

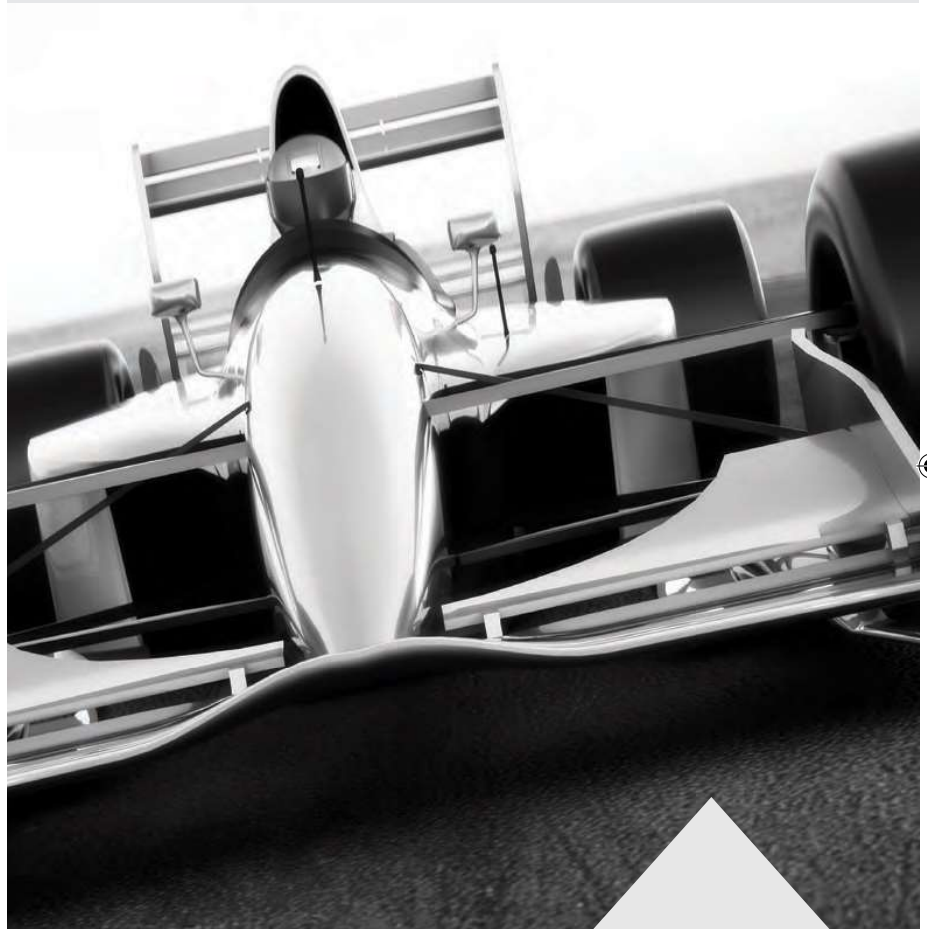


OL
OPTIMUM
LINE



HPMT
 THE FUTURE OF PRECISION MACHINING

Race towards a
 faster production



www.hpmt-industries.com



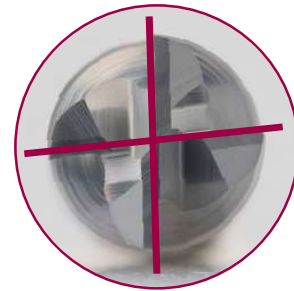
The Optimum Line series is designed to bring you premium features at cost-effective rates. With its Ideal Edge Design, it provide enhanced tool durability and less vibration for finer finishing.

1 Differential Pitch (DP) Design

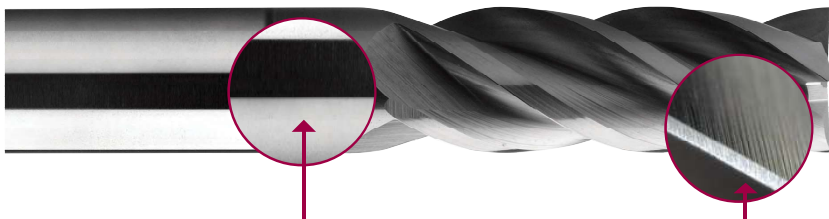
Reduces Vibrations

- Maximizes productivity and tool life

End Face View



Differential Pitch (DP)



