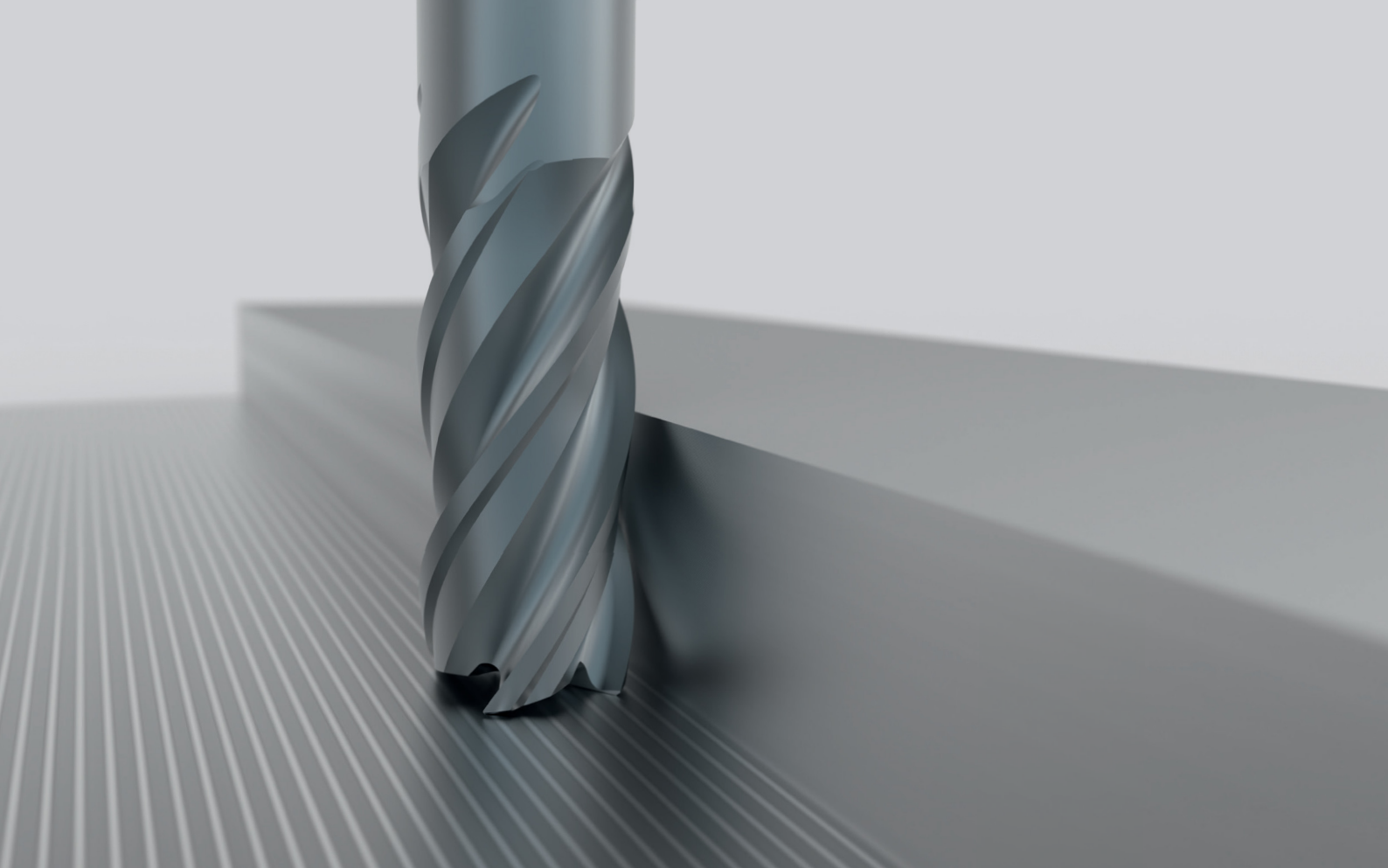


HPC – High Performance Cutter

Our Series for the Highest
Productivity Requirements

www.lmt-tools.com

LMT•TOOLS
BELIN
FETTE
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ONSRUD



Full Power With HPC Maximum Tool Life and Productivity

The new HPC family combines the proven tool series DHC Premium, DHC INOX Premium, DHC Slot and DHC Hardline under one roof. As a high-performance program, it offers numerous advantages for a wide range of applications. The improved technology and increased productivity provide users with a clear performance advantage. Machining with HPC is ideal for trochoidal, edge, corner and slot milling as well as ramping up to 0.5 x diameter.

