

GUHRING



RF 100 5-Speed and 7-Speed

GUHRING – YOUR WORLDWIDE PARTNER

5 RF 100 SPEED

WITH EXTENSIVE
CORNER RADIUS OFFERING

large, wide flutes for
outstanding chip evacuation

stable cutting edge
with corner radius and
face correction =
Double Protection
for long tool life

38° helix angle with unequal
flute spacing for smooth cut and
low-vibration machining



nano-A™ wear-
resistant coating for
extended tool life

Dished center for efficient ramping and helical milling

NEW

Highest metal removal rates with outstanding process reliability

The RF100 5-Speed combines the versatility of a 4-flute tool with the feed rate benefits of a 5-flute tool. Unequal flute spacing ensures smooth and quiet cutting, while the dished center allows ramp angles exceeding 10 degrees. The RF100 5-Speed excels with outstanding material removal rates, long tool life, and exceptional process reliability in difficult to machine materials.

-
- // high-performance roughing even at high cutting depths
 - // maximum feed rates for large metal removal rates
 - // highly dynamic milling in tough stainless steels, special alloys and a wide variety of steel and cast iron grades

Highly dynamic GTC machining at an a_e of up to 10 %

At limited machine speeds or cutting speeds limited by the material, the RF 100 5 and 7 Speed ensure high feed rates and long tool life thanks to the increased number of teeth. They are particularly suitable for difficult-to-machine materials under stable conditions.



RF 100 5 Speed

Applicable in all tough materials up to 34HRc.
Ramping up to 10°, slotting with cutting depths up to 1 x D, helical milling.

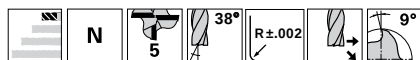




RF 100 5 Speed - Short length, corner radii

Series

6985



Tool material

Solid Carbide

Coating

nano-A™

nano-A™

Type

N

N

Shank

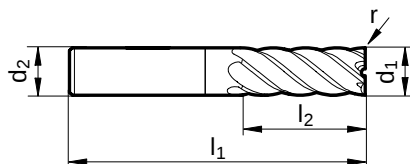
HA

HB

Internal cooling

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

• without center cutting



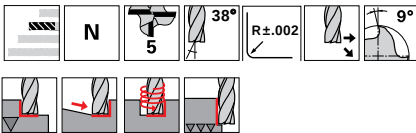
d1 h10	d2 h6	l1	l2	r	No. of flutes	Code no.	EDP Number	EDP Number
inch	inch	inch	inch	inch				
1/4	1/4	2	3/8	0.02	5	6.352	9069850063520	
1/4	1/4	2	3/8	0.03	5	6.354	9069850063540	
1/4	1/4	2	3/8	0.06	5	6.356	9069850063560	
5/16	5/16	2	7/16	0.02	5	7.942	9069850079420	
5/16	5/16	2	7/16	0.03	5	7.944	9069850079440	
5/16	5/16	2	7/16	0.06	5	7.946	9069850079460	
3/8	3/8	2 1/2	1/2	0.02	5	9.522		9069850095220
3/8	3/8	2 1/2	1/2	0.03	5	9.524		9069850095240
3/8	3/8	2 1/2	1/2	0.06	5	9.526		9069850095260
3/8	3/8	2 1/2	1/2	0.09	5	9.527		9069850095270
1/2	1/2	2 1/2	5/8	0.03	5	12.704		9069850127040
1/2	1/2	2 1/2	5/8	0.06	5	12.706		9069850127060
1/2	1/2	2 1/2	5/8	0.09	5	12.707		9069850127070
1/2	1/2	2 1/2	5/8	0.12	5	12.709		9069850127090
5/8	5/8	3	3/4	0.03	5	15.874		9069850158740
5/8	5/8	3	3/4	0.06	5	15.876		9069850158760
5/8	5/8	3	3/4	0.09	5	15.877		9069850158770
5/8	5/8	3	3/4	0.12	5	15.879		9069850158790
3/4	3/4	3 1/2	1	0.03	5	19.054		9069850190540
3/4	3/4	3 1/2	1	0.06	5	19.056		9069850190560
3/4	3/4	3 1/2	1	0.09	5	19.057		9069850190570
3/4	3/4	3 1/2	1	0.12	5	19.059		9069850190590
3/4	3/4	3 1/2	1	0.19	5	19.050		9069850190500
1	1	4	1 1/4	0.03	5	25.404		9069850254040
1	1	4	1 1/4	0.06	5	25.406		9069850254060
1	1	4	1 1/4	0.09	5	25.407		9069850254070
1	1	4	1 1/4	0.12	5	25.409		9069850254090
1	1	4	1 1/4	0.19	5	25.400		9069850254000
1	1	4	1 1/4	0.25	5	25.401		9069850254010



