



# DIVER

# AKWO GUHRING

## Extended program and coolant through end mills



Diver end mill  
冷水孔立铣刀

株洲奥凯沃硬质合金工具有限公司  
Zhuzhou AoKai Wo Carbide Tool Co.Ltd

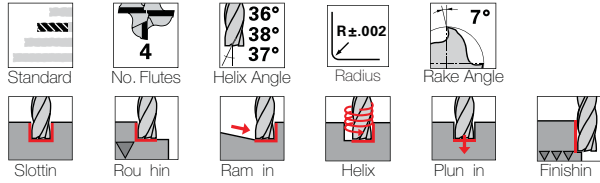
为您的应用选择最佳的冷水孔立铣刀

Choose the optimal Diver end mill for your application



# RF 100 DIVER (4-flute) - Inch - Standard Length

center cutting - with corner radius options



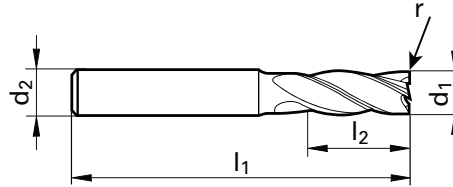
Tool material

Solid Carbide

Surface finish

Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	—

●=Optimal ○=Secondary



d1 h10	d2 h6	l1	l2	corner	No. of Flutes	Code no.	EDP Number
inch	inch	inch	inch	radius			
1/8	1/8	1 1/2	1/4	0.015	4	3.172	9067590031720
1/8	1/8	1 1/2	1/4	0.031	4	3.174	9067590031740
3/16	3/16	2	3/8	0.015	4	4.762	9067590047620
3/16	3/16	2	3/8	0.031	4	4.764	9067590047640
1/4	1/4	2 1/2	1/2	0.015	4	6.352	9067590063520
1/4	1/4	2 1/2	1/2	0.031	4	6.354	9067590063540
1/4	1/4	2 1/2	1/2	0.062	4	6.356	9067590063560
5/16	5/16	2 1/2	3/4	0.015	4	7.942	9067590079420
5/16	5/16	2 1/2	3/4	0.031	4	7.944	9067590079440
5/16	5/16	2 1/2	3/4	0.062	4	7.946	9067590079460
3/8	3/8	2 1/2	7/8	0.015	4	9.522	9067590095220
3/8	3/8	2 1/2	7/8	0.031	4	9.524	9067590095240
3/8	3/8	2 1/2	7/8	0.062	4	9.526	9067590095260
3/8	3/8	2 1/2	7/8	0.090	4	9.527	9067590095270
1/2	1/2	3 1/2	1	0.015	4	12.702	9067590127020
1/2	1/2	3 1/2	1	0.031	4	12.704	9067590127040
1/2	1/2	3 1/2	1	0.062	4	12.706	9067590127060
1/2	1/2	3 1/2	1	0.090	4	12.707	9067590127070
1/2	1/2	3 1/2	1	0.125	4	12.709	9067590127090
5/8	5/8	3 1/2	1 1/4	0.031	4	15.874	9067590158740
5/8	5/8	3 1/2	1 1/4	0.062	4	15.876	9067590158760
5/8	5/8	3 1/2	1 1/4	0.090	4	15.877	9067590158770
5/8	5/8	3 1/2	1 1/4	0.125	4	15.879	9067590158790
3/4	3/4	4	1 1/2	0.031	4	19.054	9067590190540
3/4	3/4	4	1 1/2	0.062	4	19.056	9067590190560
3/4	3/4	4	1 1/2	0.090	4	19.057	9067590190570
3/4	3/4	4	1 1/2	0.125	4	19.059	9067590190590
3/4	3/4	4	1 1/2	0.190	4	19.050	9067590190500
3/4	3/4	4	1 1/2	0.250	4	19.051	9067590190510
1	1	5	1 1/2	0.031	4	25.404	9067590254040
1	1	5	1 1/2	0.062	4	25.406	9067590254060
1	1	5	1 1/2	0.090	4	25.407	9067590254070
1	1	5	1 1/2	0.125	4	25.409	9067590254090
1	1	5	1 1/2	0.190	4	25.400	9067590254000
1	1	5	1 1/2	0.250	4	25.401	9067590254010

