



THE FUTURE OF PRECISION MACHINING






OPTIMUM

LINE

The most versatile program for multiple materials and applications



SQUARE ENDMILLS


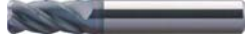

	EDP No.	Design		Page	Stock
	918	DP Standard		6	●
	981	DP Standard with recess		6	○

R-LIKE ENDMILLS




	EDP No.	Design		Page	Stock
	K47	DP R-LIKE		8	●
	K38	DP R-LIKE with weldon		8	●
	K52	DP R-LIKE with recess		8	○
	K53	DP R-LIKE with recess and weldon		8	○

TORUS ENDMILLS






NEW

	EDP No.	Design		Page	Stock
	919	DP Torus		10	●
	991	DP Torus with recess		10	○

BALLNOSES

	EDP No.	Design		Page	Stock
	929	Standard		13	●
	F38	Standard with recess		13	○

DRILLS

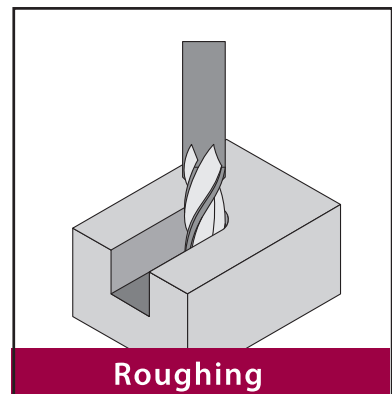
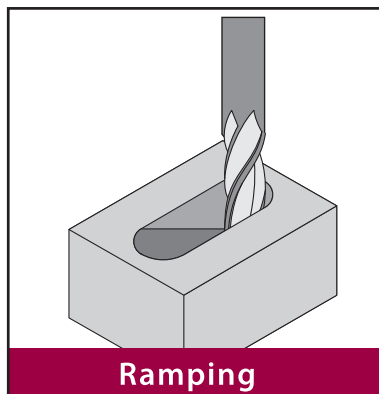
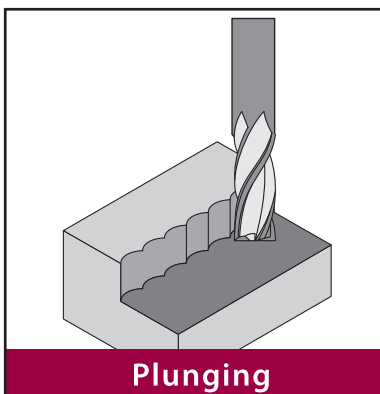
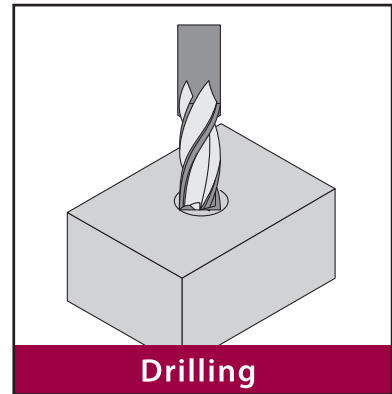
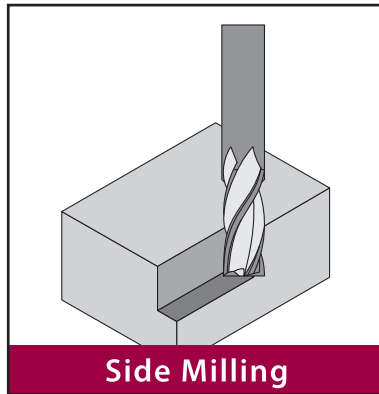
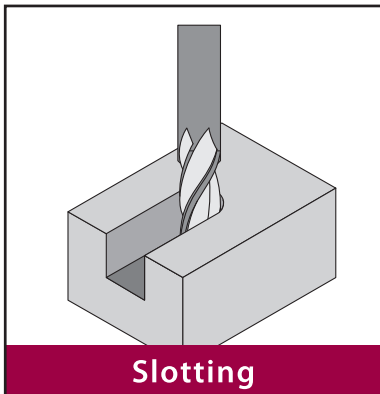
	EDP No.	Design		Page	Stock
	W08	DIN 6537K - 3 x Ø		16	●
	W09	DIN 6537L - 5 x Ø		20	●
	W10	DIN 6537K - 3 x Ø with oil hole		16	●
	W11	DIN 6537L - 5 x Ø with oil hole		20	●

The Optimum Line is designed to bring versatility in a single tool for those seeking a one-stop solution to today's most common machining applications and materials.

Suitable for multiple materials :



Suitable for multiple applications :



Slotting Test Report on P20


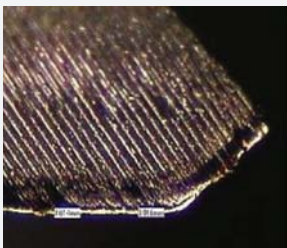
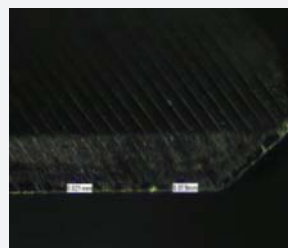
WORKPIECES	CUTTING CONDITIONS
Material : P20	Cutting Speed : 4500 rpm (Vc = 127m/min)
.....	Feed Rate : 540 mm/min (fz = 0.03 mm/z)
Hardness : < 40HRC	Ap : 6 mm
	Ae : 6 mm
	Coolant : Dry cut with air blow
	Machine : Makino S33



Operation Type : Slotting

Tool Diameter : 6 mm
 Total Cutting Distance : 12 Meters
 Total Cutting Time : 0.5 Hours
 MRR (Q) : 19.44 cm³/min

After the 60th Layer (12 Meters)

	STANDARD LINE	OPTIMUM LINE
		
	Load = 23%	Load = 20.2%
	Avg. Flank Wear = 0.035 mm	Avg. Flank Wear = 0.024 mm



SQUARE ENDMILLS

918 DP Standard

981 DP Standard With Recess

01

Differential Pitch (DP) Design

Reduces Vibrations
· Maximizes productivity and tool life



02

Ideal Cutting Edge

Enhance Durability
· Provides edge protection to prolong tool life



03

Suitable for material groups :





EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)					918 *	981 *
	D	l1	l2*	L	d2 (h6)	Normal	Recess [®]
0100 050 03	1	3	-	50	3	•	○
0100 050 04	1	3	-	50	4	•	○
0150 050 03	1.5	4.5	-	50	3	•	○
0150 050 04	1.5	4.5	-	50	4	•	○
0200 050 03	2	6.5	-	50	3	•	○
0200 050 04	2	6.5	-	50	4	•	○
0250 050 03	2.5	6.5	-	50	3	•	○
0250 050 04	2.5	6.5	-	50	4	•	○
0300 050 03	3	9	14	50	3	•	○
0300 050 04	3	9	14	50	4	•	○
0300 050 06	3	9	14	50	6	•	○
0400	4	12	20	50	4	•	○
0400 050 06	4	12	-	50	6	•	○
0500	5	15	22	50	5	•	○
0500 050 06 15	5	15	-	50	6	•	○
0600 050 16	6	16	-	50	6	•	○
0600 060	6	20	24	60	6	•	○
0800 22	8	22	28	64	8	•	○
1000 070 27	10	27	-	70	10	•	○
1000 075	10	22	30	75	10	•	○
1200 075 32	12	32	-	75	12	•	○
1200 075 24	12	24	30	75	12	•	○
1400	14	32	42	90	14	•	○
1600	16	32	42	90	16	•	○
1800	18	38	50	100	18	•	○
2000	20	38	50	100	20	•	○

Ø mm	Tol. µm
3.0-6.0	-0/-20
6.0-20.0	-0/-25

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

Cutting Parameter

25-26

R-LIKE ENDMILLS

K47 DP

K52 DP With Recess

K38 DP With Weldon

K53 DP With Recess and Weldon

01

Differential Pitch (DP) Design

- Reduces Vibrations
- Maximizes productivity and tool life



02

Ideal Cutting Edge

- Enhance Durability
- Provides edge protection to prolong tool life



03

R-Like

- Enhances edge protection



04

Suitable for material groups :