By optimizing the production processes and using the latest coating technologies, both tool life and productivity have been significantly increased. With its various cutting edge lengths and diameters, the HPC family can meet a wide range of requirements. Discover the advantages of the HPC family and experience the full performance of LMT Tools.

Our High-Performance Program for Diverse Materials

The HPC family is designed for a wide range of applications: From machining higher alloy steels, cast and austenitic materials to machining high-strength materials up to 1600 N/mm² and hardened steel up to 55 HRC. The uneven pitch ensures maximum smoothness and process reliability, while obtaining great surface quality of the machined workpieces

Your advantages:

- Great surface quality of the machined workpieces
- Tool life increase of up to 70% compared to proven products of previous families

Cylindrical shank: With and without clamping surface, Safe torque transmission and high balancing quality

Neck relief

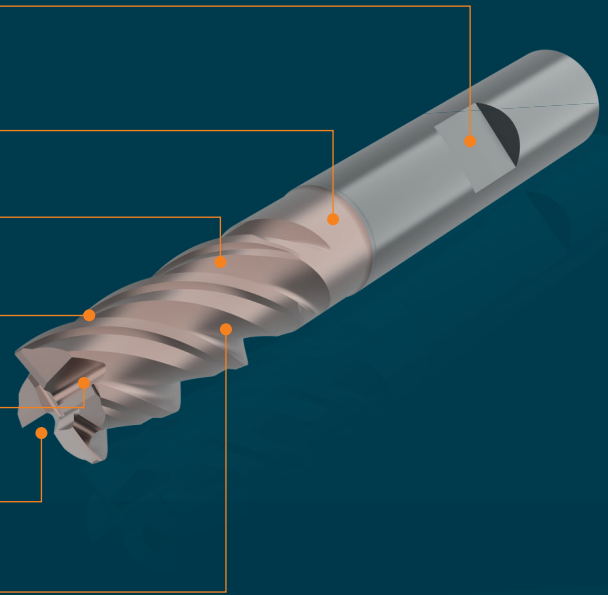
Micro edge preparation


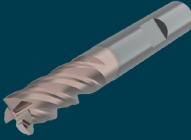
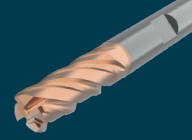
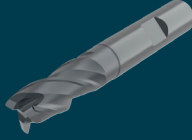








Smooth running due to different helix angles

Cross center cutting, also suitable for diagonal plunging

Optimized flute clearance for better chip removal

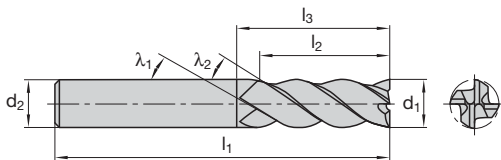
State-of-the-art coating



HPC P	HPC M	HPC H	HPC U
			
For high alloy steels and cast iron	For austenitic steels, non-ferrous metals and titanium	For hardened steels ≤ 45 to 55 HRC	Full flute milling cutter with large chip removal space for universal application
P K	M S Second choice: N	H P Second choice: K	P M K N S
			