# High Feed HF 300 (4-Flute) - Metric - Standard Length



Standard



No. Flutes



Helix Angle



Rake Angle



Roughing



Ramping



Helix



Copy Milling



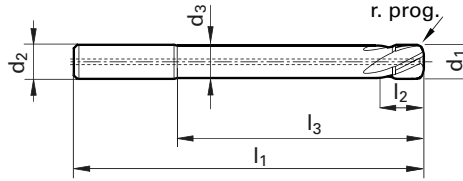
Solid Carbide

Tool material

Surface finish

Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	—
S	Ni / Ti alloys	○
H	Hardened steel	●

●=Optimal    ○=Secondary



1 h10	d2 h6	d3	l1	l2	l3	r	No. of Flutes	Code no.	EDP Number
mm	mm	mm	mm	mm	mm	mm x 45°			
3.000	6.000	2.800	57.00	2.00	15.00	0.50	4	3.000	9067710030000
4.000	6.000	3.800	57.00	3.00	18.00	0.80	4	4.000	9067710040000
5.000	6.000	4.800	57.00	4.00	20.00	0.80	4	5.000	9067710050000
6.000	6.000	5.700	57.00	5.00	21.00	1.00	4	6.000	9067710060000
8.000	8.000	7.700	63.00	6.00	27.00	1.50	4	8.000	9067710080000
10.000	10.000	9.500	72.00	8.00	32.00	2.00	4	10.000	9067710100000
12.000	12.000	11.500	83.00	10.00	38.00	2.00	4	12.000	9067710120000
16.000	16.000	15.500	92.00	12.00	44.00	2.50	4	16.000	9067710160000

# High Feed HF 300 (4-Flute) - Metric - XL Long Length



XL Long



No. Flutes



Helix Angle



Rake Angle



Roughing



Ramping



Helix



Copy Milling



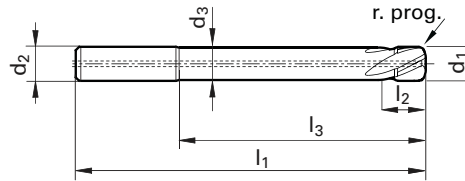
Solid Carbide

Tool material

Surface finish

Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	—
S	Ni / Ti alloys	○
H	Hardened steel	●

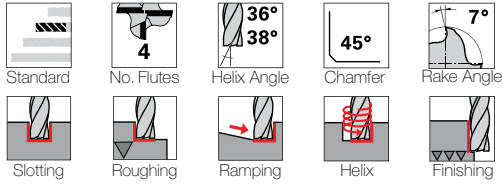
●=Optimal    ○=Secondary



d1 h10	d2 h6	d3	l1	l2	l3	r	No. of Flutes	Code no.	EDP Number
mm	mm	mm	mm	mm	mm	mm x 45°			
3.000	6.000	2.800	80.00	2.00	30.00	0.50	4	3.000	9067720030000
4.000	6.000	3.800	80.00	3.00	32.00	0.80	4	4.000	9067720040000
5.000	6.000	4.800	80.00	4.00	40.00	0.80	4	5.000	9067720050000
6.000	6.000	5.700	80.00	5.00	44.00	1.00	4	6.000	9067720060000
8.000	8.000	7.700	100.00	6.00	64.00	1.50	4	8.000	9067720080000
10.000	10.000	9.500	120.00	8.00	75.00	2.00	4	10.000	9067720100000
12.000	12.000	11.500	120.00	10.00	75.00	2.00	4	12.000	9067720120000
16.000	16.000	15.500	150.00	12.00	100.00	2.50	4	16.000	9067720160000