RF 100 5 Speed - Standard length, corner radii

Series

6986



Tool material

Solid Carbide

Coating

nano-A™

nano-A™

Type

N

N

Shank

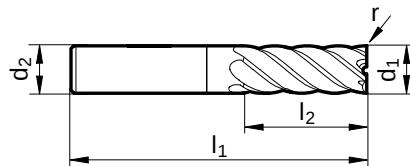


Internal cooling



Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

• without center cutting



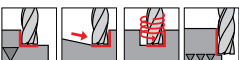
d1 h10	d2 h6	l1	l2	r	No. of flutes	Code no.	EDP Number	EDP Number
inch	inch	inch	inch	inch				
1/4	1/4	2 1/2	1/2	0.02	5	6.352	9069860063520	
1/4	1/4	2 1/2	1/2	0.03	5	6.354	9069860063540	
1/4	1/4	2 1/2	1/2	0.06	5	6.356	9069860063560	
5/16	5/16	2 1/2	13/16	0.02	5	7.942	9069860079420	
5/16	5/16	2 1/2	13/16	0.03	5	7.944	9069860079440	
5/16	5/16	2 1/2	13/16	0.06	5	7.946	9069860079460	
3/8	3/8	3	1	0.02	5	9.522		9069860095220
3/8	3/8	3	1	0.03	5	9.524		9069860095240
3/8	3/8	3	1	0.06	5	9.526		9069860095260
3/8	3/8	3	1	0.09	5	9.527		9069860095270
1/2	1/2	3	1	0.03	5	12.704		9069860127040
1/2	1/2	3	1	0.06	5	12.706		9069860127060
1/2	1/2	3	1	0.09	5	12.707		9069860127070
1/2	1/2	3	1	0.12	5	12.709		9069860127090
5/8	5/8	3 1/2	1 1/4	0.03	5	15.874		9069860158740
5/8	5/8	3 1/2	1 1/4	0.06	5	15.876		9069860158760
5/8	5/8	3 1/2	1 1/4	0.09	5	15.877		9069860158770
5/8	5/8	3 1/2	1 1/4	0.12	5	15.879		9069860158790
3/4	3/4	4	1 5/8	0.03	5	19.054		9069860190540
3/4	3/4	4	1 5/8	0.06	5	19.056		9069860190560
3/4	3/4	4	1 5/8	0.09	5	19.057		9069860190570
3/4	3/4	4	1 5/8	0.12	5	19.059		9069860190590
3/4	3/4	4	1 5/8	0.19	5	19.050		9069860190500
1	1	4 1/2	2	0.03	5	25.404		9069860254040
1	1	4 1/2	2	0.06	5	25.406		9069860254060
1	1	4 1/2	2	0.09	5	25.407		9069860254070
1	1	4 1/2	2	0.12	5	25.409		9069860254090
1	1	4 1/2	2	0.19	5	25.400		9069860254000
1	1	4 1/2	2	0.25	5	25.401		9069860254010



RF 100 5 Speed - Long length, corner radii

Series

6987



Tool material

Solid Carbide

Coating

nano-A™

nano-A™

Type

N

N

Shank

HA

HB

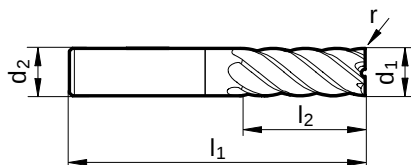
Internal cooling

X

X

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

• without center cutting



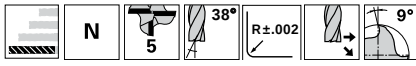
d1 h10	d2 h6	l1	l2	r	No. of flutes	Code no.	EDP Number	EDP Number
inch	inch	inch	inch	inch				
1/4	1/4	2 1/2	3/4	0.02	5	6.352	9069870063520	
1/4	1/4	2 1/2	3/4	0.03	5	6.354	9069870063540	
1/4	1/4	2 1/2	3/4	0.06	5	6.356	9069870063560	
5/16	5/16	3	1	0.02	5	7.942	9069870079420	
5/16	5/16	3	1	0.03	5	7.944	9069870079440	
5/16	5/16	3	1	0.06	5	7.946	9069870079460	
3/8	3/8	3	1 1/4	0.02	5	9.522		9069870095220
3/8	3/8	3	1 1/4	0.03	5	9.524		9069870095240
3/8	3/8	3	1 1/4	0.06	5	9.526		9069870095260
3/8	3/8	3	1 1/4	0.09	5	9.527		9069870095270
1/2	1/2	3 1/2	1 1/4	0.03	5	12.704		9069870127040
1/2	1/2	3 1/2	1 1/4	0.06	5	12.706		9069870127060
1/2	1/2	3 1/2	1 1/4	0.09	5	12.707		9069870127070
1/2	1/2	3 1/2	1 1/4	0.12	5	12.709		9069870127090
5/8	5/8	3 3/4	1 5/8	0.03	5	15.874		9069870158740
5/8	5/8	3 3/4	1 5/8	0.06	5	15.876		9069870158760
5/8	5/8	3 3/4	1 5/8	0.09	5	15.877		9069870158770
5/8	5/8	3 3/4	1 5/8	0.12	5	15.879		9069870158790
3/4	3/4	5	2 1/4	0.19	5	19.050		9069870190500
3/4	3/4	5	2 1/4	0.03	5	19.054		9069870190540
3/4	3/4	5	2 1/4	0.06	5	19.056		9069870190560
3/4	3/4	5	2 1/4	0.09	5	19.057		9069870190570
3/4	3/4	5	2 1/4	0.12	5	19.059		9069870190590
1	1	5	2 1/2	0.03	5	25.404		9069870254040
1	1	5	2 1/2	0.06	5	25.406		9069870254060
1	1	5	2 1/2	0.09	5	25.407		9069870254070
1	1	5	2 1/2	0.12	5	25.409		9069870254090
1	1	5	2 1/2	0.19	5	25.400		9069870254000
1	1	5	2 1/2	0.25	5	25.401		9069870254010