Corner Milling	Slotting	Contour Milling	Pocket Milling
			
Ramping	Circular Milling	Trochoidal Milling	Roughing and Finishing

HPC01 Rougher 35/38P

High Performance Cutter for high carbon steel and cast iron



Cat.-No.		HPC01-P-A				HPC01-P-B			
P		■				■			
M									
K		■				■			
N									
S									
H									
O									
d ₁	l ₂	l ₁	l ₃	d ₂	z	Ident No.	LMT-Code	Ident No.	LMT-Code
short									
1	1.5	40	2	4	4	7426037	EM-HPC01 P1.0x1.5/2 4C0.025HA	–	–
2	3	40	4	4	4	7426038	EM-HPC01 P2.0x3/4 4C0.05HA	–	–
3	4	40	6	4	4	7426039	EM-HPC01 P3.0x4/6 4C0.075HA	–	–
4	5	54	8	6	4	7426069	EM-HPC01 P4.0x5/8 4C0.1HA	7426040	EM-HPC01 P4.0x5/8 4C0.1HB
5	6	54	10	6	4	7426070	EM-HPC01 P5.0x6/10 4C0.15HA	7426041	EM-HPC01 P5.0x6/10 4C0.15HB
6	7	54	16	6	4	7426071	EM-HPC01 P6.0x7/16 4C0.2HA	7426042	EM-HPC01 P6.0x7/16 4C0.2HB
8	9	58	20	8	4	7426072	EM-HPC01 P8.0x9/20 4C0.2HA	7426043	EM-HPC01 P8.0x9/20 4C0.2HB
10	11	66	24	10	4	7426073	EM-HPC01 P10.0x11/24 4C0.2HA	7426044	EM-HPC01 P10.0x11/24 4C0.2HB
12	12	73	26	12	4	7426074	EM-HPC01 P12.0x12/26 4C0.2HA	7426045	EM-HPC01 P12.0x12/26 4C0.2HB
14	14	75	28	14	4	7426075	EM-HPC01 P14.0x14/28 4C0.3HA	7426046	EM-HPC01 P14.0x14/28 4C0.3HB
16	16	82	32	16	4	7426076	EM-HPC01 P16.0x16/32 4C0.3HA	7426047	EM-HPC01 P16.0x16/32 4C0.3HB
18	18	84	34	18	4	7426077	EM-HPC01 P18.0x18/34 4C0.3HA	7426048	EM-HPC01 P18.0x18/34 4C0.3HB
20	20	92	40	20	4	7426078	EM-HPC01 P20.0x20/40 4C0.3HA	7426049	EM-HPC01 P20.0x20/40 4C0.3HB
long									
1	2.5	40	3	4	4	7426050	EM-HPC01 P1.0x2.5/3 4C0.025HA	–	–
2	4	40	6	4	4	7426051	EM-HPC01 P2.0x4/6 4C0.05HA	–	–
3	6	40	9	4	4	7426052	EM-HPC01 P3.0x6/9 4C0.075HA	–	–
4	8	54	12	6	4	7426079	EM-HPC01 P4.0x8/12 4C0.1HA	7426053	EM-HPC01 P4.0x8/12 4C0.1HB
5	10	54	15	6	4	7426080	EM-HPC01 P5.0x10/15 4C0.15HA	7426054	EM-HPC01 P5.0x10/15 4C0.15HB
6	13	57	21	6	4	7426081	EM-HPC01 P6.0x13/21 4C0.2HA	7426055	EM-HPC01 P6.0x13/21 4C0.2HB
8	19	63	27	8	4	7426082	EM-HPC01 P8.0x19/27 4C0.2HA	7426056	EM-HPC01 P8.0x19/27 4C0.2HB
10	22	72	32	10	4	7426083	EM-HPC01 P10.0x22/32 4C0.2HA	7426057	EM-HPC01 P10.0x22/32 4C0.2HB
12	26	83	38	12	4	7426084	EM-HPC01 P12.0x26/38 4C0.2HA	7426058	EM-HPC01 P12.0x26/38 4C0.2HB
14	26	83	38	14	4	7426085	EM-HPC01 P14.0x26/38 4C0.3HA	7426059	EM-HPC01 P14.0x26/38 4C0.3HB
16	32	92	44	16	4	7426086	EM-HPC01 P16.0x32/44 4C0.3HA	7426060	EM-HPC01 P16.0x32/44 4C0.3HB
18	32	92	44	18	4	7426087	EM-HPC01 P18.0x32/44 4C0.3HA	7426061	EM-HPC01 P18.0x32/44 4C0.3HB
20	38	104	54	20	4	7426088	EM-HPC01 P20.0x38/54 4C0.3HA	7426062	EM-HPC01 P20.0x38/54 4C0.3HB

■ = First Choice
□ = Second choice

Edge protection chamfer	d ₁	b
	1	0.025
	2	0.05
	3	0.075
	4	0.1
	5	0.15
	6–12	0.2
	14–20	0.3