EDP No. / EDV-Nr. / CODE usine / Codice EDP	Dimension (mm)						K47*	K52*	K38*	K53*
	D	l1	l2*	L	d2 (h6)	R-Like	HA	HA	HB	HB
= * + Ø data	D	l1	l2*	L	d2 (h6)	R-Like	Normal	Recess*	Normal	Recess*
0100 050 03	1	3		50	3	0.02	•	-	•	-
0150 050 03	1.5	4.5		50	3	0.05	•	-	•	-
0200 050 03	2	6.5		50	3	0.05	•	-	•	-
0250 050 03	2.5	6.5		50	3	0.05	•	-	•	-
0300 050 03	3	9	15	50	3	0.1	•	-	•	-
0300 050 06	3	9	15	50	6	0.1	•	○	•	○
0400	4	12	20	50	4	0.1	•	-	•	-
0400 057 06 11	4	11	20	57	6	0.1	•	○	•	○
0500	5	15	20	50	5	0.1	•	-	•	-
0500 057 06 13	5	13	20	57	6	0.1	•	○	•	○
0600 057 13	6	13	20	57	6	0.1	•	○	•	○
0600 060	6	20	25	60	6	0.1	•	○	•	○
0800	8	20	26	64	8	0.2	•	○	•	○
1000 072	10	22	32	72	10	0.2	•	○	•	○
1000 070 27	10	27	32	70	10	0.2	•	○	•	○
1200 083 26	12	26	37	83	12	0.2	•	○	•	○
1400 083 26	14	26	37	83	14	0.2	•	○	•	○
1600 092	16	32	42	92	16	0.2	•	○	•	○
1800 092 32	18	32	42	92	18	0.2	○	○	○	○
2000 104	20	38	50	104	20	0.2	•	○	•	○

Ø mm	Tol. µm
3.0-6.0	-0/-20
6.0-20.0	-0/-25

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

Cutting Parameter

25 - 26

TORUS ENDMILLS

919 DP Torus

991 DP Torus With Recess

01

Improved Corner Radius Design

- Enhance durability on the radius area



01

Differential Pitch (DP) Design

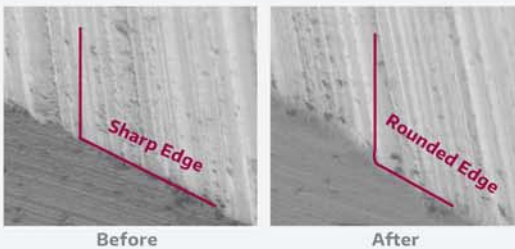
Reduces Vibrations
 · Maximizes productivity and tool life



03

Cutting Edge Preparation

Enhance Tool life
 · Less material adhering to the cutting edge, for stable machining
 · Improves wear resistance and reduces excessive friction



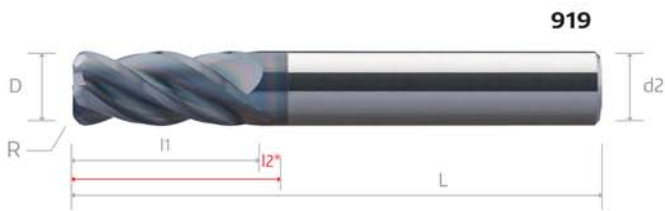
* 919



04

Suitable for material groups





EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						919*	991*
	D	l1	l2*	L	d2 (h6)	R	Normal	Recess [†]
0100 050 0300 010	1	3		50	3	0.1	•	○
0150 050 0300 020	1.5	4.5		50	3	0.2	•	○
0200 050 0300 020	2	6.5		50	3	0.2	•	○
0250 050 0300 030	2.5	6.5		50	3	0.3	•	○
0300 050 0300 030	3	9	15	50	3	0.3	•	○
0300 050 0300 050	3	9	15	50	3	0.5	•	○
0300 057 0600 030	3	9	15	57	6	0.3	•	○
0300 057 0600 050	3	9	15	57	6	0.5	•	○
0400 050 0400 030	4	12	20	50	4	0.3	•	○
0400 050 0400 050	4	12	20	50	4	0.5	•	○
0400 057 0600 030	4	12	20	57	6	0.3	•	○
0400 057 0600 050	4	12	20	57	6	0.5	•	○
0500 050 0500 030	5	15	22	50	5	0.3	•	○
0500 050 0500 050	5	15	22	50	5	0.5	•	○
0500 057 0600 030	5	15	22	57	6	0.3	•	○
0500 057 0600 050	5	15	22	57	6	0.5	•	○
0600 057 0600 030	6	16	22	57	6	0.3	•	○
0600 057 0600 050	6	16	22	57	6	0.5	•	○
0600 057 0600 100	6	16	22	57	6	1	•	○
0800 064 0800 030	8	20	26	64	8	0.3	•	○
0800 064 0800 050	8	20	26	64	8	0.5	•	○
0800 064 0800 100	8	20	26	64	8	1	•	○
0800 064 0800 200	8	20	26	64	8	2	•	○
1000 070 1000 050	10	22	30	70	10	0.5	•	○
1000 070 1000 100	10	22	30	70	10	1	•	○
1000 070 1000 200	10	22	30	70	10	2	•	○
1200 083 1200 050	12	25	35	83	12	0.5	•	○
1200 083 1200 100	12	25	35	83	12	1	•	○

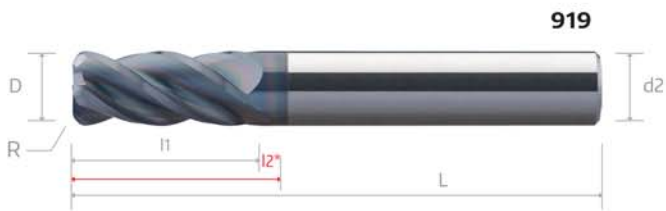
cont'd ▶

Material Group | Material-Gruppe | Groupe Matière | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

25 - 26



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						919*	991*
	D	l1	l2*	L	d2 (h6)	R	Normal	Recess [†]
1200 083 1200 200	12	25	35	83	12	2	•	○
1600 090 1600 050	16	32	42	90	16	0.5	•	○
1600 090 1600 100	16	32	42	90	16	1	•	○
1600 090 1600 200	16	32	42	90	16	2	•	○
1600 090 1600 300	16	32	42	90	16	3	•	○
2000 100 2000 050	20	38	50	100	20	0.5	•	○
2000 100 2000 100	20	38	50	100	20	1	•	○
2000 100 2000 200	20	38	50	100	20	2	•	○
2000 100 2000 300	20	38	50	100	20	3	•	○

Ø mm	Tol. µm
3.0-6.0	-0/-20
6.0-20.0	-0/-25

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类



Cutting Parameter

25 - 26

BALLNOSES

929 Standard

F38 Standard With Recess



01

Suitable for mould industry

• Meant for copper electrode and soft mould up to 40 HRC

02

B0819 - AlTiN Coating

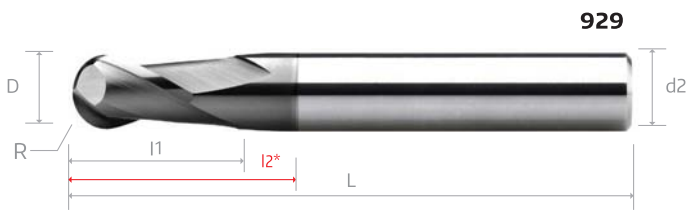
• Best suited for wet machining to increase tool life and surface finishing