# RF 100 VA (4-flute) - Metric - Standard Length - Coolant Through

## center cutting

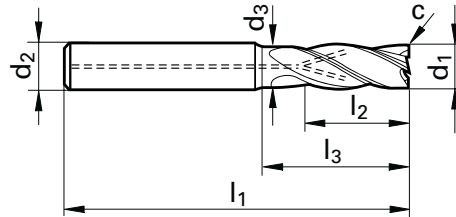


Tool material  
Surface finish

**Solid Carbide**

Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	●
K	Cast iron	○
N	Aluminum	—
S	Ni / Ti alloys	●
H	Hardened steel	—

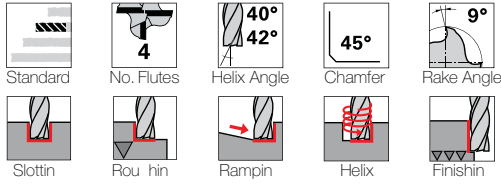
●=Optimal    ○=Secondary



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°				
6.000	6.000	5.700	57.00	13.00	20.00	0.20	4	6.000	9067000060000	9067010060000
8.000	8.000	7.700	63.00	19.00	26.00	0.25	4	8.000	9067000080000	9067010080000
10.000	10.000	9.500	72.00	22.00	30.00	0.30	4	10.000	9067000100000	9067010100000
12.000	12.000	11.500	83.00	26.00	36.00	0.35	4	12.000	9067000120000	9067010120000
16.000	16.000	15.500	92.00	32.00	42.00	0.50	4	16.000	9067000160000	9067010160000
20.000	20.000	19.500	104.00	38.00	52.00	0.60	4	20.000	9067000200000	9067010200000
25.000	25.000	24.000	121.00	45.00	63.00	0.75	4	25.000	9067000250000	9067010250000

# RF 100 F (4-flute) - Metric - Standard Length - Coolant Through

## center cutting

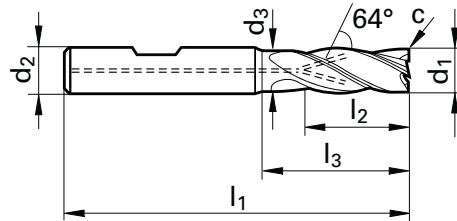


Tool material  
Surface finish

**Solid Carbide**

Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	●
K	Cast iron	○
N	Aluminum	—
S	Ni / Ti alloys	●
H	Hardened steel	—

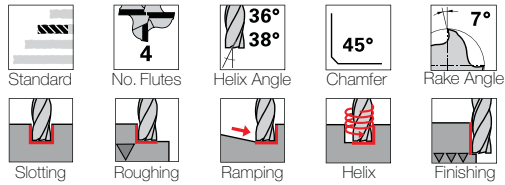
●=Optimal    ○=Secondary



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°			
6.000	6.000	5.700	57.00	13.00	20.00	0.15	4	6.000	9033660060000
8.000	8.000	7.700	63.00	19.00	26.00	0.15	4	8.000	9033660080000
10.000	10.000	9.500	72.00	22.00	30.00	0.20	4	10.000	9033660100000
12.000	12.000	11.500	83.00	26.00	36.00	0.20	4	12.000	9033660120000
16.000	16.000	15.500	92.00	32.00	42.00	0.35	4	16.000	9033660160000
20.000	20.000	19.500	104.00	38.00	52.00	0.45	4	20.000	9033660200000

# RF 100 VA (4-flute) - Metric - Standard Length - Coolant Through

## center cutting



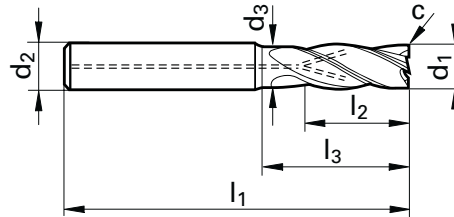
Tool material

Surface finish

**Solid Carbide**

Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	●
K	Cast iron	○
N	Aluminum	—
S	Ni / Ti alloys	●
H	Hardened steel	—