Cutting data recommendations starting page 6

HPC01 Rougher 35/38P
High Performance Cutter for high carbon steel and cast iron



Cat.-No.						HPC01-P-A		HPC01-P-B	
P						■		■	
M									
K						■		■	
N									
S									
H									
O									
d ₁	l ₂	l ₁	l ₃	d ₂	z	Ident No.	LMT-Code	Ident No.	LMT-Code
extra long									
6	9	65	29	6	4	7426089	EM-HPC01 P6.0x9/29 4C0.2HA	7426063	EM-HPC01 P6.0x9/29 4C0.2HB
8	12	75	39	8	4	7426090	EM-HPC01 P8.0x12/39 4C0.2HA	7426064	EM-HPC01 P8.0x12/39 4C0.2HB
10	15	80	40	10	4	7426091	EM-HPC01 P10.0x15/40 4C0.2HA	7426065	EM-HPC01 P10.0x15/40 4C0.2HB
12	18	93	48	12	4	7426092	EM-HPC01 P12.0x18/48 4C0.2HA	7426066	EM-HPC01 P12.0x18/48 4C0.2HB
16	24	108	60	16	4	7426093	EM-HPC01 P16.0x24/60 4C0.3HA	7426067	EM-HPC01 P16.0x24/60 4C0.3HB
20	30	126	76	20	4	7426094	EM-HPC01 P20.0x30/76 4C0.3HA	7426068	EM-HPC01 P20.0x30/76 4C0.3HB





■ = First Choice
 □ = Second choice


Edge protection chamfer	d ₁	b
	1	0.025
	2	0.05
	3	0.075
	4	0.1
	5	0.15
	6-12	0.2
	14-20	0.3


Cutting data recommendations starting page 6

HPC01 Rougher 35/38P

Cutting data recommendations

Material	Material No.	DIN Description Old	R _m /UTS (N/mm ²)	DIN Description New	Coolant	
P Plain carbon steel + free cutting steel	1.0570	St52-3	-700	S355J2G3	 	
	1.1730	C45	-800	C45U		
	1.0715	9SMn28	-700	11SMn30		
	1.1191	Ck45	500-950	C45E		
	1.7219	26CrMo4		26CrMo4-2		
	Heat-treatment steel, medium strength	1.7225	42CrMo4	500-950		42CrMo4
		1.8159	51CrV4			51CrV4
	Cast steel	1.0416	GS40	-950		GS40
	Case hardening steel	1.7131	16MnCr5	-950		16MnCr5
		1.4006	X10Cr13	500-950		X12Cr13
	1.4104	X12CrMoS17	X14CrMoS17			
	1.4122	X35CrMo17	X39CrMo17-1			
	Heat-treatment steel, high strength	1.7225	42CrMo4	950-1400		42CrMo4
		1.6580	30CrNiMo8			30CrNiMo8
	Nitriding steel, heat treated	1.8504	34CrAl6	950-1400		34CrAl6
		1.2344	X40CrMoV5.1	-900		X40CrMoV5-1
Tool steel	1.2379	X155CrVMo12 1	240-350 HB	X153CrMoV12-1		
	1.2080	X210Cr12		X210Cr12		
	1.2343	X38CrMoV5 1	950-1400	X37CrMoV5-1		
	1.2358	60CrMoV18-5	850-1000	60CrMoV18-5		
	1.2714	55NiCrMoV7	1100-1350	55NiCrMoV7		
	1.2311	40CrMnMo7	-1100	40CrMnMo7		
	1.2312	40CrMnNiMoS8.6	-1150	40CrMnNiMoS8-6		
	1.2316	X38CrMo16	-1100	X38CrMo16		
1.2738	45CrMnNiMo8.6.4	950-1150	45CrMnNiMo8-6-4			
K Grey cast iron	0.6025	GG25	100-400 (120-260 HB)	EN-GJI-250	 	
	Alloyed grey cast iron	0.6678	GGL-NiCr35 2 (160-230 HB)	EN-GJLA-XNiCr35-2		
				EN-GJS-600-3		
	Nodular cast iron	0.7060 0.7070	GGG60 GGG70L (120-310 HB)	400-800 (120-310 HB)		EN-GJS-700-2U
Malleable cast iron	0.8155	GTS55	350-700 (150-280 HB)	EN-GJMB-550-4		