2 Superior Coating

Enhances Heat Resistance

- Reduce tool wear to achieve cost-effective machining

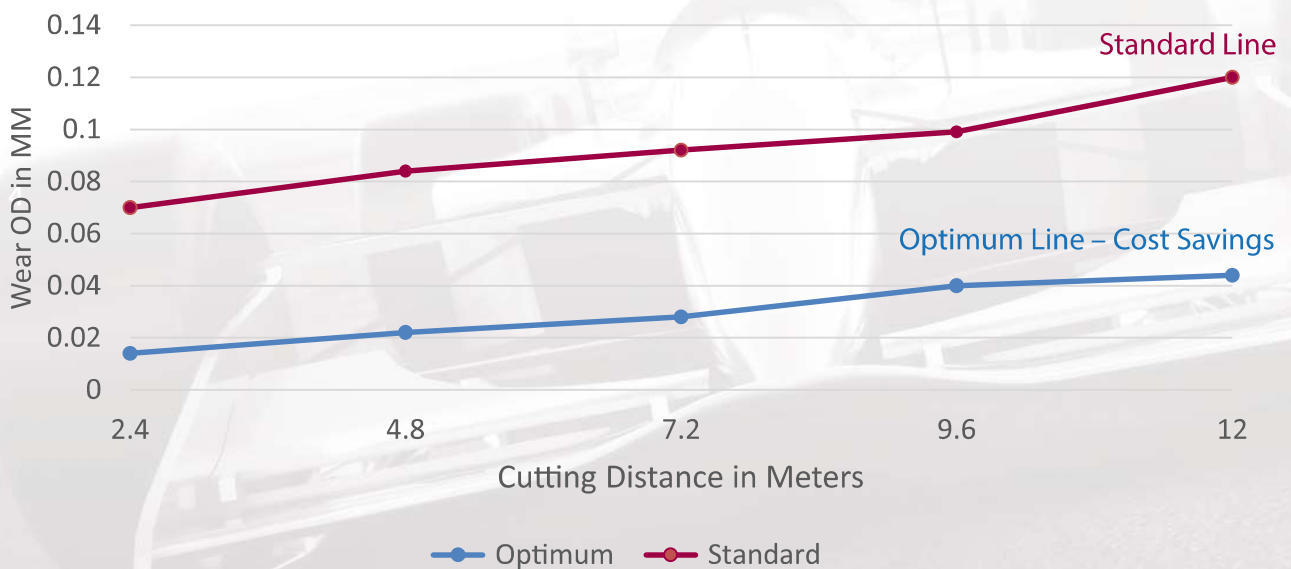
3 Ideal Cutting Edge

Enhances Durability

- Provide edge protection to prolong tool life

Disclaimer :
Wear OD Comparison Graph are based on cutting cindition on page 3

Wear OD Comparison





OL OPTIMUM LINE

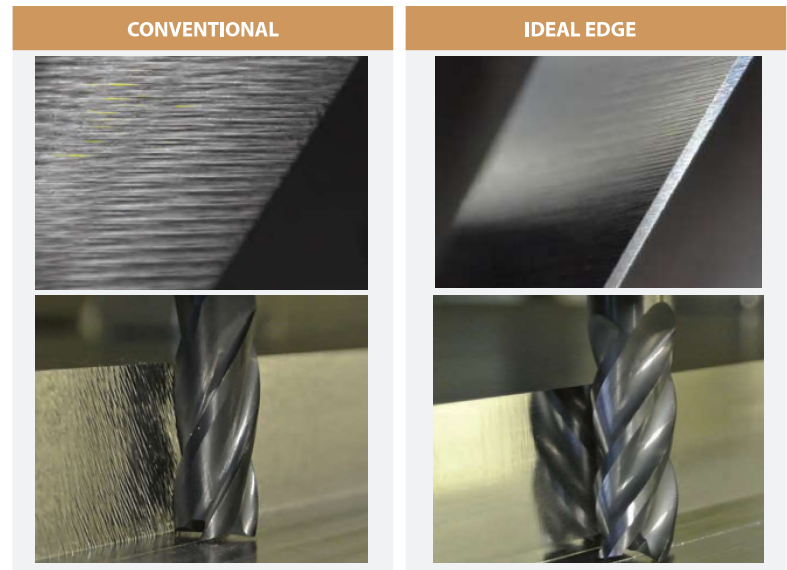


Features Comparison



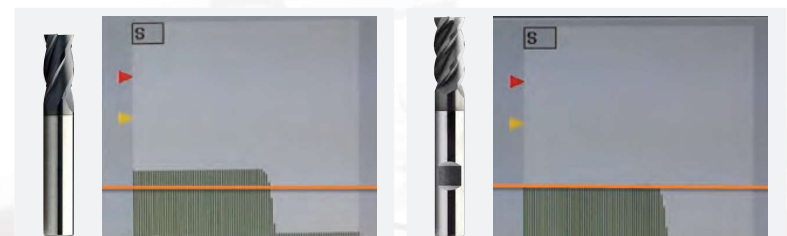
Ideal Cutting Edge

Provide a stable cutting edge with reduced possibility of chipping



Optimized Tool Geometry

Allows for improved shearing and lower spindle loads



Positive Rake Angle

Enables smooth chips evacuation due to small size chips generated



Oil and Gas





Case Study



Slotting Test Report on P20


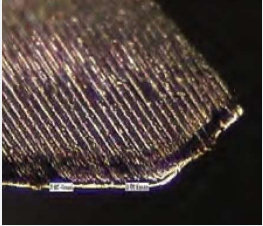
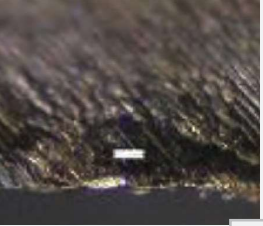
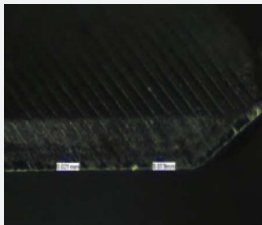
WORKPIECES	CUTTING CONDITIONS
Material	Cutting Speed : 4500 rpm (Vc = 127m/min)
.....	Feed Rate : 540 mm/min (fz = 0.03 mm/z)
Hardness	Ap : 6 mm
	Ae : 6 mm
	Coolant : Dry cut with air blow
	Machine : Makino S33