03

Suitable for material groups





EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						929*	F38*
	D	R	l1	l2*	L	d2 (h6)	Normal	Recess*
0100 040 03	1	0.5	3	-	40	3	•	-
0100 050 04	1	0.5	3	-	50	4	•	-
0150 040 03	1.5	0.75	3	-	40	3	•	-
0150 050 04	1.5	0.75	3	-	50	4	•	-
0200 040 03	2	1	4	-	40	3	•	-
0200 050 04	2	1	4	-	50	4	•	-
0250 040 03	2.5	1.25	4	-	40	3	•	-
0250 050 04	2.5	1.25	4	-	50	4	•	-
0300	3	1.5	5	-	40	3	•	-
0300 050 04	3	1.5	5	14	50	4	•	○
0300 050 06	3	1.5	5	14	50	6	•	○
0350 050 04	3.5	1.75	8	20	50	4	•	○
0400	4	2	8	20	50	4	•	○
0400 050 06	4	2	8	-	50	6	•	-
0450 050 05	4.5	2.25	9	20	50	5	•	○
0500	5	2.5	9	20	50	5	•	○
0500 050 06	5	2.5	9	-	50	6	•	-
0550 050 06	5.5	2.75	10	-	50	6	•	-
0600 050	6	3	10	-	50	6	•	-
0600 060	6	3	10	24	60	6	•	○
0700 064 08	7	3.5	12	28	64	8	•	○
0800	8	4	12	28	64	8	•	○
0900 070 10	9	4.5	14	30	70	10	•	○
1000 070	10	5	14	30	70	10	•	○
1000 075	10	5	14	30	75	10	•	○
1100 075 12	11	5.5	16	30	75	12	•	○
1200	12	6	16	30	75	12	•	○
1400	14	7	32	42	90	14	•	○

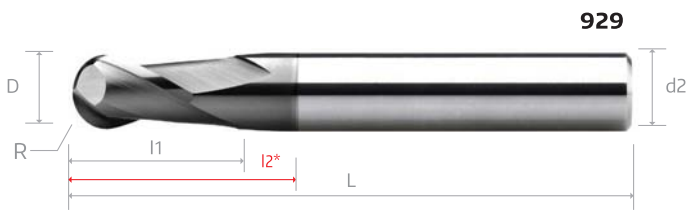
cont'd ►

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

27-28



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						929*	F38*
	D	R	l1	l2*	L	d2 (h6)	Normal	Recess*
= * + Ø data								
1600	16	8	32	42	90	16	•	○
1800	18	9	38	50	100	18	•	○
2000	20	10	38	50	100	20	•	○
2200	22	11	40	-	100	22	•	-
2500	25	12.5	40	-	100	25	•	-

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

27 - 28

DRILLS

W08 3 X D **W10** 3 X D With Oil Hole

W09 5 X D **W11** 5 X D With Oil Hole

01

Wider chip pocket

· Enhances and smoother chip evacuation

02

Straight edge profile

· Shorter chip and reinforced cutting edge

03

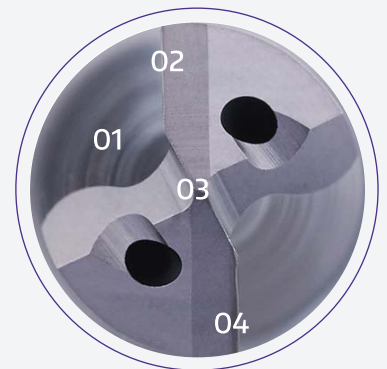
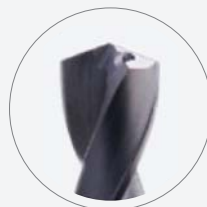
Bigger K-Value

· Suitable for higher feed rate and enhanced tool durability

04

Corner edge chamfer

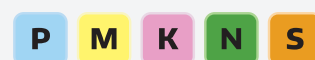
· Ideal for cast iron and better surface finishing

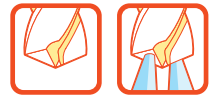


05

Versatile

· Suitable for Material Groups





EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W08*	W10*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
= * + Ø data								
0300	3	14	20	36	62	6	•	•
0310	3.1	14	20	36	62	6	•	•
0320	3.2	14	20	36	62	6	•	•
0330	3.3	14	20	36	62	6	•	•
0340	3.4	14	20	36	62	6	•	•
0350	3.5	14	20	36	62	6	•	•
0360	3.6	14	20	36	62	6	•	•
0370	3.7	14	20	36	62	6	•	•
0380	3.8	17	24	36	66	6	•	•
0390	3.9	17	24	36	66	6	•	•
0400	4	17	24	36	66	6	•	•
0410	4.1	17	24	36	66	6	•	•
0420	4.2	17	24	36	66	6	•	•
0430	4.3	17	24	36	66	6	•	•
0440	4.4	17	24	36	66	6	•	•
0450	4.5	17	24	36	66	6	•	•
0460	4.6	17	24	36	66	6	•	•
0470	4.7	17	24	36	66	6	•	•
0480	4.8	20	28	36	66	6	•	•
0490	4.9	20	28	36	66	6	•	•
0500	5	20	28	36	66	6	•	•
0510	5.1	20	28	36	66	6	•	•
0520	5.2	20	28	36	66	6	•	•
0530	5.3	20	28	36	66	6	•	•
0540	5.4	20	28	36	66	6	•	•
0550	5.5	20	28	36	66	6	•	•
0560	5.6	20	28	36	66	6	•	•
0570	5.7	20	28	36	66	6	•	•
0580	5.8	20	28	36	66	6	•	•
0590	5.9	20	28	36	66	6	•	•

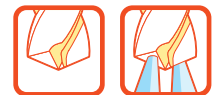
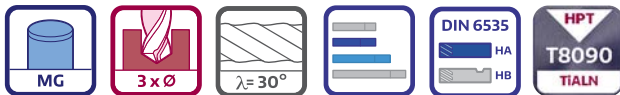
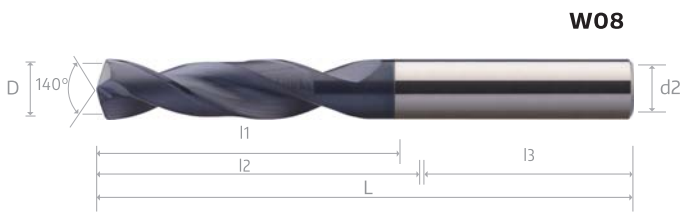
cont'd ►

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

29 - 32



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W08*	W10*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
= * + Ø data								
0600	6	20	28	36	66	6	•	•
0610	6.1	24	34	36	79	8	•	•
0620	6.2	24	34	36	79	8	•	•
0630	6.3	24	34	36	79	8	•	•
0640	6.4	24	34	36	79	8	•	•
0650	6.5	24	34	36	79	8	•	•
0660	6.6	24	34	36	79	8	•	•
0670	6.7	24	34	36	79	8	•	•
0680	6.8	24	34	36	79	8	•	•
0690	6.9	24	34	36	79	8	•	•
0700	7	24	34	36	79	8	•	•
0710	7.1	29	41	36	79	8	•	•
0720	7.2	29	41	36	79	8	•	•
0730	7.3	29	41	36	79	8	•	•
0740	7.4	29	41	36	79	8	•	•
0750	7.5	29	41	36	79	8	•	•
0760	7.6	29	41	36	79	8	•	•
0770	7.7	29	41	36	79	8	•	•
0780	7.8	29	41	36	79	8	•	•
0790	7.9	29	41	36	79	8	•	•
0800	8	29	41	36	79	8	•	•
0810	8.1	35	47	40	89	10	•	•
0820	8.2	35	47	40	89	10	•	•
0830	8.3	35	47	40	89	10	•	•
0840	8.4	35	47	40	89	10	•	•
0850	8.5	35	47	40	89	10	•	•
0860	8.6	35	47	40	89	10	•	•
0870	8.7	35	47	40	89	10	•	•
0880	8.8	35	47	40	89	10	•	•
0890	8.9	35	47	40	89	10	•	•

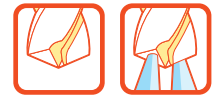
cont'd ▶

Material Group | Material-Gruppe | Groupe Matière | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