 Dry machining,
air-blast cooling is advantageous

 Wet machining,
sufficient emulsion volume required

Calculation formulas and feed correction factors

Speed n (min ⁻¹): $n = \frac{v_c \cdot 1000}{\pi \cdot d_1}$	Feed correction f ₁				
	a _e	a _p	HPC01-P short f ₁	HPC01-P long f ₁	HPC01-P extra long ³⁾ f ₁
Feed rate in v _f (mm/min): $v_f = f_z \cdot z \cdot n \cdot f_1$	0.1 · d ₁	1 × d ₁	2.4	2.2	1.6
		1.5 × d ₁	–	2	1.5
		2 × d ₁ ²⁾	–	1.6	–
	0.25 · d ₁	1 × d ₁	2.1	1.6	1.1
		1.5 × d ₁	–	1.4	1
		2 × d ₁ ²⁾	–	1.2	–
0.5 · d ₁	1 × d ₁	1.6	1.2	0.7	
	1.5 × d ₁	–	1	0.6	
	2 × d ₁ ²⁾	–	0.8	–	
0.75 · d ₁	1 × d ₁	1.1	0.8	0.5	
	1.5 × d ₁	–	0.7	0.4	
	2 × d ₁ ²⁾	–	0.6	–	
1 · d ₁ ¹⁾	0.5 × d ₁	0.8	0.6	0.5	
	1 × d ₁	–	0.5	0.4	
	2 × d ₁ ²⁾	–	0.4	–	

¹⁾ For diameter 1 to 3: long version and a_e = d₁ should not cross over a_p 0.5 x d₁

