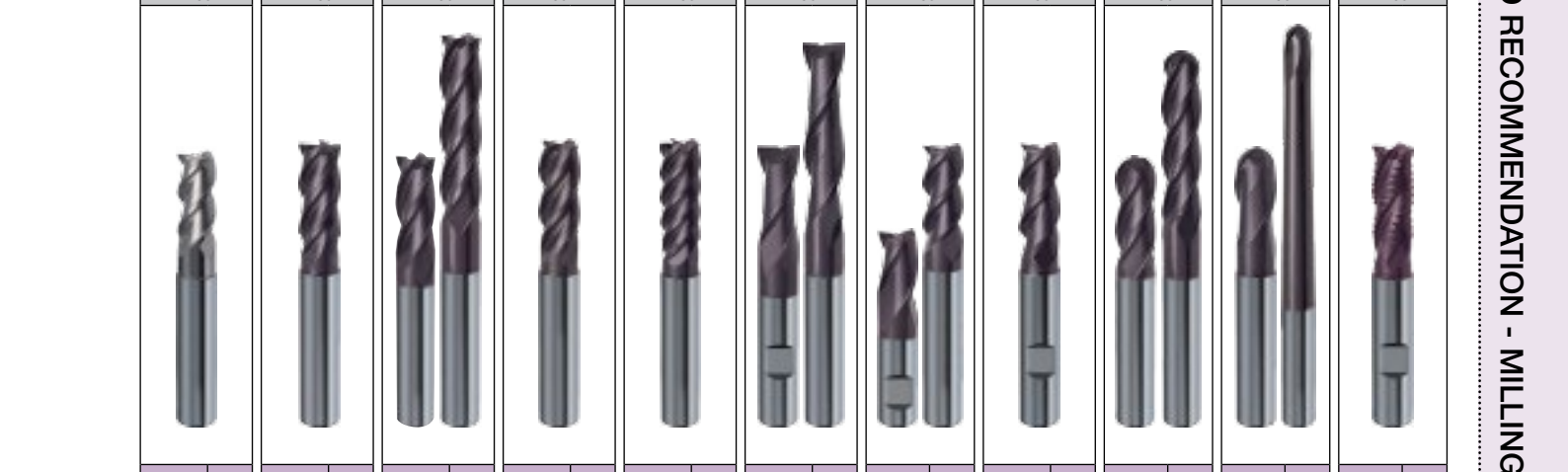
Drill ø mm	Feed Column No. 37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	f (mm/rev)															
2.00	0.001	0.001	0.001	0.002	0.002	0.004	0.005	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.018	0.020
3.00	0.002	0.002	0.003	0.003	0.004	0.007	0.010	0.010	0.010	0.015	0.016	0.013	0.019	0.022	0.024	0.030
5.00	0.005	0.006	0.007	0.009	0.010	0.014	0.020	0.020	0.022	0.025	0.026	0.026	0.028	0.030	0.032	0.038
6.00	0.006	0.008	0.009	0.011	0.013	0.017	0.024	0.025	0.027	0.031	0.029	0.033	0.039	0.036	0.041	0.047
8.00	0.010	0.012	0.014	0.016	0.019	0.024	0.032	0.032	0.035	0.042	0.042	0.047	0.053	0.052	0.058	0.064
10.00	0.013	0.015	0.018	0.021	0.025	0.030	0.038	0.039	0.044	0.050	0.053	0.059	0.065	0.066	0.073	0.080
12.00	0.010	0.018	0.022	0.026	0.030	0.036	0.046	0.048	0.052	0.059	0.063	0.072	0.079	0.085	0.090	0.100
16.00	0.020	0.023	0.027	0.032	0.038	0.045	0.054	0.058	0.063	0.071	0.079	0.088	0.095	0.100	0.110	0.120
20.00	0.023	0.028	0.033	0.038	0.045	0.057	0.066	0.073	0.080	0.090	0.097	0.100	0.110	0.120	0.130	0.140
25.00	0.030	0.035	0.040	0.045	0.055	0.065	0.075	0.100	0.120	0.130	0.140	0.150	0.165	0.170	0.180	0.190

Coolant ◍ Soluble Oil ● Oil ○ Air

Material Group	Material Examples	Tens. Strength (N/mm²)	Hardness	Coolant	M42 N 3451 3453 2 Flute DIN 844 v_c m/min	Feed col.no.	M42 N 3428 3431 4 Flute DIN 844 v_c m/min	Feed col.no.	M42 N 3459 3460 3 Flute DIN 844 v_c m/min	Feed col.no.