Operation Type: Slotting

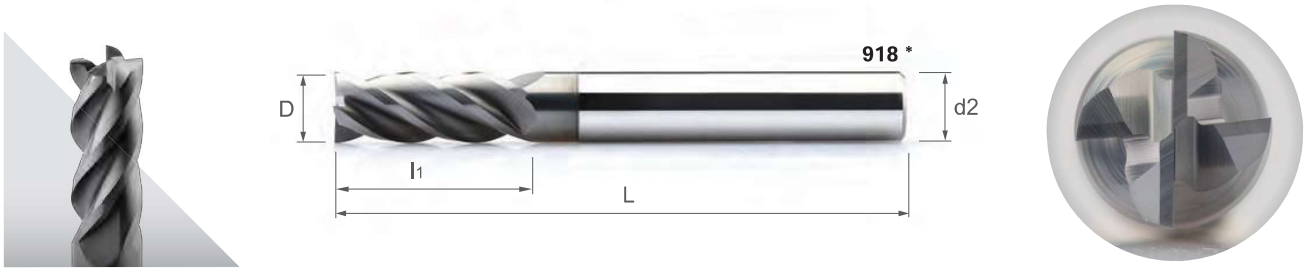
Tool Diameter : 6 mm
 Total Cutting Distance : 12 Meters
 Total Cutting Time : 0.5 Hours
 MRR (Q) : 19.44 cm³/min

After the 60th Layer (12 Meters)

STANDARD LINE		OPTIMUM LINE	
			
	Load = 23.0%		Load = 20.2%
	Avg. Flank Wear = 0.035 mm		Avg. Flank Wear = 0.024 mm
Much Improved Tool Life!			



Optimum Line DP Standard Endmill



EDPNo./EDV-Nr./ CODEusine/CodiceEDP	Dimension (mm)				918 *
	D	l1	L	d2 (h6)	H6110
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	50	3	●
0300 050 04	3	9	50	4	●
0300 050 06	3	9	50	6	●
0400	4	12	50	4	●
0400 050 06	4	12	50	6	●
0500	5	15	50	5	●
0500 050 06 15	5	15	50	6	●
0600 050 16	6	16	50	6	●
0600 060	6	20	60	6	●
0800 22	8	22	64	8	●
1000 075	10	22	75	10	●
1000 070 27	10	27	70	10	●
1200 075 32	12	32	75	12	●
1400	14	32	90	14	●
1600	16	32	90	16	●
1800	18	38	100	18	●
2000	20	38	100	20	●

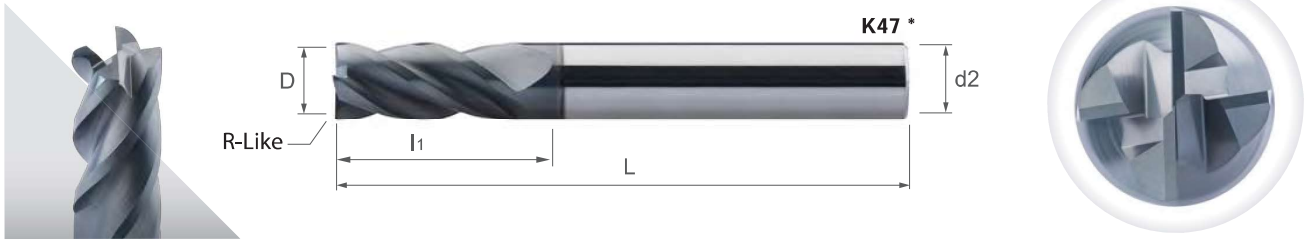
Material group - Material-Gruppe - Groupe matière - Gruppo materiali - 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O1	O2
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Working Material Cutting Parameter

TECHNICAL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

Optimum Line DP R-Like Endmill



EDPNo./EDV-Nr./ CODEusine/CodiceEDP	Dimension (mm)						K47 *	K38 *
	D	L1	L2	L	d2 (h6)	R-Like	HA	HB
=*+Ødata							H6110	H6110
0100 050 03	1	3		50	3	0.1	●	-
0150 050 03	1.5	4.5		50	3	0.1	●	-
0200 050 03	2	6.5		50	3	0.1	●	-
0250 050 03	2.5	6.5		50	3	0.1	●	-
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 050 06	4	12	20	50	6	0.1	●	●
0500	5	15	20	50	5	0.1	●	●
0500 050 06 15	5	15	20	50	6	0.1	●	●
0600 050 16	6	16	20	50	6	0.1	●	●
0600 060	6	20	30	60	6	0.1	●	●
0800 22	8	22	30	64	8	0.2	●	●
1000 075	10	22	32	75	10	0.2	●	●
1000 070 27	10	27	32	70	10	0.2	●	●
1200 075 32	12	32	37	75	12	0.2	●	●
1400	14	32	44	90	14	0.2	●	●
1600	16	32	46	90	16	0.2	●	●
2000	20	38	58	100	20	0.2	●	●

K52 * K53 *



R - Like is an enhanced edge protection.