RF 100 5 Speed - XL length, corner radii

Series

6988



Tool material

Solid Carbide

Coating

nano-A™

nano-A™

Type

N

N

Shank

HA

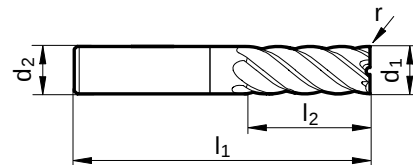
HB

Internal cooling



Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

• without center cutting



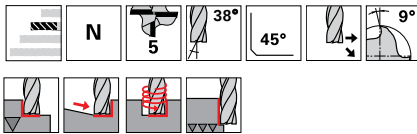
d1 h10	d2 h6	l1	l2	r	No. of flutes	Code no.	EDP Number	EDP Number
inch	inch	inch	inch	inch				
1/4	1/4	3	1	0.02	5	6.352	9069880063520	
1/4	1/4	3	1	0.03	5	6.354	9069880063540	
1/4	1/4	3	1	0.06	5	6.356	9069880063560	
3/8	3/8	3 1/2	1 1/2	0.02	5	9.522		9069880095220
3/8	3/8	3 1/2	1 1/2	0.03	5	9.524		9069880095240
3/8	3/8	3 1/2	1 1/2	0.06	5	9.526		9069880095260
3/8	3/8	3 1/2	1 1/2	0.09	5	9.527		9069880095270
1/2	1/2	4	1 5/8	0.03	5	12.704		9069880127040
1/2	1/2	4	1 5/8	0.06	5	12.706		9069880127060
1/2	1/2	4	1 5/8	0.09	5	12.707		9069880127070
1/2	1/2	4	1 5/8	0.12	5	12.709		9069880127090
5/8	5/8	4 1/8	2 1/8	0.03	5	15.874		9069880158740
5/8	5/8	4 1/8	2 1/8	0.06	5	15.876		9069880158760
5/8	5/8	4 1/8	2 1/8	0.09	5	15.877		9069880158770
5/8	5/8	4 1/8	2 1/8	0.12	5	15.879		9069880158790
3/4	3/4	5	2 5/8	0.03	5	19.054		9069880190540
3/4	3/4	5	2 5/8	0.06	5	19.056		9069880190560
3/4	3/4	5	2 5/8	0.09	5	19.057		9069880190570
3/4	3/4	5	2 5/8	0.12	5	19.059		9069880190590
3/4	3/4	5	2 5/8	0.19	5	19.050		9069880190500
1	1	6	3 1/4	0.03	5	25.404		9069880254040
1	1	6	3 1/4	0.06	5	25.406		9069880254060
1	1	6	3 1/4	0.09	5	25.407		9069880254070
1	1	6	3 1/4	0.12	5	25.409		9069880254090
1	1	6	3 1/4	0.19	5	25.400		9069880254000
1	1	6	3 1/4	0.25	5	25.401		9069880254010



RF 100 5 Speed - Standard length, corner chamfer

Series

6990



Tool material

Solid Carbide

Coating

nano-A™

nano-A™

Type

N

N

Shank

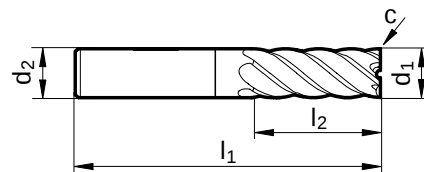
HA

HB

Internal cooling

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

- with chipbreakers
- without center cutting



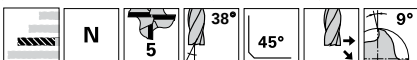
d1 h10	d2 h6	l1	l2	c	No. of flutes	Code no.	EDP Number	EDP Number
inch	inch	inch	inch	inch				
1/4	0.2500	2 1/2	3/4	0.005	5	6.350	9069900063500	
5/16	0.3125	2 1/2	13/16	0.006	5	7.940	9069900079400	
3/8	0.3750	2 3/4	1	0.008	5	9.520		9069900095200
1/2	0.5000	3 1/2	1 1/4	0.010	5	12.700		9069900127000
5/8	0.6250	3 1/2	1 1/4	0.013	5	15.870		9069900158700
3/4	0.7500	4	1 1/2	0.015	5	19.050		9069900190500
1	1.0000	4 1/2	2	0.017	5	25.400		9069900254000