Common Structural Steels	Mild steel, Grade 250 plate, Grade 350 plate	≤ 500		◍	25-31	42	22-28	40	25-31	42
		> 500-850		◍	21-27	41	19-25	39	21-27	41
Free-Cutting Steels	1020, S1214, S1213, S12L13, S12L14	≤ 850		◍	21-27	41	19-25	39	21-27	41
		850-1000		◍	16-25	40	18-22	38	16-25	40
Unalloyed Heat-Treatable Steels	1035, 1045, 1055, 1060, 1025	≤ 700		◍	25-31	41	22-28	39	25-31	41
		700-850		◍	22-28	41	20-26	39	22-28	41
		850-1000		◍	19-25	40	18-22	38	19-25	40
Alloyed Heat-Treatable Steels	3140, 4130, 4140, 4150, 4340, 6150, EN16, EN26	850-1000		◍	19-25	40	18-22	38	19-25	40
		1000-1200		◍	15-19	39	13-17	37	15-19	39
Unalloyed Case Hardened Steels	1010, 1015	≤ 750		◍	25-31	41	22-28	39	25-31	41
Alloyed Case Hardened Steels	3310, 3415, 5115, 4615, 4620, 5120, 8617, 8620, N33, EN36A	850-1000		●	19-25	41	18-22	39	19-25	41
		1000-1200		●	15-19	40	13-17	38	15-19	40
Nitriding Steels	1.8504 34CrAl6, 1.8519 31CrMo V9, 1.8550 34CrAlNi7	≥ 850-1000		◍	19-25	41	18-22	39	19-25	41
		1000-1200		●	15-19	39	13-17	37	15-19	39
Tool Steels	H11, H13, P20, D2, D3	≤ 850		◍	25-31	41	22-28	39	25-31	41
		850-1000		●	9-13	39	9-11	37	9-13	39
High Speed Steels	M2, M3, M35, M45	≥ 650-1000		●	9-13	40	9-11	38	9-13	40
Spring Steels	5155, 6150, 9255		≤ 330 HB	●			9-11	37		
Stainless Steels, Sulphured	410S, 430F, 630	≤ 850		●	16-20	40	14-18	38	16-20	40
Austenitic	302, 303, 304, 310, 316, 316Ti, 321	≤ 850		●	11-15	39	10-14	37	11-15	39
Martensitic	410, 410X, 416, 420, 420C, 431, 440C	≤ 850		●	11-15	40	10-14	38	11-15	40
Hardened Steels	-		≤ 40-48 HRC	●						
			> 48-60 HRC	●						
Special Alloys	Nimonic, Inconel, Monel, Hastelloy, Bisalloy	≤ 1200		●			3-5	37		
Cast Iron	GG10, GG15, GG20, GG25, GG30, GG35, GG40		≤ 240 HB	◍○	18-22	41	16-20	39	18-22	41
			≤ 300 HB	◍○			10-14	38		
Spheroidal Graphite and Malleable Cast Iron	GGG40, GGG50, GGG60, GGG70, 32510, 50005, Nodular Iron		≤ 240 HB	◍	18-22	41	16-20	39	18-22	41
			≤ 300 HB	◍			10-14	39		
Chilled Cast Iron	-		≤ 350 HB	◍	9-13	38	9-11	36	9-13	38
Ti and Ti-alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤ 850		●	9-13	39	5-7	37	9-13	39
	3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, -TiAl8Mo 1V1	850-1200		●			125-153	36		
Al and Ti-alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤ 400		◍	138-170	44	89-109	42	138-170	44
Al Wrought Alloys	3.0615 AlMgSiPb, 3.1325 AlCiMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 450		◍	99-121	43	71-87	41	99-121	43
Al Cast Alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤ 600		◍	79-97	42	36-44	40	79-97	42
Al Cast Alloys >10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, -GAlSi12CuNiMg	≤ 600		◍	39-49	43	53-65	41	39-49	43