Material group - Material-Gruppe - Groupe matière - Gruppo materiali - 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O1	O2
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Working Material Cutting Parameter

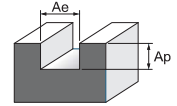
TECHNICAL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

Optimum Line Cutting Parameters

Ramping	P						M				K	
Work Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron	
Properties	320 < Rm < 880		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		520 < Rm < 1200	
Cutting Depth, Ap	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ramping angle	45°		45°		30°		15°		10°		45°	
Diameter, D	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	12700	850	11100	750	10100	650	9500	200	5300	100	13300	250
4	9500	900	8400	800	7600	700	7200	250	4000	100	9900	250
5	7600	950	6700	850	6000	750	5700	250	3200	100	8000	270
6	6400	950	5600	850	5000	750	4800	280	2700	100	6600	270
8	4800	1000	4200	900	3800	800	3600	280	2000	100	5000	280
10	3800	1050	3300	950	3000	850	2900	280	1600	110	4000	280
12	3200	1100	2800	1000	2500	900	2400	290	1300	110	3300	300
14	2700	1100	2400	1000	2200	900	2000	300	1100	110	2800	350
16	2400	1150	2100	1050	1900	950	1800	320	1000	150	2500	350
18	2100	1150	1900	1050	1700	950	1600	320	900	180	2200	380
20	1900	1200	1700	1100	1500	1000	1400	330	800	220	2000	380

Ramping	N				S	
Work Material	Wrought Aluminium		Cast Aluminium		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
Cutting Depth, Ap	1.00 × D		1.00 × D		1.00 × D	
Ramping angle	30°		45°		10°	
Diameter, D	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	15900	800	14300	700	6400	300
4	11900	800	10700	750	4800	300
5	9500	850	8600	800	3800	320
6	8000	850	7200	800	3200	320
8	6000	900	5400	850	2400	330
10	4800	900	4300	850	1900	330
12	4000	950	3600	900	1600	360
14	3400	950	3100	950	1400	360
16	3000	1000	2700	1000	1200	380
18	2700	1000	2400	1000	1100	380
20	2400	1050	2100	1050	1000	400

Optimum Line Cutting Parameters

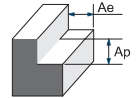


Slotting	P						M				K	
Work Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron	
Properties	320 < Rm < 880		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		520 < Rm < 1200	
Cutting Depth, Ap	0.60 × D		0.50 × D		0.50 × D		0.50 × D		0.30 × D		0.60 × D	
Cutting Width, Ae	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Diameter, D	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	20200	750	18600	650	12700	550	10100	300	5300	100	14900	300
4	15100	780	13900	680	9500	580	7600	350	4000	100	11100	300
5	12100	800	11100	700	7600	600	6000	350	3200	100	8900	310
6	10100	800	9300	700	6400	600	5000	380	2700	100	7400	310
8	7600	850	7000	750	4800	650	3800	380	2000	100	5600	320
10	6000	850	5600	750	3800	650	3000	400	1600	110	4500	320
12	5000	900	4600	800	3200	700	2500	450	1300	110	3700	340
14	4300	950	4000	850	2700	750	2200	480	1100	110	3200	360
16	3800	950	3500	850	2400	750	1900	500	1000	150	2800	360
18	3400	1000	3100	900	2100	800	1700	550	900	180	2500	400
20	3000	1000	2800	900	1900	800	1500	550	800	220	2200	400

Slotting	N				S	
Work Material	Wrought Aluminium		Cast Aluminium		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
Cutting Depth, Ap	0.80 × D		0.70 × D		0.30 × D	
Cutting Width, Ae	1.00 × D		1.00 × D		1.00 × D	
Diameter, D	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	26500	950	23300	850	6900	300
4	19900	950	17500	850	5200	300
5	15900	1000	14000	900	4100	320
6	13300	1000	11700	900	3400	320
8	9900	1050	8800	950	2600	330
10	8000	1050	7000	950	2100	330
12	6600	1100	5800	1000	1700	360
14	5700	1150	5000	1050	1500	360
16	5000	1150	4400	1050	1300	380
18	4400	1200	3900	1100	1100	380
20	4000	1200	3500	1100	1000	400