29 - 32



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W08*	W10*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
= * + Ø data								
0900	9	35	47	40	89	10	•	•
0910	9.1	35	47	40	89	10	•	•
0920	9.2	35	47	40	89	10	•	•
0930	9.3	35	47	40	89	10	•	•
0940	9.4	35	47	40	89	10	•	•
0950	9.5	35	47	40	89	10	•	•
0960	9.6	35	47	40	89	10	•	•
0970	9.7	35	47	40	89	10	•	•
0980	9.8	35	47	40	89	10	•	•
0990	9.9	35	47	40	89	10	•	•
1000	10	35	47	40	89	10	•	•
1010	10.1	40	55	45	102	12	•	•
1020	10.2	40	55	45	102	12	•	•
1030	10.3	40	55	45	102	12	•	-
1040	10.4	40	55	45	102	12	•	-
1050	10.5	40	55	45	102	12	•	•
1060	10.6	40	55	45	102	12	•	-
1070	10.7	40	55	45	102	12	•	-
1080	10.8	40	55	45	102	12	•	•
1090	10.9	40	55	45	102	12	•	-
1100	11	40	55	45	102	12	•	•
1110	11.1	40	55	45	102	12	•	-
1120	11.2	40	55	45	102	12	•	•
1130	11.3	40	55	45	102	12	•	•
1140	11.4	40	55	45	102	12	•	-
1150	11.5	40	55	45	102	12	•	•
1160	11.6	40	55	45	102	12	•	-
1170	11.7	40	55	45	102	12	•	-
1180	11.8	40	55	45	102	12	•	•
1190	11.9	40	55	45	102	12	•	-

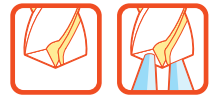
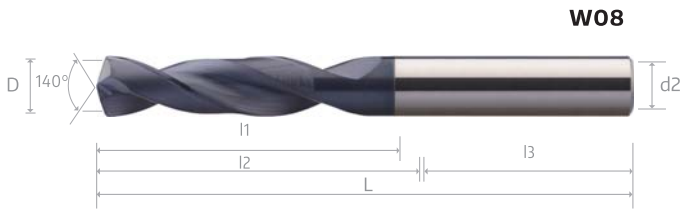
cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

29 - 32



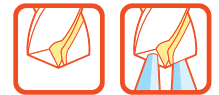
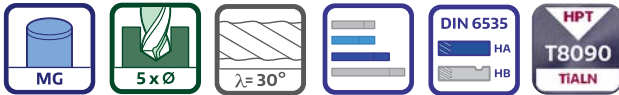
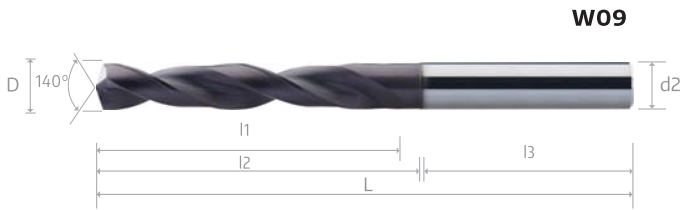
EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W08*	W10*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
= * + Ø data								
1200	12	40	55	45	102	12	•	•
1220	12.2	43	60	45	107	14	-	•
1250	12.5	43	60	45	107	14	•	•
1270	12.7	43	60	45	107	14	•	•
1280	12.8	43	60	45	107	14	-	•
1300	13	43	60	45	107	14	•	•
1330	13.3	43	60	45	107	14	-	•
1350	13.5	43	60	45	107	14	•	•
1370	13.7	43	60	45	107	14	•	•
1400	14	43	60	45	107	14	•	•
1450	14.5	45	65	48	115	16	•	•
1500	15	45	65	48	115	16	•	•
1550	15.5	45	65	48	115	16	•	•
1600	16	45	65	48	115	16	•	•
1650	16.5	51	73	48	123	18	•	•
1700	17	51	73	48	123	18	•	•
1750	17.5	51	73	48	123	18	•	•
1800	18	51	73	48	123	18	•	•
1850	18.5	55	79	50	131	20	•	•
1900	19	55	79	50	131	20	•	•
1950	19.5	55	79	50	131	20	•	•
2000	20	55	79	50	131	20	•	•

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

29 - 32



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W09*	W11*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
0300 066 03	3	23	28	36	66	3	-	•
0300	3	23	28	36	66	6	•	•
0310 066 03	3.1	23	28	36	66	3	-	•
0310	3.1	23	28	36	66	6	○	•
0320 066 03	3.2	23	28	36	66	3	-	•
0320	3.2	23	28	36	66	6	○	•
0330	3.3	23	28	36	66	6	○	•
0340	3.4	23	28	36	66	6	○	•
0350	3.5	23	28	36	66	6	•	•
0360	3.6	23	28	36	66	6	○	•
0370	3.7	23	28	36	66	6	○	•
0380	3.8	29	36	36	74	6	○	•
0390	3.9	29	36	36	74	6	○	•
0400 074 04	4	29	36	36	74	4	-	•
0400	4	29	36	36	74	6	•	•
0410 074 04	4.1	29	36	36	74	4	-	•
0410	4.1	29	36	36	74	6	○	•
0420 074 04	4.2	29	36	36	74	4	-	•
0420	4.2	29	36	36	74	6	○	•
0430	4.3	29	36	36	74	6	○	•
0440	4.4	29	36	36	74	6	○	•
0450	4.5	29	36	36	74	6	•	•
0460	4.6	29	36	36	74	6	○	•
0470	4.7	29	36	36	74	6	○	•
0480	4.8	35	44	36	82	6	○	•
0490	4.9	35	44	36	82	6	○	•
0500	5	35	44	36	82	6	•	•
0510	5.1	35	44	36	82	6	○	•
0520	5.2	35	44	36	82	6	○	•
0530	5.3	35	44	36	82	6	○	•

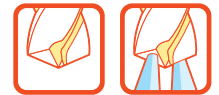
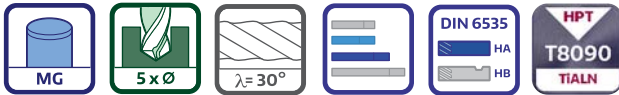
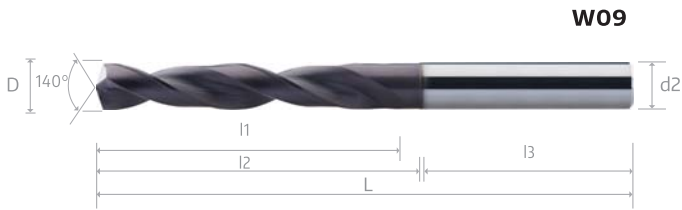
cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

29 - 32



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W09*	W11*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
0540	5.4	35	44	36	82	6	○	●
0550	5.5	35	44	36	82	6	●	●
0560	5.6	35	44	36	82	6	○	●
0570	5.7	35	44	36	82	6	○	●
0580	5.8	35	44	36	82	6	○	●
0590	5.9	35	44	36	82	6	○	●
0600	6	35	44	36	82	6	●	●
0610 082 06	6.1	35	44	36	82	6	-	●
0610	6.1	43	53	36	91	8	○	●
0620	6.2	43	53	36	91	8	○	●
0630	6.3	43	53	36	91	8	○	●
0640	6.4	43	53	36	91	8	○	●
0650	6.5	43	53	36	91	8	●	●
0660	6.6	43	53	36	91	8	○	●
0670	6.7	43	53	36	91	8	○	●
0680	6.8	43	53	36	91	8	○	●
0690	6.9	43	53	36	91	8	○	●
0700	7	43	53	36	91	8	●	●
0710	7.1	43	53	36	91	8	○	●
0720	7.2	43	53	36	91	8	○	●
0730	7.3	43	53	36	91	8	○	●
0740	7.4	43	53	36	91	8	○	●
0750	7.5	43	53	36	91	8	●	●
0760	7.6	43	53	36	91	8	○	●
0770	7.7	43	53	36	91	8	○	●
0780	7.8	43	53	36	91	8	○	●
0790	7.9	43	53	36	91	8	○	●
0800	8	43	53	36	91	8	●	●
0810 091 08	8.1	43	53	36	91	8	-	●
0810	8.1	49	61	40	103	10	○	●