RF 100 5 Speed - Long length, corner chamfer

Series

6991



Tool material

Solid Carbide

Coating

nano-A™

nano-A™

Type

N

N

Shank



Internal cooling

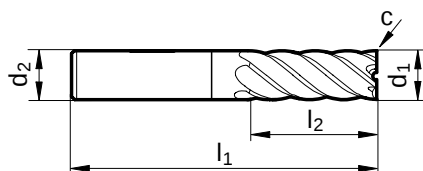


NEW

NEW

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

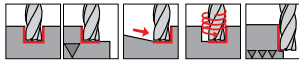
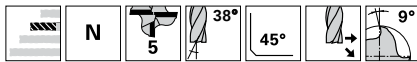
- with chipbreakers
- without center cutting



d1 h10	d2 h6	l1	l2	c	No. of flutes	Code no.	EDP Number	EDP Number
inch	inch	inch	inch	inch				
1/4	0.2500	2 3/4	1	0.005	5	6.350	9069910063500	
5/16	0.3125	3	1 1/4	0.006	5	7.940	9069910079400	
3/8	0.3750	3 1/4	1 1/2	0.008	5	9.520		9069910095200
1/2	0.5000	4 1/4	2	0.010	5	12.700		9069910127000
5/8	0.6250	4 1/2	2 1/4	0.013	5	15.870		9069910158700
3/4	0.7500	5	2 1/2	0.015	5	19.050		9069910190500
1	1.0000	5 1/2	3	0.017	5	25.400		9069910254000

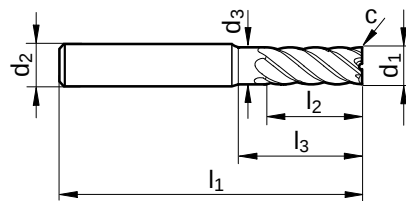


RF 100 5 Speed metric, standard length, corner chamfer



Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

- with chip breaker
- neck clearance
- without center cutting



d1 h10	d2 h6	d3	l1	l2	l3	c	No. of flutes	Code no.	EDP Number	
mm	mm	mm	mm	mm	mm	mm x 45°				
6.00	6.00	5.70	57.00	13.00	20.00	0.12	5	6.000	9068560060000	9068570060000
8.00	8.00	7.70	63.00	19.00	26.00	0.16	5	8.000	9068560080000	9068570080000
10.00	10.00	9.50	72.00	22.00	30.00	0.20	5	10.000	9068560100000	9068570100000
12.00	12.00	11.50	83.00	26.00	36.00	0.24	5	12.000	9068560120000	9068570120000
16.00	16.00	15.50	92.00	32.00	42.00	0.32	5	16.000	9068560160000	9068570160000
20.00	20.00	19.50	104.00	38.00	52.00	0.40	5	20.000	9068560200000	9068570200000

Series

6856

6857

Tool material

Solid Carbide

Coating

SuperA™

SuperA™

Type

N

N

Shank

HA

HB

Internal cooling

X

X

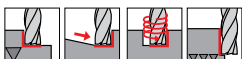
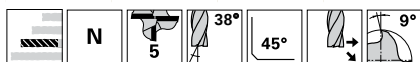
NEW

NEW



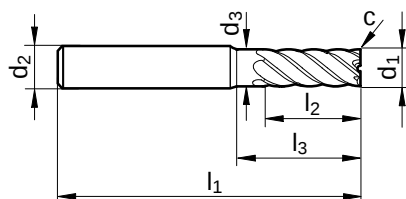


RF 100 5-Speed metric, long length, corner chamfer



Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

- with chip breaker
- neck clearance
- without center cutting



Series

6858

6859

Tool material

Solid Carbide

Coating

SuperA™

SuperA™

Type

N

N

Shank



Internal cooling



NEW

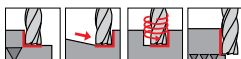
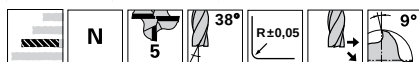
NEW



d1 h10	d2 h6	l1	l2	l3	c	No. of flutes	Code no.	EDP Number	
mm	mm	mm	mm	mm	mm x 45°				
6.00	6.00	65.00	20.00	28.00	0.12	5	6.000	9068580060000	9068590060000
8.00	8.00	75.00	26.00	38.00	0.16	5	8.000	9068580080000	9068590080000
10.00	10.00	90.00	32.00	38.00	0.20	5	10.000	9068580100000	9068590100000
12.00	12.00	100.00	40.00	46.00	0.24	5	12.000	9068580120000	9068590120000
16.00	16.00	108.00	50.00	58.00	0.32	5	16.000	9068580160000	9068590160000
20.00	20.00	126.00	62.00	74.00	0.40	5	20.000	9068580200000	9068590200000