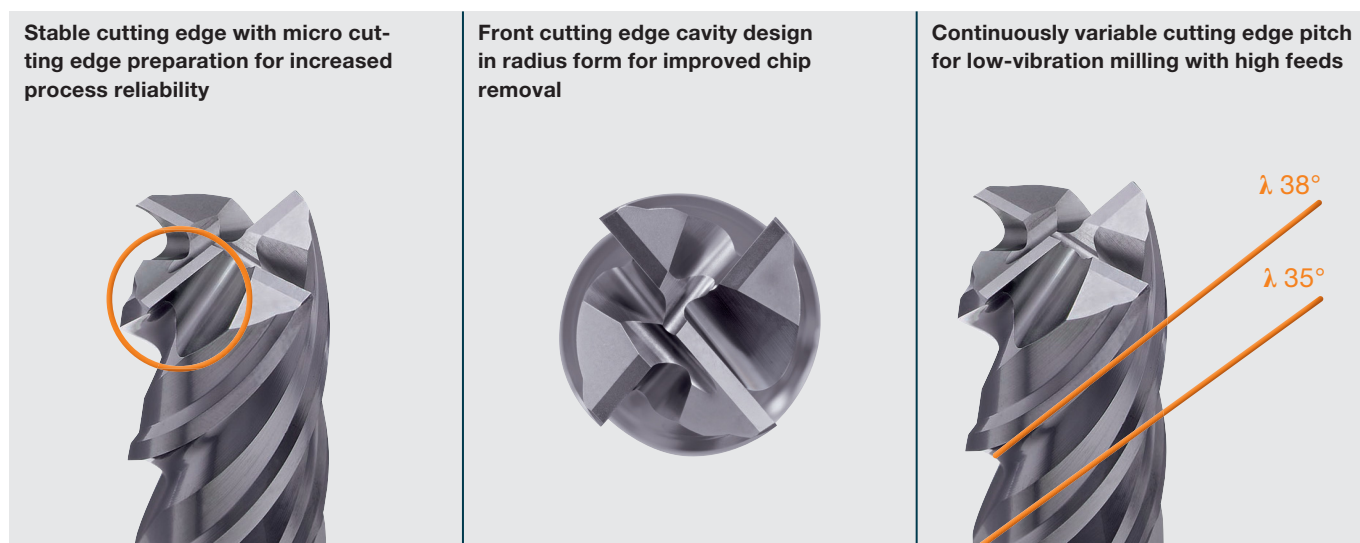
²⁾ 1.8 x d₁ for diameter 14, 18, 20

³⁾ Reduce extra long tools cutting speed by 20 %

Cutting speed v_c (m/min)	Cutting diameter (mm)											
	Feed per tooth f_z (mm/z.)											
	1 ¹⁾	2 ¹⁾	3 ¹⁾	4	5	6	8	10	12	14-16	18-20	
230-275	0.008	0.016	0.025	0.05	0.06	0.07	0.10	0.12	0.14	0.19	0.24	
230-275	0.008	0.016	0.025	0.05	0.06	0.07	0.10	0.12	0.14	0.19	0.24	
200-240	0.008	0.014	0.02	0.04	0.06	0.07	0.09	0.11	0.13	0.18	0.22	
200-240	0.008	0.014	0.02	0.04	0.06	0.07	0.09	0.11	0.13	0.18	0.22	
160-200	0.008	0.014	0.02	0.04	0.06	0.07	0.09	0.11	0.13	0.18	0.22	
120-150	0.008	0.014	0.02	0.04	0.05	0.06	0.08	0.10	0.11	0.15	0.19	
140-180	0.008	0.014	0.02	0.04	0.05	0.06	0.08	0.10	0.11	0.15	0.19	
140-180	0.008	0.014	0.02	0.04	0.05	0.06	0.08	0.10	0.11	0.15	0.19	
110-140	0.005	0.013	0.02	0.03	0.04	0.05	0.07	0.09	0.10	0.14	0.17	
100-120	0.005	0.013	0.02	0.03	0.04	0.05	0.07	0.09	0.10	0.14	0.17	
100-120	0.005	0.013	0.02	0.03	0.04	0.05	0.06	0.08	0.10	0.13	0.16	
180-220	0.012	0.025	0.04	0.06	0.08	0.09	0.12	0.15	0.18	0.22	0.28	
160-180	0.011	0.021	0.03	0.06	0.07	0.08	0.11	0.13	0.16	0.20	0.26	
150-180	0.01	0.02	0.03	0.05	0.06	0.07	0.10	0.12	0.14	0.19	0.24	
120-150	0.01	0.018	0.025	0.05	0.06	0.07	0.10	0.12	0.14	0.19	0.24	

The cutting data indicated are starting values and must be adjusted to the prevailing conditions.

Features of the HPC01 Rougher 35/38P



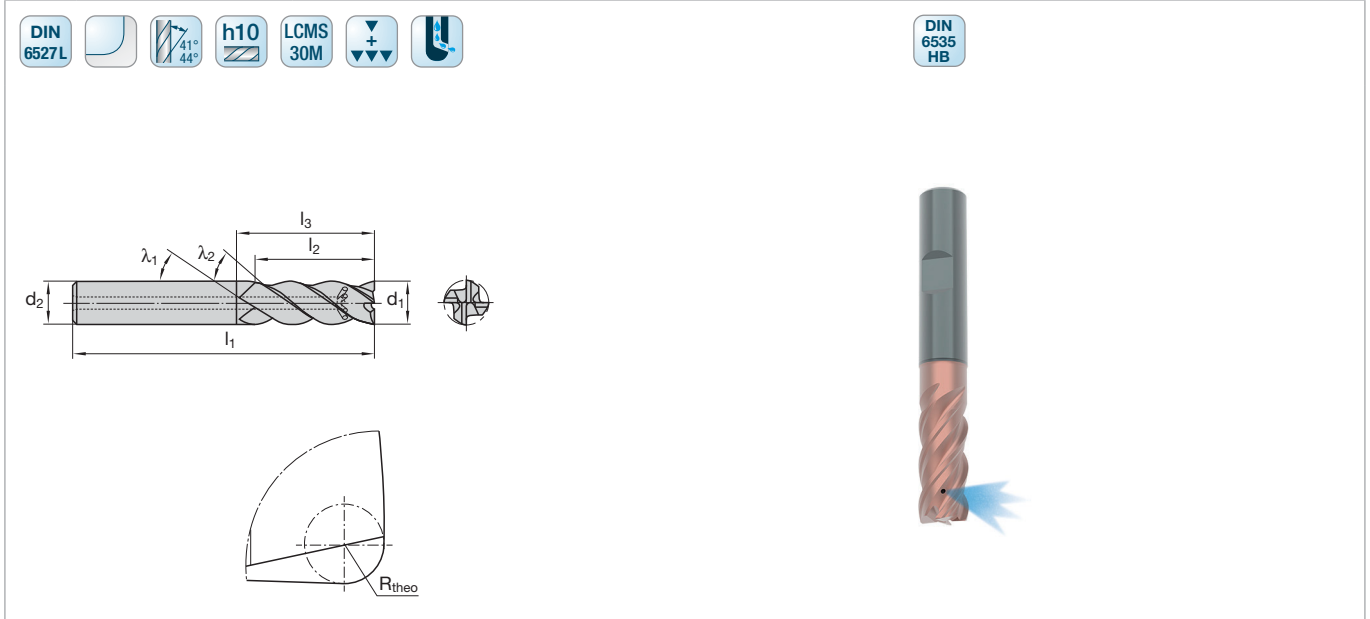
HPC01 Rougher 41/44M
High Performance Cutter for stainless steels, non-ferrous and titanium