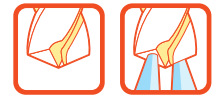
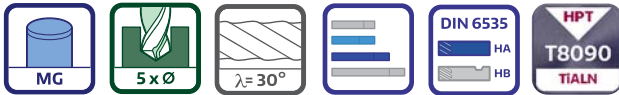
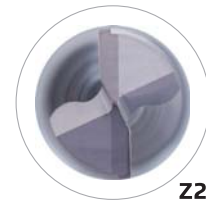
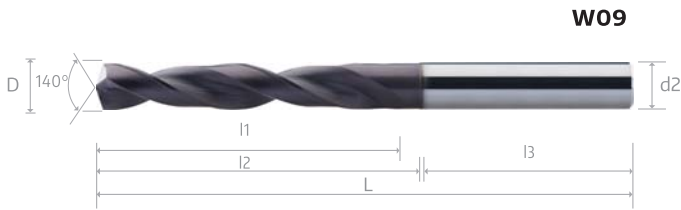
cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

29 - 32



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W09*	W11*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
= * + Ø data								
0820	8.2	49	61	40	103	10	○	●
0830	8.3	49	61	40	103	10	○	●
0840	8.4	49	61	40	103	10	○	●
0850	8.5	49	61	40	103	10	●	●
0860	8.6	49	61	40	103	10	○	●
0870	8.7	49	61	40	103	10	○	●
0880	8.8	49	61	40	103	10	○	●
0890	8.9	49	61	40	103	10	○	●
0900	9	49	61	40	103	10	●	●
0910	9.1	49	61	40	103	10	○	●
0920	9.2	49	61	40	103	10	○	●
0930	9.3	49	61	40	103	10	○	●
0940	9.4	49	61	40	103	10	○	●
0950	9.5	49	61	40	103	10	●	●
0960	9.6	49	61	40	103	10	○	●
0970	9.7	49	61	40	103	10	○	●
0980	9.8	49	61	40	103	10	○	●
0990	9.9	49	61	40	103	10	○	●
1000	10	49	61	40	103	10	●	●
1010	10.1	56	71	45	118	12	○	-
1020	10.2	56	71	45	118	12	○	●
1030	10.3	56	71	45	118	12	○	-
1040	10.4	56	71	45	118	12	○	-
1050	10.5	56	71	45	118	12	●	●
1060	10.6	56	71	45	118	12	○	-
1070	10.7	56	71	45	118	12	○	-
1080	10.8	56	71	45	118	12	○	●
1090	10.9	56	71	45	118	12	○	-
1100	11	56	71	45	118	12	●	●
1110	11.1	56	71	45	118	12	○	-

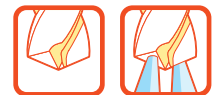
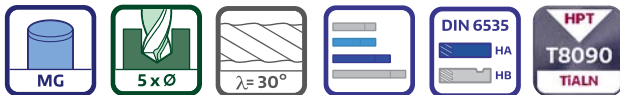
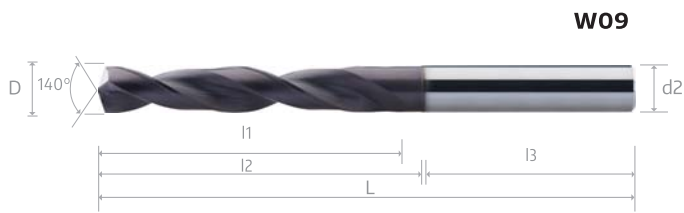
cont'd ▶

Material Group | Material-Gruppe | Groupe Matière | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

29 - 32



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W09*	W11*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
= * + Ø data								
1120	11.2	56	71	45	118	12	○	●
1130	11.3	56	71	45	118	12	○	●
1140	11.4	56	71	45	118	12	○	-
1150	11.5	56	71	45	118	12	●	●
1160	11.6	56	71	45	118	12	○	-
1170	11.7	56	71	45	118	12	○	-
1180	11.8	56	71	45	118	12	○	●
1190	11.9	56	71	45	118	12	○	-
1200	12	60	77	45	124	12	●	●
1220	12.2	60	77	45	124	14	○	●
1250	12.5	60	77	45	124	14	●	●
1270	12.7	60	77	45	124	14	○	●
1280	12.8	60	77	45	124	14	○	●
1300	13	60	77	45	124	14	●	●
1330	13.3	60	77	45	124	14	○	●
1350	13.5	60	77	45	124	14	●	●
1370	13.7	60	77	45	124	14	○	●
1380	13.8	60	77	45	124	14	○	●
1400	14	60	77	45	124	14	●	●
1450	14.5	63	83	48	133	16	●	●
1500	15	63	83	48	133	16	●	●
1530	15.3	63	83	48	133	16	○	●
1550	15.5	63	83	48	133	16	●	●
1580	15.8	63	83	48	133	16	○	●
1600	16	63	83	48	133	16	●	●
1650	16.5	71	93	48	143	18	●	●
1700	17	71	93	48	143	18	●	●
1750	17.5	71	93	48	143	18	●	●
1800	18	71	93	48	143	18	●	●
1850	18.5	77	101	50	153	20	●	●

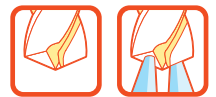
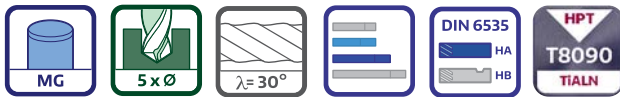
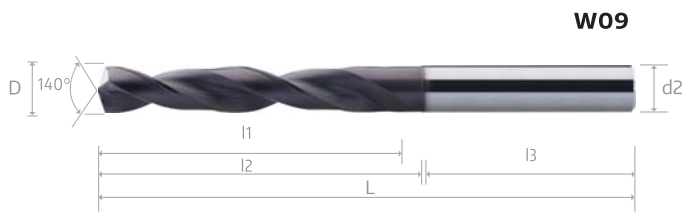
cont'd ▶

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

29 - 32



EDP No. / EDV-Nr / CODE usine / Codice EDP	Dimension (mm)						W09*	W11*
	D	l1	l2	l3	L	d2 (h6)	Without Oil Hole	With Oil Hole
1900	19	77	101	50	153	20	•	•
1950	19.5	77	101	50	153	20	•	•
2000	20	77	101	50	153	20	•	•

Material Group | Material-Gruppe | Groupe Matiere | Gruppo Materiali | 材质主类

Cutting Parameter

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O01	O02
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

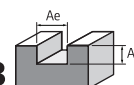
29 - 32

DP Standard / DP Torus / R-Like, 4 Flute - 918, 981, 919, 991, K38, K47, K52, K53



Ramping	P01		P02		P03		M01		M02		K01		K02		N01		N02		N03		S01		S02	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel				Grey Cast iron		Ductile Cast Iron		Wrought Aluminium		Cast Aluminium		Copper Alloy		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		Si < 9%		Si ≥ 9%		-		-		-	
Ramping Depth	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ramping Angle	5°		5°		3°		3°		2°		5°		3°		10°		10°		8°		2°		1°	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1		0.003		0.002		0.001		0.001		0.001		0.003		0.001		0.003		0.003		0.003		0.001		0.001
2		0.005		0.004		0.006		0.006		0.003		0.005		0.006		0.004		0.005		0.004		0.003		0.004
3		0.008		0.007		0.009		0.009		0.005		0.008		0.009		0.009		0.009		0.009		0.005		0.006
4		0.012		0.011		0.013		0.013		0.007		0.012		0.013		0.012		0.012		0.012		0.007		0.008
5		0.015		0.014		0.017		0.017		0.009		0.015		0.017		0.016		0.016		0.016		0.009		0.010
6		0.018		0.017		0.021		0.021		0.011		0.018		0.021		0.020		0.020		0.020		0.011		0.012
8	200	0.025	140	0.024	70	0.028	70	0.028	50	0.014	200	0.025	65	0.028	250	0.027	220	0.027	210	0.026	50	0.014	35	0.016
10		0.032		0.031		0.035		0.035		0.025		0.032		0.035		0.034		0.034		0.034		0.025		0.026
12		0.040		0.039		0.045		0.045		0.030		0.040		0.045		0.042		0.042		0.042		0.030		0.031
14		0.046		0.045		0.051		0.051		0.035		0.046		0.051		0.048		0.048		0.048		0.035		0.036
16		0.052		0.051		0.058		0.058		0.040		0.052		0.058		0.054		0.054		0.054		0.040		0.042
18		0.058		0.056		0.063		0.063		0.045		0.058		0.063		0.060		0.060		0.060		0.045		0.047
20		0.063		0.062		0.070		0.070		0.050		0.063		0.070		0.066		0.066		0.066		0.050		0.052