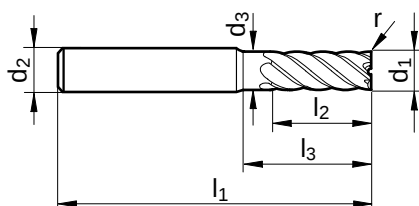


RF 100 5 Speed metric, long length, corner radii



Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

- with chip breaker
- neck clearance
- without center cutting



Series

6860

6861

Tool material

Solid Carbide

Coating

SuperA™

SuperA™

Type

N

N

Shank



Internal cooling



NEW

NEW



d1 h10	d2 h6	d3	l1	l2	l3	r	No. of flutes	Code no.	EDP Number	
mm	mm	mm	mm	mm	mm	mm				
6.00	6.00	5.70	65.00	20.00	28.00	0.20	5	6.002	9068600060020	9068610060020
6.00	6.00	5.70	65.00	20.00	28.00	0.50	5	6.005	9068600060050	9068610060050
6.00	6.00	5.70	65.00	20.00	28.00	1.00	5	6.010	9068600060100	9068610060100
8.00	8.00	7.70	75.00	26.00	38.00	0.30	5	8.003	9068600080030	9068610080030
8.00	8.00	7.70	75.00	26.00	38.00	0.50	5	8.005	9068600080050	9068610080050
8.00	8.00	7.70	75.00	26.00	38.00	1.00	5	8.010	9068600080100	9068610080100
8.00	8.00	7.70	75.00	26.00	38.00	1.50	5	8.015	9068600080150	9068610080150
10.00	10.00	9.50	80.00	32.00	38.00	0.50	5	10.005	9068600100050	9068610100050
10.00	10.00	9.50	80.00	32.00	38.00	1.00	5	10.010	9068600100100	9068610100100
10.00	10.00	9.50	80.00	32.00	38.00	1.50	5	10.015	9068600100150	9068610100150
10.00	10.00	9.50	80.00	32.00	38.00	2.00	5	10.020	9068600100200	9068610100200
12.00	12.00	11.50	93.00	40.00	46.00	0.50	5	12.005	9068600120050	9068610120050
12.00	12.00	11.50	93.00	40.00	46.00	1.00	5	12.010	9068600120100	9068610120100
12.00	12.00	11.50	93.00	40.00	46.00	1.50	5	12.015	9068600120150	9068610120150
12.00	12.00	11.50	93.00	40.00	46.00	2.00	5	12.020	9068600120200	9068610120200
16.00	16.00	15.50	108.00	50.00	58.00	0.50	5	16.005	9068600160050	9068610160050
16.00	16.00	15.50	108.00	50.00	58.00	1.00	5	16.010	9068600160100	9068610160100
16.00	16.00	15.50	108.00	50.00	58.00	1.50	5	16.015	9068600160150	9068610160150
16.00	16.00	15.50	108.00	50.00	58.00	2.00	5	16.020	9068600160200	9068610160200
16.00	16.00	15.50	108.00	50.00	58.00	3.00	5	16.030	9068600160300	9068610160300
20.00	20.00	19.50	126.00	62.00	74.00	1.00	5	20.010	9068600200100	9068610200100
20.00	20.00	19.50	126.00	62.00	74.00	1.50	5	20.015	9068600200150	9068610200150
20.00	20.00	19.50	126.00	62.00	74.00	2.00	5	20.020	9068600200200	9068610200200
20.00	20.00	19.50	126.00	62.00	74.00	3.00	5	20.030	9068600200300	9068610200300



imachining

RF 100 Speed in application

RF 100 Speed series 6774 3/4" on machine component

Application:

HPC roughing; dry machining
in 4140 (28 HRC) steel
in HPC clamping chuck with PinLock collet for pull-out prevention

Cutting parameters:

DOC (a_p): 2.36	WOC (a_e): up to .040
SFM: 885	RPM: 4300
IPT: .0083	IPM: up to 146

Metal removal rate $Q = 13.8 \text{ in}^3/\text{min}$

Tool life 278 minutes for roughing operations!

RF 100 7 SPEED



specialized face geometry allows for helical milling with 5% step down per revolution

32° helix angle with unequal flute spacing for reduced contact points and low-vibration machining

Chip breaker allows for better chip evacuation and lower cutting forces

stable cutting edge corner thanks to corner protection chamfer and face correction






 RF 100 7 Speed

Applicable in all tough materials up to 1200 N/mm².
Helical milling up to 0.05 x D a_p infeeds per cycle.

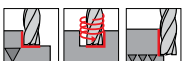
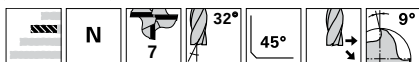




RF 100 7 Speed - Standard length, corner chamfer

Series

6997



Tool material

Solid Carbide

Coating

nano-A™

nano-A™

Type

N

N

Shank

HA

HB

Internal cooling



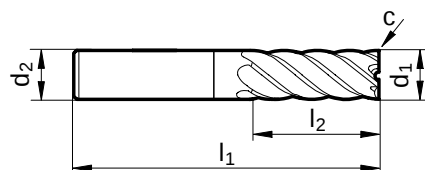
NEW

NEW

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

• with chipbreakers

• without center cutting



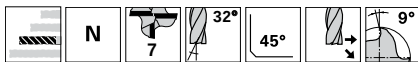
d1 h10	d2 h6	l1	l2	c	No. of flutes	Code no.	EDP Number	EDP Number
inch	inch	inch	inch	inch				
1/4	1/4	2 1/2	3/4	0.005	7	6.350	9069970063500	
5/16	5/16	2 1/2	13/16	0.006	7	7.940	9069970079400	
3/8	3/8	2 3/4	1	0.008	7	9.520		9069970095200
1/2	1/2	3 1/2	1 1/4	0.010	7	12.700		9069970127000
5/8	5/8	3 1/2	1 1/4	0.013	7	15.870		9069970158700
3/4	3/4	4	1 1/2	0.015	7	19.050		9069970190500
1	1	4 1/2	2	0.017	7	25.400		9069970254000