Optimum Line Cutting Parameters



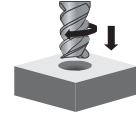
Side Milling	P						M				K	
Work Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron	
Properties	320 < Rm < 880		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		520 < Rm < 1200	
Cutting Depth, Ap	1.15 × D		1.00 × D		1.00 × D		1.00 × D		0.70 × D		1.00 × D	
Cutting Width, Ae	0.30 × D		0.30 × D		0.30 × D		0.30 × D		0.30 × D		0.30 × D	
Diameter, D	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
1	40000	750	40000	1300	40000	900	31800	280	15900	150	40000	1400
2	31800	780	29400	1400	22300	950	15900	280	8000	150	25500	1500
3	21200	800	19600	1450	14900	1000	10600	300	5300	160	17000	1600
4	15900	820	14700	1600	11100	1000	8000	300	4000	160	12700	1650
5	12700	850	11800	1600	8900	1100	6400	350	3200	170	10200	1700
6	10600	850	9800	1600	7400	1100	5300	350	2700	170	8500	1700
8	8000	900	7400	1800	5600	1250	4000	380	2000	180	6400	1800
10	6400	900	5900	1800	4500	1250	3200	380	1600	180	5100	1800
12	5300	950	4900	2000	3700	1400	2700	400	1300	200	4200	1870
14	4500	1000	4200	2100	3200	1500	2300	450	1100	220	3600	1950
16	4000	1000	3700	2100	2800	1550	2000	450	1000	220	3200	1950
18	3500	1050	3300	2200	2500	1650	1800	500	900	240	2800	2100
20	3200	1050	2900	2200	2200	1650	1600	550	800	240	2500	2100

Side Milling	N				S	
Work Material	Wrought Aluminium		Cast Aluminium		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
Cutting Depth, Ap	1.20 × D		1.00 × D		0.80 × D	
Cutting Width, Ae	0.30 × D		0.30 × D		0.30 × D	
Diameter, D	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
1	40000	900	40000	850	25500	650
2	40000	950	36600	850	12700	700
3	27600	1000	24400	900	8500	800
4	20700	1000	18300	900	6400	800
5	16600	1050	14600	950	5100	950
6	13800	1050	12200	950	4200	950
8	10300	1100	9200	1000	3200	1000
10	8300	1100	7300	1000	2500	1000
12	6900	1150	6100	1050	2100	1100
14	5900	1150	5200	1050	1800	1150
16	5200	1200	4600	1100	1600	1150
18	4600	1200	4100	1100	1400	1200
20	4100	1250	3700	1150	1300	1200