Cat.-No.							HPC01-M-A	HPC01-M-B		
P										
M							■	■		
K										
N							□	□		
S							■	■		
H										
O										
d ₁	l ₂	l ₁	l ₃	d ₂	R _{theo} (+ 0.05)	z	Ident No.	LMT-Code	Ident No.	LMT-Code
short										
4	5	54	8	6	0.15	4	7426779	EM-HPC01 M4.0x5/8 4R0.15HA	7426788	EM-HPC01 M4.0x5/8 4R0.15HB
5	6	54	10	6	0.2	4	7426780	EM-HPC01 M5.0x6/10 4R0.2HA	7426789	EM-HPC01 M5.0x6/10 4R0.2HB
6	7	54	16	6	0.3	4	7426781	EM-HPC01 M6.0x7/16 4R0.3HA	7426790	EM-HPC01 M6.0x7/16 4R0.3HB
8	9	58	20	8	0.3	4	7426782	EM-HPC01 M8.0x9/20 4R0.3HA	7426791	EM-HPC01 M8.0x9/20 4R0.3HB
10	11	66	24	10	0.3	4	7426783	EM-HPC01 M10.0x11/24 4R0.3HA	7426792	EM-HPC01 M10.0x11/24 4R0.3HB
12	12	73	26	12	0.3	4	7426784	EM-HPC01 M12.0x12/26 4R0.3HA	7426793	EM-HPC01 M12.0x12/26 4R0.3HB
14	14	75	28	14	0.4	4	7426785	EM-HPC01 M14.0x14/28 4R0.4HA	7432295	EM-HPC01 M14.0x14/28 4R0.4HB
16	16	82	32	16	0.4	4	7426786	EM-HPC01 M16.0x16/32 4R0.4HA	7426794	EM-HPC01 M16.0x16/32 4R0.4HB
18	18	84	34	18	0.4	4	7432294	EM-HPC01 M18.0x18/34 4R0.4HA	7432296	EM-HPC01 M18.0x18/34 4R0.4HB
20	20	92	40	20	0.4	4	7426787	EM-HPC01 M20.0x20/40 4R0.4HA	7426795	EM-HPC01 M20.0x20/40 4R0.4HB
long										
4	8	54	12	6	0.15	4	7426796	EM-HPC01 M4.0x8/12 4R0.15HA	7426805	EM-HPC01 M4.0x8/12 4R0.15HB
5	10	54	15	6	0.2	4	7426797	EM-HPC01 M5.0x10/15 4R0.2HA	7426806	EM-HPC01 M5.0x10/15 4R0.2HB
6	13	57	21	6	0.3	4	7426798	EM-HPC01 M6.0x13/21 4R0.3HA	7426807	EM-HPC01 M6.0x13/21 4R0.3HB
8	19	63	27	8	0.3	4	7426799	EM-HPC01 M8.0x19/27 4R0.3HA	7426808	EM-HPC01 M8.0x19/27 4R0.3HB
10	22	72	32	10	0.3	4	7426800	EM-HPC01 M10.0x22/32 4R0.3HA	7426809	EM-HPC01 M10.0x22/32 4R0.3HB
12	26	83	38	12	0.3	4	7426801	EM-HPC01 M12.0x26/38 4R0.3HA	7426810	EM-HPC01 M12.0x26/38 4R0.3HB
14	26	83	38	14	0.4	4	7426802	EM-HPC01 M14.0x26/38 4R0.4HA	7432298	EM-HPC01 M14.0x26/38 4R0.4HB
16	32	92	44	16	0.4	4	7426803	EM-HPC01 M16.0x32/44 4R0.4HA	7426811	EM-HPC01 M16.0x32/44 4R0.4HB
18	32	92	44	18	0.4	4	7432297	EM-HPC01 M18.0x32/44 4R0.4HA	7432299	EM-HPC01 M18.0x32/44 4R0.4HB
20	38	104	54	20	0.4	4	7426804	EM-HPC01 M20.0x38/54 4R0.4HA	7426812	EM-HPC01 M20.0x38/54 4R0.4HB