RF 100 7 Speed - Long length, corner chamfer

Series

6998



Tool material

Solid Carbide

Coating

nano-A™

nano-A™

Type

N

N

Shank



Internal cooling

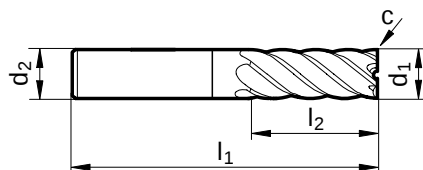


NEW

NEW

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

- with chipbreakers
- without center cutting



d1 h10	d2 h6	l1	l2	c	No. of flutes	Code no.	EDP Number	EDP Number
inch	inch	inch	inch	inch				
1/4	1/4	2 3/4	1	0.005	7	6.350	9069980063500	
5/16	5/16	3	1 1/4	0.006	7	7.940	9069980079400	
3/8	3/8	3 1/4	1 1/2	0.008	7	9.520		9069980095200
1/2	1/2	4 1/4	2	0.010	7	12.700		9069980127000
5/8	5/8	4 1/2	2 1/4	0.013	7	15.870		9069980158700
3/4	3/4	5	2 1/2	0.015	7	19.050		9069980190500
1	1	5 1/2	3	0.017	7	25.400		9069980254000

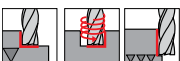


RF 100 7 Speed metric, Long length, corner chamfer

Series

6864

6865



Tool material

Solid Carbide

Coating

SuperA™

SuperA™

Type

N

N

Shank

HA

HB

Internal cooling

X

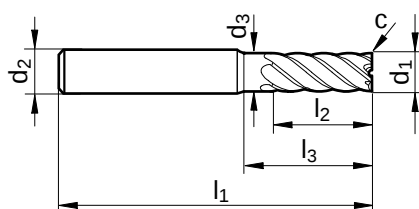
X

NEW

NEW

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	
	Composites	
●=Optimal ○=Secondary		

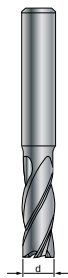
- with chip breaker
- neck clearance
- without center cutting



d1 h10	d2 h6	d3	l1	l2	l3	c	No. of flutes	Code no.	EDP Number	
mm	mm	mm	mm	mm	mm	mm				
6.00	6.00	5.70	65.00	20.00	28.00	0.12	7	6.000	9068640060000	9068650060000
8.00	8.00	7.70	75.00	26.00	38.00	0.16	7	8.000	9068640080000	9068650080000
10.00	10.00	9.50	80.00	32.00	38.00	0.20	7	10.000	9068640100000	9068650100000
12.00	12.00	11.50	93.00	40.00	46.00	0.24	7	12.000	9068640120000	9068650120000
16.00	16.00	15.50	108.00	50.00	58.00	0.32	7	16.000	9068640160000	9068650160000
20.00	20.00	19.50	126.00	62.00	74.00	0.40	7	20.000	9068640200000	9068650200000

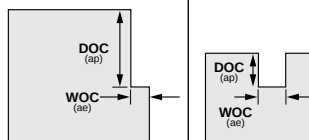


FEEDS & SPEEDS FOR RF100 Speed



For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Surface feet per minute - SFM



High Speed Milling

Rough Slot

DOC 2xd

DOC 1xd

WOC .05xd

WOC .1xd

WOC .25xd

WOC .4 to .9xd

WOC 1xd

$$\text{RPM} = \frac{\text{SFM}}{d_1} \times 3.82$$

$$\text{IPM} = \text{No. of teeth} \times \text{IPT} \times \text{RPM}$$

Feed Rate Inch per Tooth - IPT

d1 End Mill Diameter

1/8 3.17mm	1/4 6.35mm	5/16 7.94mm	3/8 9.52mm	1/2 12.70mm	5/8 15.87mm	3/4 19.05mm	1 25.40mm
---------------	---------------	----------------	---------------	----------------	----------------	----------------	--------------