Magnesium Alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤ 450		○	59-73	44	49-61	42	59-73	44
Copper, Low-Alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤ 450		◍	54-68	43	49-61	41	54-68	43
Brass, Short-Chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤ 600		◍	54-68	42	31-39	40	54-68	42
Brass, Long-Chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤ 600		◍	35-43	42	31-39	40	35-43	42
Bronze, Short-Chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤ 600		◍●	35-43	42	31-39	40	35-43	42
	2.0790 CuNi18Zn19Pb	> 600 -850		●	29-37	41	27-33	39	29-37	41
Bronze, Long-Chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850		●	29-37	41	27-33	39	29-37	41
	2.0980 CuAl11Ni, 2.1247 CuBe2	850-1000		●	15-19	40	13-17	38	15-19	40
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren		-	○						
Thermoplastics	Plexiglas, Hostalen,Novodur, Makralon		-	◍○						

○ Bright ◍ Steam Tempered ◓ Nitrided Lands (S) S-Coated (TiN) (A) A-Coated (TiAlN) (C) C-Coated (TiCN) (F) F-Coated (FIRE)

Carbide	Carbide	Carbide	Carbide	Carbide	Carbide	Carbide	Carbide	Carbide	Carbide	Carbide
○	F	F	F	F	F	F	F	F	F	F
W	Ratio	N	N	NH	N	NH	N	N	N	NRf
3472	5735	3649	3803	6709	3676	5506	3892	3043	3359	3508
3473	5582	5556		3897	5549	5574		3727	3360	
5743	3808					5680			3679	
2 Flute	4 Flute	4 Flute	4 Flute	5 Flute	2 Flute	3 Flute	4 Flute	2-4 Flute	2 Flute	4 Flute
DIN 6527	DIN 6527	DIN 6527	DIN 6527 L	DIN 6527	DIN 6527	DIN 6527	DIN 6527L	DIN 6527	DIN 6527	DIN 6527



v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
		170-208	48	110-136	43			171-209	48	85-105	42	94-116	43	200	48	97-119	49	97-119	49	97-119	49
		157-193	47	102-126	42			157-193	47	81-99	41	89-109	42	200	47	90-110	48	90-110	48	90-110	48
		170-208	47	110-136	42			171-209	47	85-105	41	94-116	42	180	47	97-119	48	97-119	48	97-119	48
		126-154	46	81-101	41			126-154	46	63-77	42	69-85	43	180	46	72-88	47	72-88	47	72-88	47
		170-208	47	110-136	42			171-209	47	85-105	41	94-116	42	180	47	97-119	48	97-119	48	97-119	48
		151-185	47	98-120	42			153-187	47	76-94	41	84-104	42	180	47	86-106	48	86-106	48	86-106	48
		126-154	46	81-101	41			126-154	46	63-77	42	69-85	43	180	46	72-88	47	72-88	47	72-88	47
		151-185	46	98-120	41			153-187	46	76-94	42	84-104	43	160	46	86-106	47	86-106	47	86-106	47
		126-154	45	81-101	40			126-154	45	63-77	42	69-85	43	160	45	72-88	46	72-88	46	72-88	46
		189-231	47	123-151	42			189-231	47	98-110	41	99-121	42	180	47	108-132	48	108-132	48	108-132	48
		151-185	47	98-120	42			153-187	47	76-94	41	84-104	42	160	47	86-106	48	86-106	48	86-106	48
		113-139	46	73-91	41			117-143	46	54-66	42	59-73	43	160	46	64-80	47	64-80	47	64-80	47
		170-208	47	110-136	42			171-209	47	85-105	41	94-116	42	180	47	97-119	48	97-119	48	97-119	48