DP Standard / DP Torus / R-Like, 4 Flute - 918, 981, 919, 991, K38, K47, K52, K53

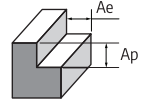


Slotting	P01		P02		P03		M01		M02		K01		K02		N01		N02		N03		S01		S02	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel				Grey Cast iron		Ductile Cast Iron		Wrought Aluminium		Cast Aluminium		Copper Alloy		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		Si < 9%		Si ≥ 9%		-		-		-	
Cutting Depth, Ap (mm)	1.00 × D		1.00 × D		0.80 × D		0.80 × D		0.40 × D		1.00 × D		0.80 × D		1.00 × D		1.00 × D		1.00 × D		0.40 × D		0.30 × D	
Cutting Width, Ae (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1		0.003		0.003		0.003		0.003		0.003		0.003		0.003		0.005		0.004		0.004		0.004		0.004
2		0.006		0.006		0.006		0.006		0.007		0.006		0.006		0.007		0.006		0.006		0.009		0.009
3		0.009		0.009		0.009		0.010		0.011		0.009		0.009		0.011		0.010		0.010		0.014		0.014
4		0.012		0.012		0.012		0.014		0.016		0.012		0.013		0.016		0.015		0.015		0.019		0.019
5		0.016		0.016		0.016		0.018		0.020		0.016		0.017		0.021		0.020		0.020		0.024		0.024
6		0.019		0.019		0.019		0.022		0.025		0.019		0.021		0.026		0.026		0.026		0.030		0.030
8	200	0.026	160	0.026	150	0.026	120	0.030	80	0.034	170	0.026	110	0.028	330	0.037	300	0.036	280	0.038	60	0.040	30	0.040
10		0.033		0.034		0.033		0.038		0.044		0.033		0.035		0.048		0.047		0.047		0.051		0.051
12		0.041		0.041		0.041		0.047		0.054		0.041		0.043		0.060		0.061		0.061		0.063		0.063
14		0.047		0.047		0.047		0.054		0.062		0.047		0.049		0.068		0.070		0.070		0.072		0.072
16		0.054		0.053		0.054		0.061		0.069		0.054		0.055		0.075		0.078		0.078		0.080		0.080
18		0.060		0.058		0.060		0.067		0.076		0.060		0.061		0.083		0.080		0.080		0.088		0.088
20		0.066		0.064		0.066		0.073		0.082		0.066		0.067		0.090		0.086		0.086		0.096		0.096



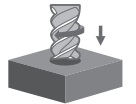
Recommended Cutting Data
 Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

DP Standard / DP Torus / R-Like, 4 Flute - 918, 981, 919, 991, K38, K47, K52, K53



Side Milling	P01		P02		P03		M01		M02		K01		K02		N01		N02		N03		S01		S02	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel				Grey Cast iron		Ductile Cast Iron		Wrought Aluminium		Cast Aluminium		Copper Alloy		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		Si < 9%		Si ≥ 9%		-		-		-	
Cutting Depth, Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Cutting Width, Ae (mm)	0.25 × D		0.20 × D		0.18 × D		0.18 × D		0.15 × D		0.25 × D		0.18 × D		0.30 × D		0.30 × D		0.30 × D		0.15 × D		0.10 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1		0.005		0.006		0.005		0.004		0.005		0.007		0.004		0.006		0.005		0.004		0.005		0.004
2		0.009		0.009		0.009		0.009		0.011		0.010		0.009		0.009		0.008		0.009		0.011		0.008
3		0.017		0.014		0.014		0.014		0.017		0.016		0.014		0.014		0.014		0.014		0.018		0.013
4		0.023		0.020		0.019		0.020		0.024		0.022		0.019		0.020		0.019		0.021		0.024		0.018
5		0.030		0.025		0.024		0.025		0.030		0.029		0.025		0.027		0.026		0.027		0.031		0.025
6		0.036		0.031		0.031		0.031		0.037		0.036		0.030		0.034		0.034		0.035		0.039		0.033
8	280	0.049	230	0.043	190	0.042	160	0.043	100	0.049	250	0.049	140	0.041	400	0.046	380	0.046	360	0.050	70	0.053	40	0.046
10		0.062		0.056		0.056		0.056		0.062		0.063		0.052		0.060		0.059		0.062		0.066		0.061
12		0.075		0.070		0.070		0.070		0.076		0.075		0.069		0.076		0.074		0.076		0.080		0.075
14		0.086		0.079		0.080		0.078		0.085		0.085		0.075		0.087		0.085		0.086		0.090		0.081
16		0.094		0.087		0.090		0.086		0.093		0.095		0.082		0.097		0.095		0.091		0.101		0.089
18		0.103		0.092		0.098		0.092		0.102		0.103		0.089		0.106		0.102		0.099		0.111		0.094
20		0.113		0.098		0.104		0.099		0.107		0.112		0.094		0.115		0.110		0.106		0.122		0.102

DP Standard / DP Torus / R-Like, 4 Flute - 918, 981, 919, 991, K38, K47, K52, K53



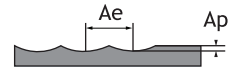
Plunging	P01		P02		K01		N01		N02		N03	
Working Material	Carbon Steel		Alloy Steel		Grey Cast iron		Wrought Aluminium		Cast Aluminium		Copper Alloy	
Properties	-		520 < Rm < 1200		-		Si < 9%		Si ≥ 9%		-	
Cutting Depth, Ap (mm)	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Cutting Width, Ae (mm)	-		-		-		-		-		-	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1		0.007		0.008		0.007		0.009		0.009		0.008
2		0.018		0.016		0.018		0.018		0.018		0.017
3		0.028		0.024		0.028		0.028		0.028		0.027
4		0.038		0.033		0.038		0.038		0.037		0.036
5		0.048		0.042		0.048		0.048		0.047		0.046
6		0.059		0.052		0.059		0.058		0.057		0.056
8	120	0.080	110	0.070	120	0.080	150	0.078	140	0.077	130	0.075
10		0.101		0.090		0.101		0.099		0.098		0.097
12		0.126		0.113		0.126		0.121		0.121		0.120
14		0.144		0.129		0.144		0.140		0.139		0.138
16		0.162		0.144		0.162		0.158		0.157		0.156
18		0.179		0.158		0.179		0.176		0.174		0.173
20		0.196		0.170		0.196		0.193		0.191		0.189



Recommended Cutting Data

Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Standard Ballnose, 2 Flute - 929, F38



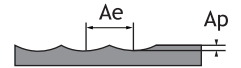
Roughing	P03		M02		K02		S02		H01	
Working Material	Prehardened Steel		Stainless Steel		Ductile Cast Iron		Nickel Alloy		Hardened Steel	
Properties	35 ≤ HRC < 45		Low Machinability		-		-		45 ≤ HRC < 52	
Cutting Depth, Ap (mm)	0.10 × D		0.08 × D		0.10 × D		0.08 × D		0.10 × D	
Cutting Width, Ae (mm)	0.32 × D		0.24 × D		0.30 × D		0.24 × D		0.30 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	185	0.013	70	0.006	160	0.008	40	0.006	140	0.009
2		0.023		0.012		0.018		0.013		0.020
3		0.036		0.018		0.029		0.020		0.032
4		0.050		0.025		0.043		0.028		0.044
5		0.065		0.032		0.059		0.035		0.056
6		0.081		0.038		0.075		0.043		0.068
8		0.112		0.051		0.104		0.058		0.098
10		0.146		0.065		0.135		0.074		0.130
12		0.183		0.080		0.168		0.090		0.162
14		0.206		0.090		0.185		0.099		0.182
16		0.230		0.103		0.206		0.115		0.198
18		0.252		0.112		0.223		0.128		0.210
20		0.270		0.125		0.238		0.138		0.224
22		0.289		0.135		0.249		0.148		0.240
25		0.305		0.146		0.264		0.168		0.252