← Multiply IPT x this factor based on WOC

Material	Hardness	2.5	2.3	1.5	1	1
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels A283, 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx	up to 28 HRc	1200	1100	900	650	575
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx, 11xx	28 to 38 HRc	1100	1000	850	650	525
Alloyed heat-treatable, tool and high speed steels 13xx, 2340, 31xx, 32xx, 33xx, 34xx, 40xx, 41xx, 43xx, 4640, 50xx, 51xx, 61xx, 71xx, 86xx, 87xx, 92xx, 98xx, 98xx, Ax, Ox, Dx, Hxx, Lx, Wx, Mx, Tx	28 to 44 HRc	900	800	680	650	425
Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	Up to 54 HRc	480	460	360	250	225
	54 to 60 HRc	250				
Stainless steel 303, 410, 420F, 430, 430F, 416	Up to 28 HRc	840	760	450	450	400
Stainless steel 304, 304L, 420, 17-4PH, 17-7PH, 15-5PH, 13-8PH	up tp 28 HRc	525	475	330	330	250
Stainless steel 310, 316, 316B, 316L, 317, Duplex	over 28 HRc	420	380	260	260	200
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	up to 42 HRc	420	380	260	260	200
High-Temperature Alloys Inconel, Nimonic, Monel, Hastelloy, Waspalloy, A286, Rene 41, Udimet, Stellite	up to 42 HRc	210	190	130	130	100
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	1100	1000	850	620	525
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	over 240 HB 30	950	860	720	550	450
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	3400	3090	2600	1950	1625
Aluminum-cast alloys 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISI9, 3.2581 G-AISI12, 3.2583 G-AISI12Cu, -G-AISI12CuNiMg	over 3% Si	1575	1425	1200	1000	750
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	—	1210	1100	920	725	575
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	1680	1520	1280	975	800



Efficient milling with the correct strategies

Principles and objectives

Maximum tool utilization

- utilization of entire cutting edge length
- full power delivery
- increased tool life
- balanced wear

Modification of cutting distribution

- low cutting widths a_e
- high cutting depths a_p

High process reliability

- low tool wrapping
- improved thermal conditions at tool cutting edge
- low mechanical stress

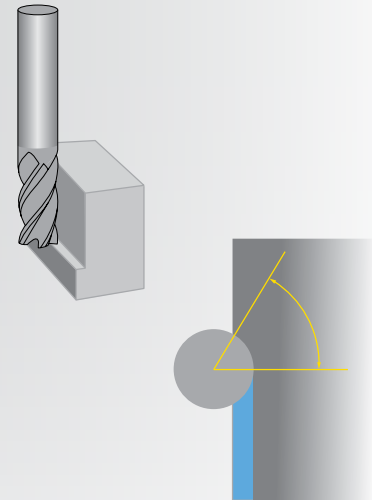
Maximum metal removal rate

- saving time/machine costs



Application Parameters

Small cutting width up to $0.33 \times D$	→ Low radial engagement $< 70^\circ$ → Cutting edge spends less time in contact with workpiece
Very high feed rate	→ Reduced chip thickness results in a significantly higher feed rate
Very high cutting speed	→ Reduced heating and prolonged cooling allow for very high speeds
High cutting depth	→ Improved leverage → High removal rates → Increased contact points of the tool



*Angle of engagement &
Tool contact time*

Metal removal rate

The formula below calculates cubic Inches of material removed per minute. This calculation is important in determining the efficiency of your milling strategy.

$$\text{DOC}_{(a_p)} \times \text{WOC}_{(a_e)} \times \text{Feed rate}_{(\text{inch}/\text{min})} = \text{In}^3/\text{Min}$$



Influence on process through tool engagement

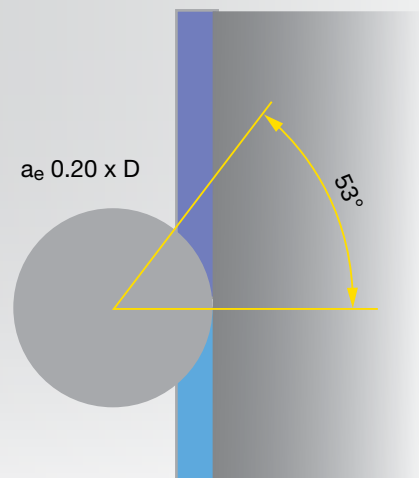
Engagement angle

The engagement angle is important in determining the load acting on the tool. Engagement remains constant in straight milling paths, increases in concave paths, and decreases in convex paths.

Straight milling path

- constant angle of engagement
- constant tool load

Example: $a_e 0.20 \times D = 53^\circ$ engagement
Engagement remains a constant 53°

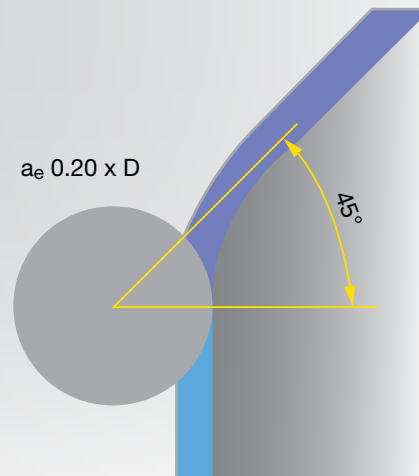


Convex milling path

- Engagement decreases as tool enters radius
- Tool load decreases

Example: $a_e 0.20 \times D = 53^\circ$ engagement
Engagement is reduced to 45°

Result: a_e may be increased
 f_z can be increased

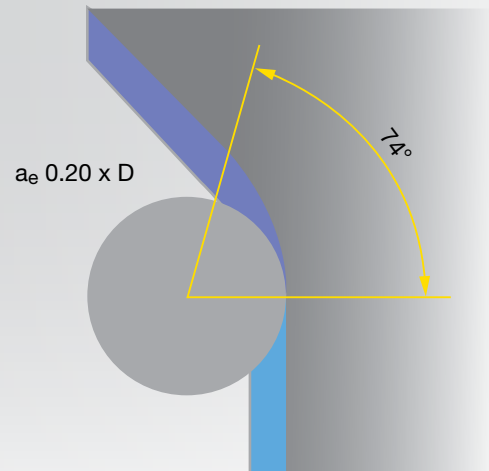


Concave milling path

- Engagement increases as tool enters radius
- Tool load increasing

Example: $a_e 0.20 \times D = 53^\circ$ engagement
Engagement is increased to 74°