●=Optimal    ○=Secondary



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°				
6.000	6.000	5.700	57.00	13.00	20.00	0.20	4	6.000	9067000060000	9067010060000
8.000	8.000	7.700	63.00	19.00	26.00	0.25	4	8.000	9067000080000	9067010080000
10.000	10.000	9.500	72.00	22.00	30.00	0.30	4	10.000	9067000100000	9067010100000
12.000	12.000	11.500	83.00	26.00	36.00	0.35	4	12.000	9067000120000	9067010120000
16.000	16.000	15.500	92.00	32.00	42.00	0.50	4	16.000	9067000160000	9067010160000
20.000	20.000	19.500	104.00	38.00	52.00	0.60	4	20.000	9067000200000	9067010200000
25.000	25.000	24.000	121.00	45.00	63.00	0.75	4	25.000	9067000250000	9067010250000

# ROUGH-TECH 48 GS100 U (4-Flute) - Metric - Std. Length with Coolant

## center cutting



Standard



No. Flutes



Helix Angle



Chamfer



Rake Angle



Slotting



Roughing



Ramping



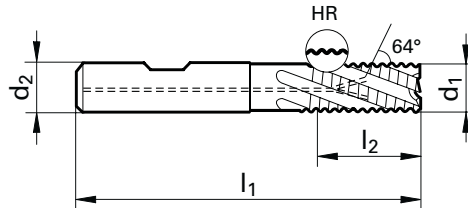
Helix

Tool material

Surface finish

Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	—
S	Ni / Ti alloys	●
H	Hardened steel	—

●=Optimal ○=Secondary



d1 h10	d2 h6	l1	l2	l3	c	No. of Flutes	Code no.	EDP Number
mm	mm	mm	mm	mm	mm x 45°			
6.000	6.000	57.00	13.00	21.00	0.30	4	6.000	9033650060000
8.000	8.000	63.00	19.00	27.00	0.30	4	8.000	9033650080000
10.000	10.000	72.00	22.00	32.00	0.30	4	10.000	9033650100000
12.000	12.000	83.00	26.00	38.00	0.50	4	12.000	9033650120000
16.000	16.000	92.00	32.00	44.00	0.50	4	16.000	9033650160000
20.000	20.000	104.00	38.00	54.00	0.50	4	20.000	9033650200000



# Rough-Tech ALU GS100 A (3-flute) - Metric - Std Lgth - Coolant & non-Coolant

## center cutting



Standard



No. Flutes



Helix Angle



Chamfer



Rake Angle



Roughing



Ramping



Helix



HB



HB

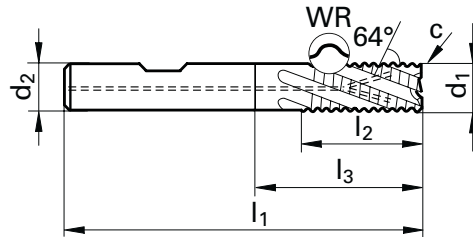
Tool material

Solid Carbide

Surface finish

Application group	Material examples	Ideal for
P	Steel	—
M	Stainless steel	—
K	Cast iron	—
N	Aluminum	●
S	Ni / Ti alloys	—
H	Hardened steel	—

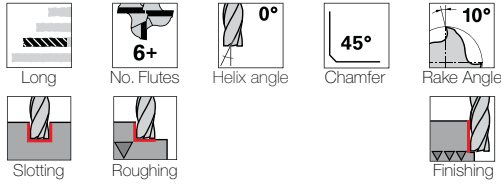
●=Optimal ○=Secondary



d1 h10	d2 h6	l1	l2	l3	c	No. of Flutes	Code no.	EDP Number	
mm	mm	mm	mm	mm	mm x 45°				
6.000	6.000	57.00	10.00	21.00	0.30	3	6.000	9033640060000	9031270060000
8.000	8.000	63.00	16.00	27.00	0.30	3	8.000	9033640080000	9031270080000
10.000	10.000	72.00	19.00	32.00	0.30	3	10.000	9033640100000	9031270100000
12.000	12.000	83.00	22.00	38.00	0.50	3	12.000	9033640120000	9031270120000
14.000	14.000	83.00	22.00	38.00	0.50	3	14.000		9031270140000
16.000	16.000	92.00	26.00	44.00	0.50	3	16.000	9033640160000	9031270160000
18.000	18.000	92.00	26.00	44.00	0.50	3	18.000		9031270180000
20.000	20.000	104.00	32.00	54.00	0.50	3	20.000	9033640200000	9031270200000
25.000	25.000	121.00	45.00	65.00	0.60	3	25.000		9031270250000