Recommended Cutting Data

Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Standard Ballnose, 2 Flute - 929, F38



Finishing	P03		M02		K02		S02		H01	
Working Material	Prehardened Steel		Stainless Steel		Ductile Cast Iron		Nickel Alloy		Hardened Steel	
Properties	35 ≤ HRC < 45		Low Machinability		-		-		45 ≤ HRC < 52	
Cutting Depth, Ap (mm)	0.05 × D		0.05 × D		0.05 × D		0.05 × D		0.05 × D	
Cutting Width, Ae (mm)	0.02 × D		0.02 × D		0.02 × D		0.02 × D		0.02 × D	
D (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	195	0.011	80	0.004	170	0.006	50	0.004	150	0.006
2		0.019		0.008		0.015		0.008		0.016
3		0.029		0.013		0.024		0.013		0.026
4		0.041		0.018		0.034		0.018		0.035
5		0.054		0.022		0.045		0.025		0.045
6		0.068		0.028		0.056		0.030		0.054
8		0.094		0.037		0.078		0.042		0.078
10		0.124		0.046		0.105		0.052		0.104
12		0.154		0.058		0.134		0.064		0.130
14		0.173		0.065		0.148		0.072		0.146
16		0.193		0.072		0.162		0.082		0.158
18		0.211		0.082		0.176		0.090		0.168
20		0.225		0.089		0.186		0.095		0.179
22		0.238		0.092		0.197		0.105		0.192
25		0.248		0.105		0.220		0.115		0.202



Recommended Cutting Data

Note: These recommended cutting conditions indicate just references. It should be adjusted due to different cutting conditions.

Internal Coolant - Aggressive Cutting Parameter, 2 Flute - W10, W11

Drilling	P01		P02		P03		M01		M02		K01		K02		S01		S02	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel				Grey Cast iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
D (mm)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)
3		0.051		0.047		0.045		0.045		0.050		0.050		0.048		0.063		0.030
4		0.084		0.065		0.060		0.067		0.075		0.082		0.070		0.080		0.045
5		0.110		0.085		0.081		0.086		0.100		0.108		0.090		0.080		0.060
6		0.140		0.110		0.105		0.110		0.115		0.138		0.115		0.100		0.070
7		0.171		0.135		0.130		0.130		0.138		0.168		0.130		0.113		0.090
8		0.196		0.160		0.153		0.160		0.160		0.192		0.152		0.125		0.100
9		0.225		0.182		0.176		0.175		0.180		0.221		0.170		0.143		0.113
10	165	0.262	120	0.203	105	0.200	65	0.195	50	0.205	140	0.258	60	0.188	40	0.160	35	0.125
11		0.290		0.230		0.222		0.220		0.215		0.285		0.215		0.160		0.125
12		0.323		0.256		0.252		0.245		0.229		0.319		0.250		0.160		0.125
13		0.332		0.258		0.268		0.255		0.240		0.321		0.260		0.170		0.134
14		0.342		0.260		0.280		0.272		0.259		0.338		0.275		0.180		0.143
15		0.354		0.262		0.295		0.285		0.285		0.348		0.290		0.190		0.152
16		0.365		0.269		0.300		0.310		0.305		0.359		0.310		0.200		0.160
17		0.375		0.272		0.302		0.315		0.310		0.369		0.315		0.213		0.170
18		0.388		0.280		0.305		0.330		0.330		0.382		0.325		0.226		0.180
19		0.395		0.300		0.306		0.330		0.330		0.388		0.325		0.239		0.190
20		0.404		0.315		0.312		0.330		0.365		0.395		0.342		0.250		0.200

Drilling	N01		N02		N03	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45	
D (mm)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)
3		0.076		0.073		0.059
4		0.105		0.100		0.081
5		0.137		0.128		0.104
6		0.170		0.158		0.128
7		0.208		0.190		0.156
8		0.253		0.232		0.185
9		0.300		0.280		0.218
10	310	0.350	220	0.322	190	0.246
11		0.400		0.372		0.281
12		0.445		0.423		0.313
13		0.465		0.445		0.330
14		0.480		0.462		0.348
15		0.492		0.475		0.362
16		0.505		0.485		0.382
17		0.512		0.490		0.397
18		0.526		0.502		0.402
19		0.536		0.512		0.414
20		0.540		0.525		0.420



Empfohlene Schnittparameter

Hinweis: Die empfohlenen Schnittparameter dienen nur als Referenz. Diese ändern sich bei verschiedenen Schnittbedingungen.

Internal Coolant - Conventional Cutting Parameter, 2 Flute - W10, W11

Drilling	P01		P02		P03		M01		M02		K01		K02		S01		S02	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel				Grey Cast iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
D (mm)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)
3		0.062		0.061		0.045		0.040		0.042		0.058		0.038		0.045		0.035
4		0.090		0.088		0.065		0.060		0.055		0.082		0.051		0.060		0.050
5		0.118		0.114		0.080		0.080		0.075		0.105		0.068		0.080		0.060
6		0.150		0.142		0.100		0.100		0.090		0.130		0.080		0.100		0.085
7		0.185		0.170		0.120		0.120		0.110		0.155		0.100		0.110		0.100
8		0.210		0.200		0.140		0.150		0.130		0.180		0.120		0.140		0.105
9		0.235		0.224		0.165		0.160		0.145		0.202		0.130		0.162		0.110
10	90	0.260	80	0.252	65	0.185	40	0.180	30	0.165	85	0.230	35	0.150	22	0.170	15	0.130
11		0.290		0.277		0.205		0.195		0.185		0.270		0.170		0.200		0.145
12		0.330		0.315		0.220		0.220		0.220		0.305		0.200		0.235		0.180
13		0.340		0.336		0.240		0.245		0.220		0.330		0.220		0.250		0.190
14		0.360		0.352		0.255		0.250		0.235		0.345		0.230		0.250		0.195
15		0.370		0.365		0.268		0.260		0.240		0.360		0.230		0.270		0.200
16		0.390		0.382		0.285		0.280		0.270		0.395		0.250		0.280		0.210
17		0.410		0.402		0.290		0.285		0.275		0.410		0.250		0.280		0.225
18		0.430		0.400		0.310		0.285		0.275		0.410		0.250		0.310		0.230
19		0.430		0.415		0.330		0.290		0.275		0.415		0.270		0.320		0.232
20		0.445		0.435		0.335		0.290		0.295		0.425		0.270		0.320		0.233

Drilling	N01		N02		N03	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45	
D (mm)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)
3		0.069		0.065		0.050
4		0.095		0.090		0.075
5		0.125		0.120		0.100
6		0.160		0.155		0.130
7		0.195		0.190		0.165
8		0.230		0.220		0.200
9		0.280		0.250		0.230
10	240	0.320	200	0.291	160	0.270
11		0.360		0.330		0.310
12		0.406		0.370		0.350
13		0.430		0.390		0.360
14		0.450		0.410		0.370
15		0.470		0.425		0.380
16		0.485		0.450		0.390
17		0.510		0.465		0.400
18		0.520		0.480		0.405
19		0.530		0.500		0.410
20		0.540		0.520		0.418



Empfohlene Schnittparameter

Hinweis: Die empfohlenen Schnittparameter dienen nur als Referenz. Diese ändern sich bei verschiedenen Schnittbedingungen.