		151-185	45	98-120	40			153-187	45	76-94	40	84-104	41	160	45	86-106	46	86-106	46	86-106	46
		151-185	47	98-120	42			153-187	47	76-94	41	84-104	42	160	47	86-106	48	86-106	48	86-106	48
		126-154	45	81-101	40			126-154	45	63-77	40	69-85	41	110	45	72-88	46	72-88	46	72-88	46
		94-116	46	61-75	41			94-116	46	45-55	42	49-61	43	110	46					54-66	47
		94-116	45					94-116	45	45-55	40	49-61	41	110	45						
		94-116	46			140	47	94-116	46	45-55	42	49-61	43	140	46	54-66	47	54-66	47	54-66	47
		81-101	45			120	47	81-99	45	40-50	40	45-55	41	120	45	46-58	46	46-58	46	46-58	46
		75-93	46			100	45	76-94	46	36-44	41	39-49	42	100	46	43-53	47	43-53	47	43-53	47
		44-54	43					49-61	43	45-55	40	49-61	41	70	43	25-31	44	25-31	44	25-31	44
																18-22	41	18-22	41	18-22	41
		56-70	45					54-66	45	27-33	40	29-37	41	35	45	32-40	46	32-40	46	32-40	46
		220-270	47	143-175	42			220-270	47	108-132	41	118-146	42	180	47	126-154	48	126-154	48	126-154	48
		201-247	46	131-161	41			202-248	46	99-121	40	108-134	41	160	46	115-141	47	115-141	47	115-141	47
		184-224	47	118-146	42			180-220	47	90-110	41	99-121	42	180	47	104-128	48	104-128	48	104-128	48
		157-193	46	102-126	41			157-193	46	81-99	40	89-109	41	160	46	90-110	47	90-110	47	90-110	47
		107-131	44	69-85						54-66	40	59-73	41	110	44						
		94-116	45	61-75	40			94-116	45	45-55	40	49-61	41	90	45	54-66	46	54-66	46	54-66	46
		75-93	44	49-61	39			76-94	44	36-44	40	39-49	41	90	44	43-53	45	43-53	45	43-53	45
297-363	46	319-1001	50	532-652	45			810-990	50	405-495	43	445-545	44	300-1000	50						
360-440	46	1008-1232	49	655-801	44			720-880	50	495-605	43	544-666	44	1000-1200	49						
144-176	45	403-493	48	261-321	43			405-495	48	198-242	42	217-267	43	450	48						
117-143	46	315-385	49	205-251	44			324-396	49	162-198	43	178-218	44	350	49						
171-209	47	466-570	50	303-371	45			450-550	50	225-275	44	247-303	45	500	50						
81-99	46	214-262	49	139-171	44			216-264	49	108-132	43	117-146	44	300	49						
72-88	46	201-247	48	131-161	43			198-242	48	90-110	43	99-121	44	250	48						
67-83	45	163-201	48	106-130	43			153-187	48	81-99	42	89-109	43	250	48						
72-88	46	201-247	48	131-161				198-242	48	90-110	42	99-121	43	250	48						
63-77	45	151-185	47	98-120				153-187	47	72-88	41	79-97	42	250	47						
63-77	45	151-185	47					153-187	47	72-88	42	79-97	43	200	47						
54-66	43	126-154	46					126-154	46	63-77	40	69-85	41	200	46						
81-99	43	214-262	46					216-264	46	108-132	40	118-146	41	200	46						
72-88	43	201-247	46					198-242	46	99-121	40	108-134	41	200	46						

○ Bright Steam Tempered Nitrided Lands S S-Coated (TiN) A A-Coated (TiAlN) C C-Coated (TiCN) F F-Coated (FIRE)