# Carbide Aerospace Routers CR 100 - Coolant Fed

## center cutting for fiber-reinforced plastics

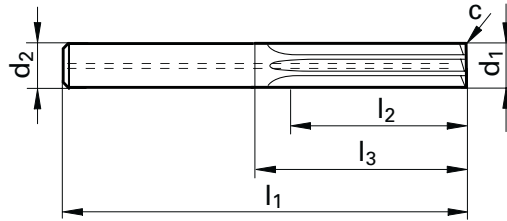


Tool material  
Surface finish

**Solid Carbide**

Application group	Material examples	Ideal for
<b>P</b>	Steel	—
<b>M</b>	Stainless steel	—
<b>K</b>	Cast iron	—
<b>N</b>	Aluminum	—
<b>S</b>	Ni / Ti alloys	—
<b>H</b>	Hardened steel	—
	Composites	●

●=Optimal    ○=Secondary



d1 e10	d2 h6	l1	l2	l3	c	No. of Flutes	Code no.	EDP Number
mm	mm	mm	mm	mm	mm x 45°			
6.000	6.000	70.00	24.00	34.00	0.15	8	6.000	9067180060000
8.000	8.000	80.00	32.00	44.00	0.15	10	8.000	9067180080000
10.000	10.000	90.00	40.00	50.00	0.15	12	10.000	9067180100000
12.000	12.000	110.00	48.00	65.00	0.15	14	12.000	9067180120000
16.000	16.000	130.00	64.00	82.00	0.15	14	16.000	9067180160000

### Cutting values: Slotting\*, HPC-roughing and copy milling

Type	Characteristic	Feed depth $a_p$	Feed width** $a_e$	Cutting speed $v_c$	fz (mm/z) with nom. Ø						
					4	6	8	10	12	16	20
<b>N</b> Aluminium	up to 7% Si	—	—	—	—	—	—	—	—	—	—
	up to 17% Si	0.5xd	1xd	220	0.02	0.03	0.04	0.05	0.06	0.07	0.09
<b>Graphite</b>	up to 8 µm grain size	1.5xd	1xd	350	0.04	0.06	0.08	0.1	0.12	0.15	0.18
<b>Composites</b>	over 50% fiber content	1xd	1xd	200	0.015	0.03	0.04	0.05	0.06	0.08	0.09

\* peripheral cooling "Guhrojet" is recommended for optimal chip evacuation and tool life, for graphite and Kevlar-machining air cooling

\*\* at lower feed width the cutting speed  $v_c$  and feed rate  $f_z$  can be increased b 30%

# Alumi-Tech GA200 A (3-flute) - Metric - Standard Lgth w/Coolant

## center cutting



Standard



No. Flutes



Helix Angle



Radius



Rake Angle



Slotting



Roughing



Ramping



Helix



Plunging



Finishing

Tool material

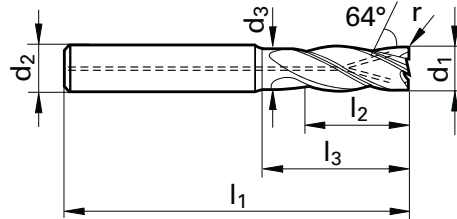
Surface finish



Solid Carbide

Application group	Material examples	Ideal for
P	Steel	—
M	Stainless steel	—
K	Cast iron	—
N	Aluminum	●
S	Ni / Ti alloys	—
H	Hardened steel	—