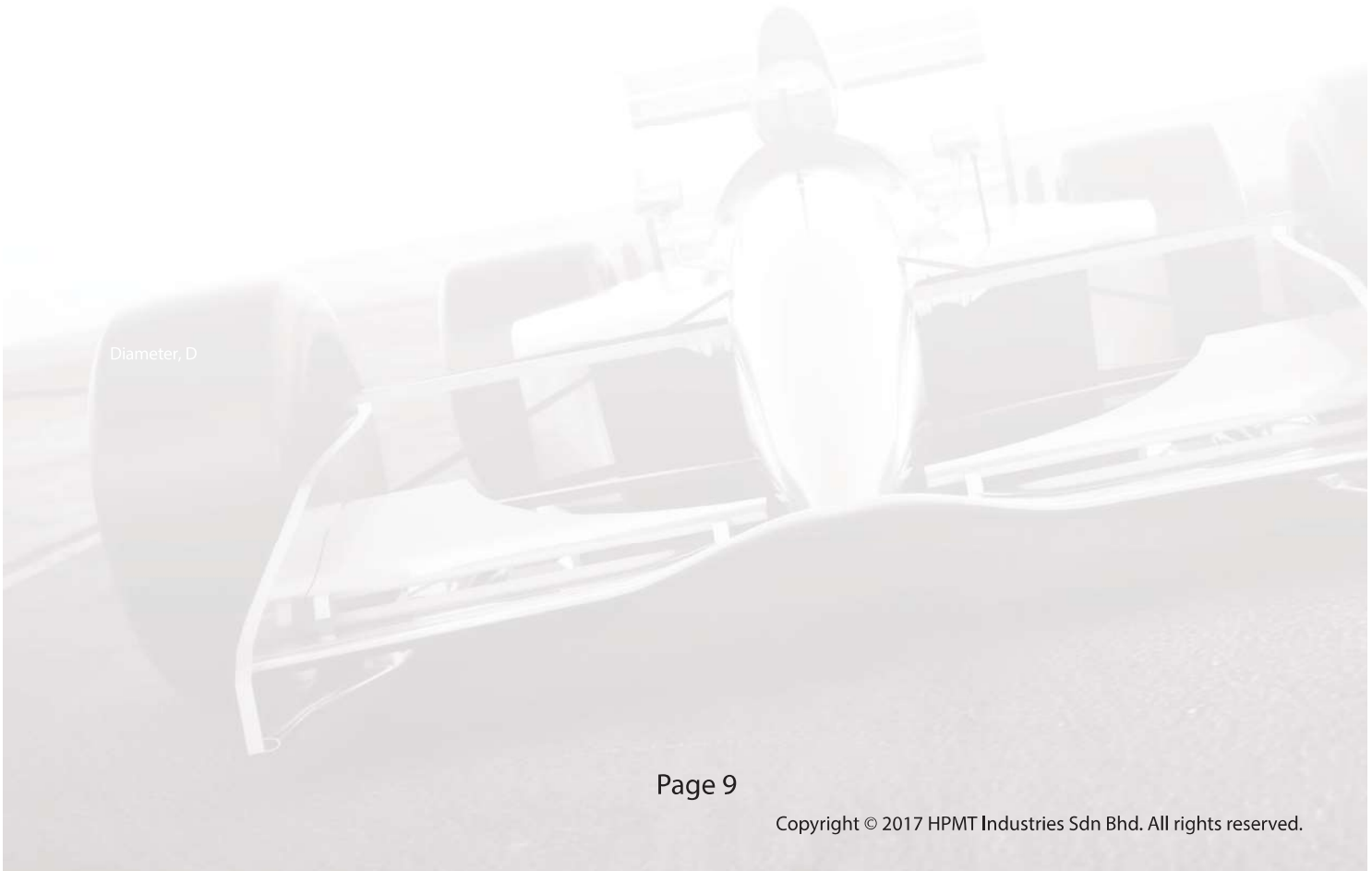




Optimum Line Cutting Parameters



Plunging	P						K		N			
Work Material	Carbon Steel		Alloy Steel		Prehardened Steel		Grey Cast Iron		Wrought Aluminium		Cast Aluminium	
Properties	320 < Rm < 880		520 < Rm < 1200		35 ≤ HRC < 45		520 < Rm < 1200		Si < 9%		Si ≥ 9%	
Cutting Depth, Ap	-		-		-		-		-		-	
Cutting Depth, Ae	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Diameter, D	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)	n (min ⁻¹)	Vf (mm/min)
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	13300	850	11700	750	10600	650	13300	250	16400	800	14900	700
4	9900	900	8800	800	8000	700	9900	250	12300	800	11100	750
5	8000	950	7000	850	6400	750	8000	270	9900	850	8900	800
6	6600	950	5800	850	5300	750	6600	270	8200	850	7400	800
8	5000	1000	4400	900	4000	800	5000	280	6200	900	5600	850
10	4000	1050	3500	950	3200	850	4000	280	4900	900	4500	850
12	3300	1100	2900	1000	2700	900	3300	300	4100	950	3700	900
14	2800	1100	2500	1000	2300	900	2800	350	3500	950	3200	950
16	2500	1150	2200	1050	2000	950	2500	350	3100	1000	2800	1000
18	2200	1150	1900	1050	1800	950	2200	380	2700	1000	2500	1000
20	2000	1200	1800	1100	1600	1000	2000	380	2500	1050	2200	1050



Diameter, D



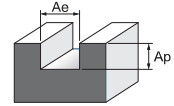
Optimum Line Cutting Parameters

Ramping	P						M				K	
Work Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron	
Properties	320 < Rm < 880		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		520 < Rm < 1200	
Cutting Depth, Ap	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Ramping angle	45°		45°		30°		15°		10°		45°	
Diameter, D	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	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	0.017	-	0.017	-	0.016	-	0.005	-	0.005	-	0.005
4	-	0.024	-	0.024	-	0.023	-	0.009	-	0.006	-	0.006
5	-	0.031	-	0.032	-	0.031	-	0.011	-	0.008	-	0.008
6	-	0.037	-	0.038	-	0.037	-	0.015	-	0.009	-	0.010
8	-	0.052	-	0.054	-	0.053	-	0.020	-	0.013	-	0.014
10	120	0.069	105	0.071	95	0.070	90	0.024	50	0.017	125	0.018
12	-	0.086	-	0.090	-	0.089	-	0.030	-	0.021	-	0.023
14	-	0.101	-	0.105	-	0.104	-	0.037	-	0.024	-	0.031
16	-	0.120	-	0.126	-	0.126	-	0.045	-	0.038	-	0.035
18	-	0.135	-	0.141	-	0.141	-	0.050	-	0.051	-	0.043
20	-	0.157	-	0.165	-	0.165	-	0.058	-	0.069	-	0.048

Ramping	N				S	
Work Material	Wrought Aluminium		Cast Aluminium		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
Cutting Depth, Ap	1.00 × D		1.00 × D		1.00 × D	
Ramping angle	30°		45°		10°	
Diameter, D	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	-	0.013	-	0.012	-	0.012
4	-	0.017	-	0.017	-	0.016
5	-	0.022	-	0.023	-	0.021
6	-	0.027	-	0.028	-	0.025
8	-	0.038	-	0.040	-	0.035
10	150	0.047	135	0.049	60	0.043
12	-	0.060	-	0.063	-	0.057
14	-	0.070	-	0.077	-	0.066
16	-	0.084	-	0.093	-	0.080
18	-	0.094	-	0.105	-	0.090
20	-	0.110	-	0.122	-	0.105