External Coolant - Aggressive Cutting Parameter, 2 Flute - W08, W09

Drilling	P01		P02		P03		M01		M02		K01		K02		S01		S02	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel				Grey Cast iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
D (mm)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)
3		0.072		0.048		0.050		0.048		0.040		0.070		0.048		0.035		0.035
4		0.100		0.067		0.069		0.068		0.055		0.095		0.068		0.050		0.050
5		0.128		0.085		0.094		0.087		0.070		0.120		0.087		0.065		0.060
6		0.155		0.105		0.125		0.110		0.085		0.148		0.110		0.080		0.070
7		0.185		0.132		0.150		0.135		0.105		0.176		0.135		0.100		0.090
8		0.220		0.156		0.175		0.165		0.125		0.210		0.165		0.130		0.110
9		0.245		0.180		0.190		0.185		0.140		0.240		0.185		0.145		0.110
10	105	0.280	85	0.203	60	0.215	45	0.200	35	0.165	95	0.270	40	0.200	25	0.165	20	0.120
11		0.310		0.235		0.240		0.210		0.180		0.310		0.210		0.170		0.150
12		0.360		0.260		0.280		0.250		0.200		0.345		0.250		0.210		0.160
13		0.380		0.272		0.290		0.250		0.210		0.364		0.250		0.212		0.190
14		0.402		0.285		0.310		0.260		0.230		0.390		0.260		0.235		0.200
15		0.414		0.294		0.320		0.280		0.235		0.402		0.280		0.245		0.200
16		0.450		0.313		0.335		0.290		0.245		0.440		0.290		0.265		0.220
17		0.470		0.325		0.340		0.300		0.250		0.460		0.300		0.275		0.220
18		0.485		0.315		0.360		0.320		0.255		0.475		0.320		0.280		0.220
19		0.510		0.330		0.362		0.325		0.280		0.485		0.325		0.280		0.220
20		0.530		0.340		0.380		0.326		0.280		0.485		0.326		0.290		0.220

Drilling	N01		N02		N03	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45	
D (mm)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)
3		0.058		0.057		0.056
4		0.079		0.078		0.077
5		0.099		0.098		0.097
6		0.120		0.119		0.118
7		0.143		0.141		0.140
8		0.172		0.168		0.167
9		0.202		0.200		0.195
10	200	0.235	165	0.225	140	0.222
11		0.268		0.255		0.252
12		0.300		0.290		0.287
13		0.320		0.302		0.300
14		0.333		0.324		0.320
15		0.348		0.340		0.335
16		0.361		0.356		0.351
17		0.370		0.365		0.360
18		0.385		0.375		0.374
19		0.391		0.388		0.387
20		0.406		0.392		0.390



Empfohlene Schnittparameter

Hinweis: Die empfohlenen Schnittparameter dienen nur als Referenz. Diese ändern sich bei verschiedenen Schnittbedingungen.

External Coolant - Conventional Cutting Parameter, 2 Flute - W08, W09

Drilling	P01		P02		P03		M01		M02		K01		K02		S01		S02	
Working Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel				Grey Cast iron		Ductile Cast Iron		Titanium Alloy		Nickel Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		-		-		-		-	
D (mm)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)
3		0.060		0.052		0.034		0.032		0.040		0.060		0.042		0.030		0.020
4		0.081		0.075		0.052		0.050		0.065		0.085		0.055		0.050		0.040
5		0.110		0.095		0.070		0.065		0.080		0.110		0.075		0.060		0.050
6		0.135		0.120		0.090		0.084		0.090		0.140		0.090		0.070		0.060
7		0.160		0.150		0.110		0.105		0.105		0.160		0.110		0.080		0.070
8		0.192		0.175		0.130		0.120		0.140		0.190		0.130		0.100		0.090
9		0.220		0.200		0.150		0.130		0.150		0.210		0.140		0.110		0.100
10	80	0.255	65	0.220	60	0.170	35	0.150	25	0.165	75	0.240	30	0.170	20	0.120	12	0.110
11		0.280		0.250		0.185		0.170		0.170		0.262		0.180		0.150		0.140
12		0.315		0.275		0.215		0.200		0.210		0.300		0.220		0.160		0.150
13		0.335		0.298		0.225		0.205		0.212		0.310		0.220		0.170		0.160
14		0.350		0.315		0.235		0.230		0.220		0.315		0.235		0.180		0.163
15		0.380		0.330		0.250		0.235		0.230		0.340		0.240		0.182		0.165
16		0.395		0.350		0.260		0.245		0.250		0.350		0.270		0.185		0.168
17		0.415		0.350		0.265		0.255		0.260		0.355		0.275		0.190		0.175
18		0.420		0.365		0.275		0.255		0.265		0.365		0.280		0.195		0.180
19		0.440		0.380		0.280		0.270		0.270		0.385		0.281		0.200		0.190
20		0.460		0.380		0.290		0.280		0.280		0.400		0.288		0.205		0.195

Drilling	N01		N02		N03	
Working Material	Wrought Aluminium		Cast Aluminium		Copper Alloy	
Properties	-		520 < Rm < 1200		35 ≤ HRC < 45	
D (mm)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)	Vc (m/min)	fn (mm/rev)
3		0.055		0.053		0.052
4		0.075		0.074		0.072
5		0.095		0.094		0.091
6		0.115		0.114		0.111
7		0.141		0.139		0.134
8		0.170		0.166		0.163
9		0.200		0.198		0.191
10	150	0.232	130	0.222	100	0.220
11		0.260		0.250		0.245
12		0.298		0.287		0.285
13		0.315		0.297		0.295
14		0.328		0.315		0.314
15		0.344		0.334		0.326
16		0.358		0.352		0.348
17		0.365		0.361		0.355
18		0.380		0.371		0.364
19		0.385		0.382		0.371
20		0.405		0.388		0.382



Empfohlene Schnittparameter

Hinweis: Die empfohlenen Schnittparameter dienen nur als Referenz. Diese ändern sich bei verschiedenen Schnittbedingungen.

Certificate

Standard **ISO 9001:2015**

Certificate Registr. No. **01 100 053515**

Certificate Holder:



HPMT Industries Sdn. Bhd.

No. 5, Jalan Sungai Kayu Ara 32/39, Taman Berjaya,
Seksyen 32, Shah Alam, Selangor Darul Ehsan, Malaysia

Scope:

Manufacturing of Standard and Custom-made Metal Removing
Cutting Tools

Proof has been furnished by means of an audit that the
requirements of ISO 9001:2015 are met.

Validity:

The certificate is valid from 2018-09-04 until 2021-08-14.

2018-09-14

A handwritten signature in blue ink, appearing to read 'K. Jeger', written over a horizontal line.

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln



HPMT

THE FUTURE OF PRECISION MACHINING

HPMT INDUSTRIES SDN BHD

5 Jalan Sungai Kayu Ara 32/39
Taman Berjaya, Seksyen 32
40460 Shah Alam,
Selangor Darul Ehsan, Malaysia

T + 603 5740 2218
F + 603 5740 2238
E info@hpmt-industries.com
W www.hpmt-industries.com

HERROZ SDN BHD

5 Jalan Sungai Kayu Ara 32/39
Taman Berjaya, Seksyen 32
40460 Shah Alam,
Selangor Darul Ehsan, Malaysia

T + 603 5740 2838 (Selangor)
+ 607 351 9910 (Johor)
F + 603 5740 2822 (Selangor)
+ 603 5740 2823 (Selangor)
+ 607 355 2461 (Johor)
E info@herroz.com
W www.herroz.com

MTC TOOLING SYSTEMS LTD

204-5 Fook Hong Ind Bldg
19 Shueng Yuet Road
Kowloon Bay, Hong Kong

T 00852 2305 4838
F 00852 2798 8789
E info@mtc-tools.com

HPMT (SHEN ZHEN) LTD

1223, Kerry Centre
2008 Renminnan Road
ShenZhen China

T 00755 2518 1722
F 00755 2518 1728
E info@hpmt-industries.com.cn
W www.hpmt-industries.com.cn

HPMT DEUTSCHLAND GMBH

Vorkamp 6, D-23879 Mölln

T + 49 (0) 45 42 / 84 21 10
F + 49 (0) 45 42 / 84 21 08
E info@hpmt-deutschland.de
W www.hpmt-deutschland.de