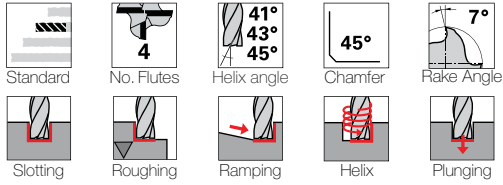
●=Optimal ○=Secondary



d1 h10	d2 h6	d3	l1	l2	l3	Corner Radius	No. of Flutes	Code no.	EDP Number
6.000	6.000	5.700	57.00	10.00	20.00	1.00	3	6.000	9033670060000
8.000	8.000	7.700	63.00	16.00	26.00	1.00	3	8.000	9033670080000
10.000	10.000	9.500	72.00	19.00	30.00	1.50	3	10.000	9033670100000
12.000	12.000	11.500	83.00	22.00	36.00	1.50	3	12.000	9033670120000
16.000	16.000	15.500	92.00	26.00	42.00	2.00	3	16.000	9033670160000
20.000	20.000	19.500	104.00	32.00	52.00	2.50	3	20.000	9033670200000
25.000	25.000	24.500	121.00	38.00	63.00	2.00	3	25.020	9033670250200

# RF 100 DIVER (3-flute) - Inch - Standard Length

center cutting with coolant through

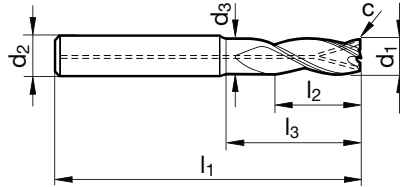


Tool material  
Surface finish



**Solid Carbide**

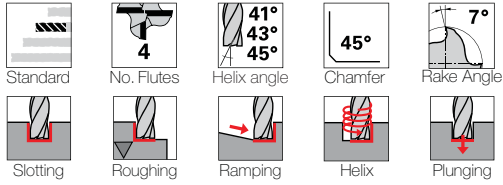
Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	—
●=Optimal    ○=Secondary		



d1 h10	d2 h6	d3	l1	l2	l3	c	No. of Flutes	Code no.	EDP Number
inch	inch	inch	inch	inch	inch	inch x 45°			
1/4	1/4	0.238	2 1/2	1/2	7/8	0.004	3	6.350	9068730063500
5/16	5/16	0.300	2 1/2	1/2	7/8	0.005	3	7.940	9068730079400
3/8	3/8	0.363	2 1/2	5/8	7/8	0.006	3	9.520	9068730095200
1/2	1/2	0.480	3	5/8	1 1/8	0.007	3	12.700	9068730127000
5/8	5/8	0.605	3 1/2	3/4	1 1/2	0.007	3	15.870	9068730158700
3/4	3/4	0.730	4	1	1 3/4	0.009	3	19.050	9068730190500

# RF 100 DIVER (3-flute) - Inch - Standard Length

center cutting with coolant through

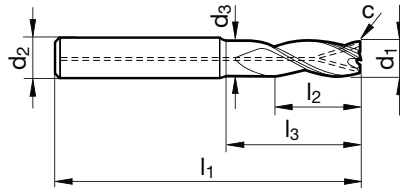


Tool material  
Surface finish

**Solid Carbide**

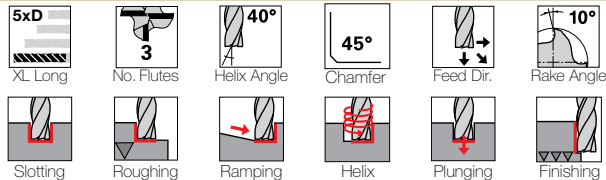
Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	●
H	Hardened steel	—

●=Optimal    ○=Secondary



d1 h10	d2 h6	d3	l1	l2	l3	c	No. of Flutes	Code no.	EDP Number
inch	inch	inch	inch	inch	inch	inch x 45°			
1/4	1/4	0.238	2 1/2	1/2	7/8	0.004	3	6.350	9068730063500
5/16	5/16	0.300	2 1/2	1/2	7/8	0.005	3	7.940	9068730079400
3/8	3/8	0.363	2 1/2	5/8	7/8	0.006	3	9.520	9068730095200
1/2	1/2	0.480	3	5/8	1 1/8	0.007	3	12.700	9068730127000
5/8	5/8	0.605	3 1/2	3/4	1 1/2	0.007	3	15.870	9068730158700
3/4	3/4	0.730	4	1	1 3/4	0.009	3	19.050	9068730190500