Optimum Line Cutting Parameters



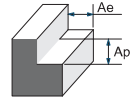
Slotting	P						M				K	
Work Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron	
Properties	320 < Rm < 880		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		520 < Rm < 1200	
Cutting Depth, Ap	0.60 × D		0.50 × D		0.50 × D		0.50 × D		0.30 × D		0.60 × D	
Cutting Depth, Ae	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Diameter, D	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	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	0.009	-	0.009	-	0.011	-	0.007	-	0.005	-	0.005
4	-	0.013	-	0.012	-	0.015	-	0.012	-	0.006	-	0.007
5	-	0.017	-	0.016	-	0.020	-	0.014	-	0.008	-	0.009
6	-	0.020	-	0.019	-	0.024	-	0.019	-	0.009	-	0.010
8	-	0.028	-	0.027	-	0.034	-	0.025	-	0.013	-	0.014
10	190	0.035	175	0.034	120	0.043	95	0.033	50	0.017	140	0.018
12	-	0.045	-	0.043	-	0.055	-	0.045	-	0.021	-	0.023
14	-	0.055	-	0.053	-	0.069	-	0.056	-	0.024	-	0.028
16	-	0.063	-	0.061	-	0.079	-	0.066	-	0.038	-	0.032
18	-	0.074	-	0.073	-	0.094	-	0.082	-	0.051	-	0.040
20	-	0.083	-	0.081	-	0.105	-	0.091	-	0.069	-	0.045

Slotting	N				S	
Work Material	Wrought Aluminium		Cast Aluminium		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
Cutting Depth, Ap	0.80 × D		0.70 × D		0.30 × D	
Cutting Depth, Ae	1.00 × D		1.00 × D		1.00 × D	
Diameter, D	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	-	0.009	-	0.009	-	0.011
4	-	0.012	-	0.012	-	0.015
5	-	0.016	-	0.016	-	0.019
6	-	0.019	-	0.019	-	0.023
8	-	0.026	-	0.027	-	0.032
10	250	0.033	220	0.034	65	0.040
12	-	0.041	-	0.043	-	0.052
14	-	0.051	-	0.052	-	0.061
16	-	0.058	-	0.060	-	0.073
18	-	0.068	-	0.071	-	0.083
20	-	0.075	-	0.079	-	0.097





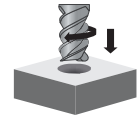
Optimum Line Cutting Parameters



Side Milling	P						M				K	
Work Material	Carbon Steel		Alloy Steel		Prehardened Steel		Stainless Steel		Stainless Steel		Grey Cast Iron	
Properties	320 < Rm < 880		520 < Rm < 1200		35 ≤ HRC < 45		High Machinability		Low Machinability		520 < Rm < 1200	
Cutting Depth, Ap	1.15 × D		1.00 × D		1.00 × D		1.00 × D		0.70 × D		1.00 × D	
Cutting Depth, Ae	0.30 × D		0.30 × D		0.30 × D		0.30 × D		0.30 × D		0.30 × D	
Diameter, D	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		0.006		0.005		0.002		0.002		0.007
2		0.006		0.012		0.011		0.004		0.005		0.015
3		0.009		0.018		0.017		0.007		0.008		0.024
4		0.013		0.027		0.022		0.009		0.010		0.032
5		0.017		0.034		0.031		0.014		0.013		0.042
6		0.020		0.041		0.037		0.016		0.016		0.050
8	200	0.028	185	0.061	140	0.056	100	0.024	50	0.023	160	0.071
10		0.035		0.076		0.070		0.030		0.028		0.088
12		0.045		0.102		0.094		0.038		0.038		0.110
14		0.055		0.125		0.118		0.049		0.048		0.134
16		0.063		0.143		0.139		0.057		0.055		0.153
18		0.074		0.168		0.167		0.071		0.068		0.186
20		0.082		0.187		0.185		0.086		0.075		0.206