Result: a_e must be reduced
 f_z must be reduced in radius





Influence on process through tool engagement

Engagement angle at 90° corner radii

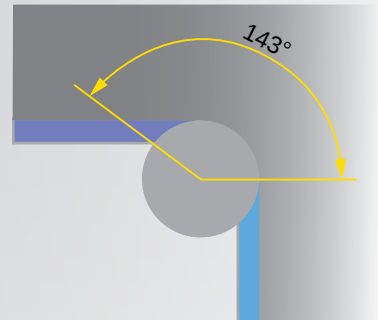
Tool radius = Corner radius

- Very unfavorable for tool dynamics
- Abrupt increase in tool load
- Catastrophic failure of cutting tool likely

Example: Engagement angle increases 270% from 53° to 143°

Measures: v_c and f_z must be heavily reduced

$$a_e 0.20 \times D$$



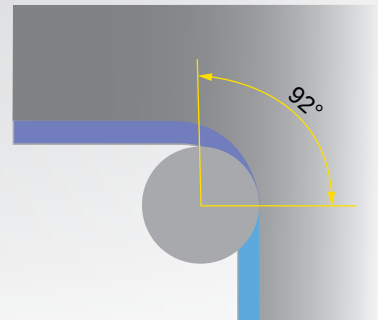
Tool radius < Corner radius

- Corner created by interpolating path
- Increase in tool load is less abrupt
- Smaller increase in tool load

Example: Engagement angle increases 174% from 53° to 92°

Measures: a_e must be reduced
 f_z must be heavily reduced in radius

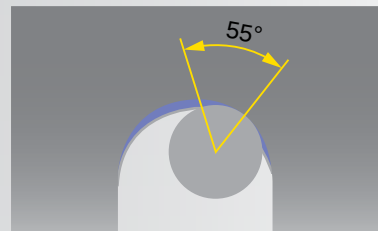
$$a_e 0.20 \times D$$



Ratio of slot width to tool diameter during trochoidal milling

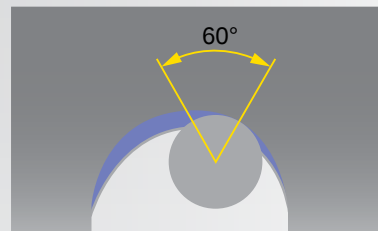
Groove width 1.7 – 2.0 x D

- C-shaped tool path
- a_e max. $0.10 \times D$ (theoretical 37°)
- Engagement angle increases by up to 50% (55° engagement)



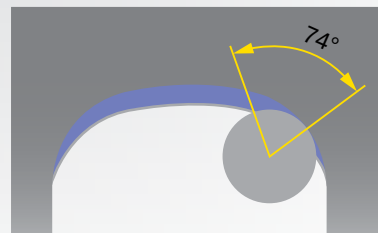
Groove width 2.1 – 3.0 x D

- C-shaped tool path
- a_e max. $0.15 \times D$ (theoretical 46°)
- Engagement angle increases by up to 30% (60° engagement)



Groove width from 3.1 x D

- D-shaped tool path
- a_e max. $0.20 \times D$ (theoretical 53°)
- Engagement angle increases by up to 40% (74° engagement)



GUHRING RECONDITIONING



in-house grinding
and coating services

www.guhring.com/Reconditioning



Guhring HPC power clamp chucks

Well clamped is well milled!

Summary of advantages

- extreme clamping force thanks to mechanical clamping transmission
- ideal combination with HPC end mills and thread milling cutters
- for immense speeds with HPC and HSC milling
- maximum rigidity

GÜHROJET

Thanks to the securing pin in the PinLock clamping sleeve, tool pull-out is prevented when applied with standard milling tools utilizing HB shanks to DIN 6535 specifications. The combination of the HPC clamping technology, high concentricity, and the Guhrojet peripheral cooling feature allows us to achieve the perfect balance of high metal removal rates, longer tool life and improved surface finish.

PINLOCK





Guhring, Inc. Main Office

1445 Commerce Avenue
 Brookfield, WI 53045
 Tel (262) 784-6730 (800) 776-6170
 Fax (262) 784-9096

Michigan Manufacturing and Reconditioning Facility

24975 Trans-X Road
 Novi, MI 48375

Guhring Corp. (Canada)

20 Steckle Place, Unit #14
 Kitchener, ON N2E 2C3
 Tel (519) 748-9664 (800) 463-5555
 Fax (519) 748-2954

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