## RF100 Micro-Diver XL Length



Tool material  
Surface finish

Carbide

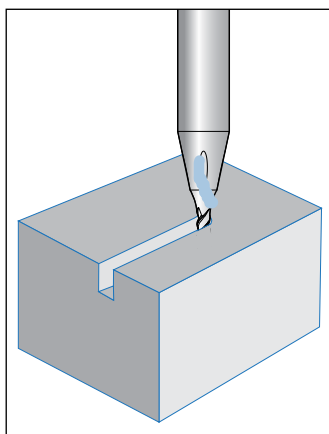
Application group	Material examples	Ideal for
P	Steel	●
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K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

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- extreme cutting values and performance
- with GührJet peripheral cooling with 4 or 6 exits
- center cutting
- with special drilling geometry



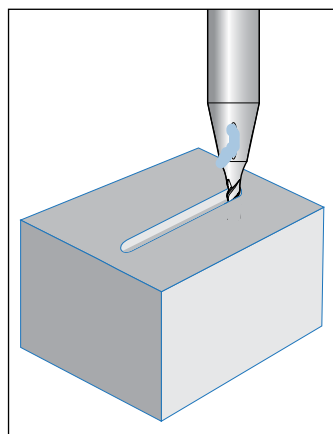
d1 h8 mm	d1 h8 inch	d2 h5 mm	l1 mm	l1 inch	l2 mm	l2 inch	l4 mm	c mm x 45°	c in x 45°	Code no.	EDP Number
1.000		4.00	45.00		5.00	0.196	12.0	0.020	0.0007	1.000	9068090010000
1.190	3/64	4.00	50.80	2	5.95	0.234	12.0	0.024	0.0009	1.190	9068090011900
1.500		4.00	50.00		7.50	0.295	13.0	0.030	0.0011	1.500	9068090015000
1.590	1/16	4.00	50.80	2	7.95	0.312	14.0	0.032	0.0012	1.590	9068090015900
1.980	5/64	6.00	57.15	2 1/4	9.90	0.389	20.0	0.040	0.0010	1.980	9068090019800
2.000		6.00	57.00		10.00	0.393	20.0	0.040	0.0010	2.000	9068090020000
2.380	3/32	6.00	57.15	2 1/4	11.90	0.468	21.0	0.048	0.0018	2.380	9068090023800
2.500		6.00	57.00		12.50	0.492	22.0	0.050	0.0019	2.500	9068090025000
2.780	7/64	6.00	57.15	2 1/4	13.90	0.547	23.0	0.056	0.0022	2.780	9068090027800
3.000		6.00	57.00		15.00	0.590	24.0	0.060	0.0023	3.000	9068090030000
3.175	1/8	6.00	57.15	2 1/4	15.87	0.624	25.0	0.064	0.0025	3.175	9068090031750



### Open Slot Milling-

The open end allows chips to more easily be evacuated from the slot.

- Higher cutting parameters are possible

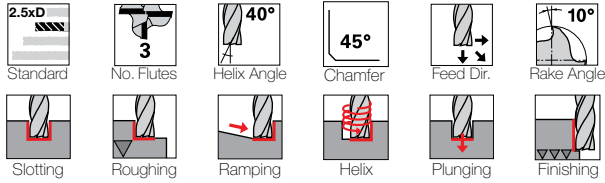


### Closed Slot Milling-

There is less space for the chips and chip evacuation is more difficult.