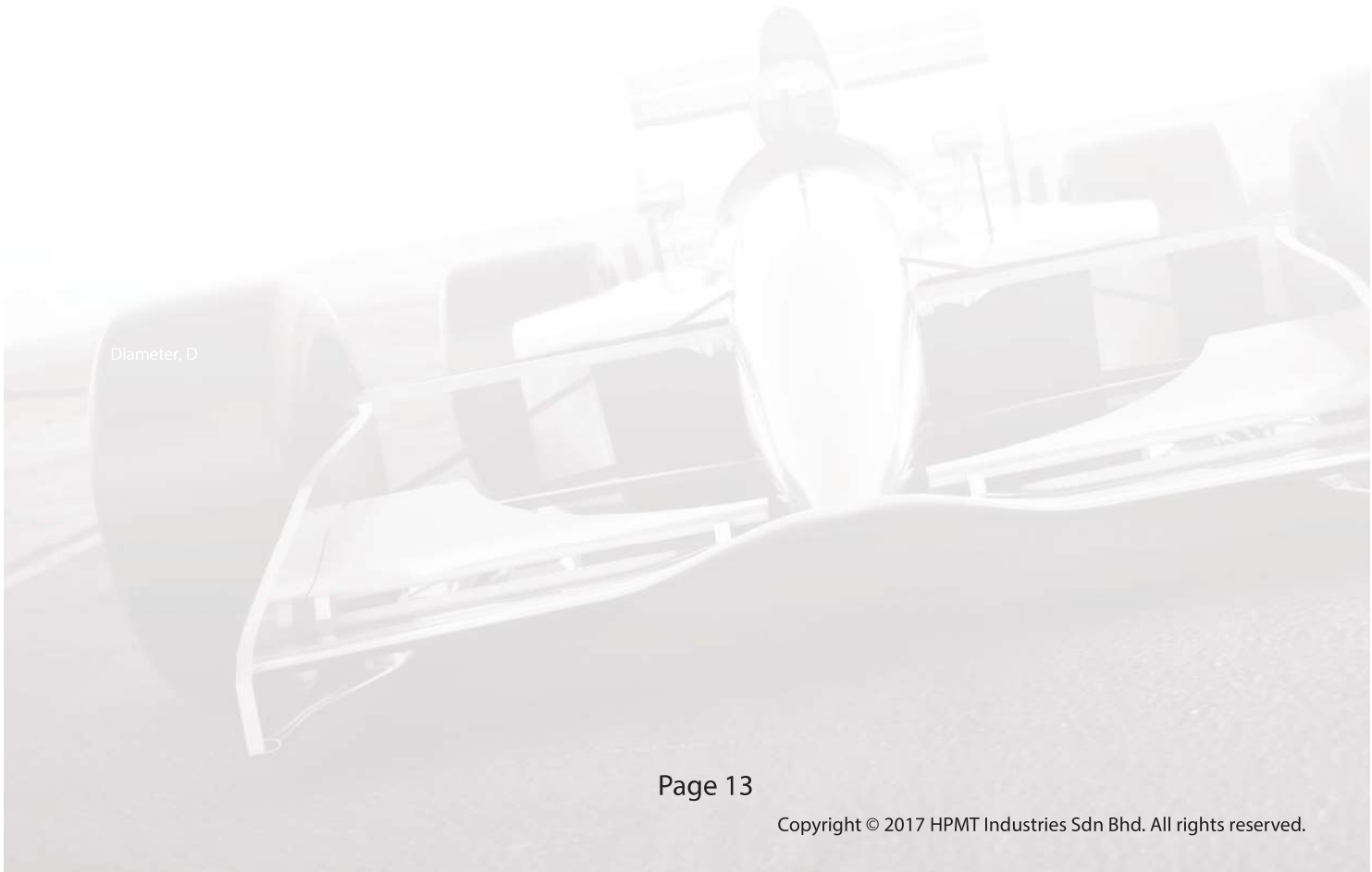
Side Milling	N				S	
Work Material	Wrought Aluminium		Cast Aluminium		Titanium Alloy	
Properties	Si < 9%		Si ≥ 9%		-	
Cutting Depth, Ap	1.20 × D		1.10 × D		0.80 × D	
Cutting Depth, Ae	0.30 × D		0.30 × D		0.30 × D	
Diameter, D	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)	Vc (m/min)	Fz (mm)
1		0.003		0.003		0.006
2		0.006		0.006		0.014
3		0.009		0.009		0.024
4		0.012		0.012		0.031
5		0.016		0.016		0.047
6		0.019		0.019		0.056
8	260	0.027	230	0.027	65	0.079
10		0.033		0.034		0.098
12		0.042		0.043		0.130
14		0.049		0.050		0.158
16		0.058		0.060		0.181
18		0.065		0.068		0.212
20		0.076		0.079		0.236





Optimum Line Cutting Parameters

Plunging	P						K		N			
Work Material	Carbon Steel		Alloy Steel		Prehardened Steel		Grey Cast Iron		Wrought Aluminium		Cast Aluminium	
Properties	320 < Rm < 880		520 < Rm < 1200		35 ≤ HRC < 45		520 < Rm < 1200		Si < 9%		Si ≥ 9%	
Cutting Depth, Ap	-		-		-		-		-		-	
Cutting Depth, Ae	1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D		1.00 × D	
Diameter, D	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	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3		0.016		0.016		0.015		0.005		0.012		0.012
4		0.023		0.023		0.022		0.006		0.016		0.017
5		0.030		0.030		0.029		0.008		0.022		0.022
6		0.036		0.036		0.035		0.010		0.026		0.027
8		0.050		0.051		0.050		0.014		0.036		0.038
10	125	0.066	110	0.068	100	0.067	125	0.018	155	0.046	140	0.048
12		0.083		0.086		0.085		0.023		0.058		0.061
14		0.097		0.100		0.099		0.031		0.067		0.075
16		0.116		0.120		0.119		0.035		0.081		0.090
18		0.130		0.135		0.134		0.043		0.091		0.101
20		0.151		0.157		0.157		0.048		0.106		0.118



Diameter, D





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