- Lower cutting parameters and chip volume are necessary

## RF100 Micro-Diver Standard Length



Tool material

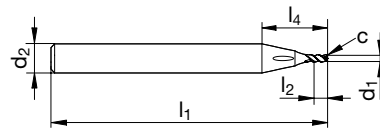
Carbide

Surface finish

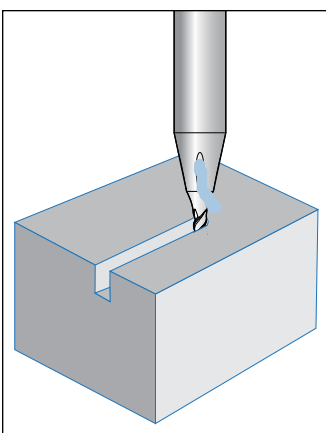
Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
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- center cutting
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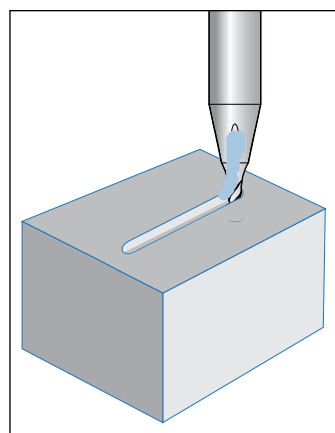
d1 h8 mm	d1 h8 inch	d2 h5 mm	l1 mm	l1 inch	l2 mm	l2 inch	l4 mm	c mm x 45°	c in x 45°	Code no.	EDP Number
0.790	1/32	4.00	38.10	1 1/2	1.97	0.078	10.0	0.016	0.0006	0.790	9068080007900
0.800		4.00	38.00		2.00	0.078	9.0	0.016	0.0006	0.800	9068080008000
1.000		4.00	38.00		2.50	0.098	9.0	0.020	0.0007	1.000	9068080010000
1.190	3/64	4.00	38.10	1 1/2	2.97	0.116	9.0	0.024	0.0009	1.190	9068080011900
1.200		4.00	38.00		3.00	0.118	9.0	0.024	0.0009	1.200	9068080012000
1.500		4.00	45.00		3.75	0.147	10.0	0.030	0.0011	1.500	9068080015000
1.590	1/16	4.00	44.45	1 3/4	3.97	0.156	10.0	0.032	0.0012	1.590	9068080015900
1.800		4.00	45.00		4.50	0.177	10.0	0.036	0.0014	1.800	9068080018000
1.980	5/64	6.00	50.80	2	4.95	0.190	15.0	0.040	0.0010	1.980	9068080019800
2.000		6.00	50.00		5.00	0.196	15.0	0.040	0.0010	2.000	9068080020000
2.200		6.00	50.00		5.50	0.216	15.0	0.044	0.0017	2.200	9068080022000
2.380	3/32	6.00	50.80	2	5.95	0.234	15.0	0.048	0.0018	2.380	9068080023800
2.500		6.00	50.00		6.25	0.246	15.0	0.050	0.0019	2.500	9068080025000
2.780	7/64	6.00	50.80	2	6.95	0.273	16.0	0.056	0.0022	2.780	9068080027800
2.800		6.00	50.00		7.00	0.275	16.0	0.056	0.0022	2.800	9068080028000
3.000		6.00	50.00		7.50	0.295	16.0	0.060	0.0023	3.000	9068080030000
3.175	1/8	6.00	50.80	2	7.93	0.312	17.0	0.064	0.0025	3.175	9068080031750



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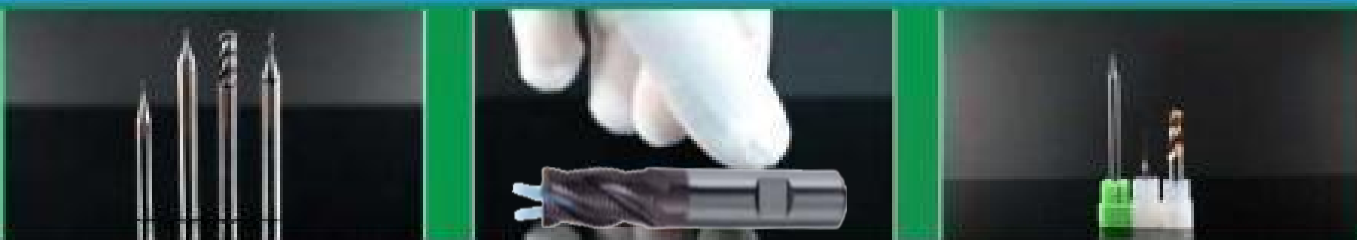
- Higher cutting parameters are possible



### Closed Slot Milling-

There is less space for the chips and chip evacuation is more difficult.

- Lower cutting parameters and chip volume are necessary



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