Cutting data recommendations starting page 10

■ = First Choice
 □ = Second choice

HPC01 Rougher 41/44M
High Performance Cutter for stainless steels, non-ferrous and titanium




Cat.-No.		HPC01-M-B						
P								
M		■						
K								
N		■						
S		■						
H								
O								
d ₁	l ₂	l ₁	l ₃	d ₂	R _{theo} (+ 0.05)	z	Ident No.	LMT-Code
long								
6	13	57	21	6	0.3	4	7426813	EM-HPC01 M6.0x13/21 4R0.3HB-I
8	19	63	27	8	0.3	4	7426814	EM-HPC01 M8.0x19/27 4R0.3HB-I
10	22	72	32	10	0.3	4	7426815	EM-HPC01 M10.0x22/32 4R0.3HB-I
12	26	83	38	12	0.3	4	7426816	EM-HPC01 M12.0x26/38 4R0.3HB-I
16	32	92	44	16	0.4	4	7426817	EM-HPC01 M16.0x32/44 4R0.4HB-I
20	38	104	54	20	0.4	4	7426818	EM-HPC01 M20.0x38/54 4R0.4HB-I


Cutting data recommendations starting page 10


■ = First Choice
 □ = Second choice

HPC01 Rougher 41/44M

Cutting data recommendations

Material	Material No.	DIN Description Old	R _m /UTS (N/mm ²)	DIN Description New	Coolant	
M Stainless steel, austenitic	1.4301	X2CrNiMo17-12-2	500–950	X5CrNiMo18-10		
	1.4404	X6CrNiMoTi17-12-2		X2CrNiMo17-12-2		
	1.4571	X10CrNiMoTi18		X10CrNiMoTi18		
	Stainless steel, ferritic, martensitic	1.4024	X15Cr13	500–950		X15Cr13
		1.4057	X17CrNi16-2			X17CrNi16-2
		1.4122	X35CrMo17			X35CrMo17
Stainless steel, martensitic steel	1.2709	X3NiCoMoTi18-9-5	800–1000	X3NiCoMoTi18-9-5		
	1.4542	X5CrNiCuNb16-4		X5CrNiCuNb16-4		
	1.4568	X7CrNiAl17-7		X7CrNiAl17-7		
N Aluminium alloys, short chipping	3.2581	G-AISI12	-400	G-IGK-AISI12		
	Copper alloys, short chipping	2.0402	MS58	-500	CuZn40Pb2	
S Titanium alloys, medium strength	3.7164	TiAl6V4	-950	Ti6AlV4		
	3.7115	TiAl5Sn2.5		TiAl5Sn2-5		
	Titanium alloys, high strength	3.7174	TiAl6Sn2	900–1400	TiAl6V6Sn2	
	Nickel based alloys, medium strength	2.4670	NiCr12Al6MoNb	-950	NiCr12Al6MoNb	
	Heat resistant nickel based alloys, high strength	2.4668	NiCr19Fe19NbMo	900–1400	Inconel 718 NiCr19Fe19Nb5Mo3	

 Dry machining, air-blast cooling is advantageous

 Wet machining, sufficient emulsion volume required

Calculation formula and feed correction factors

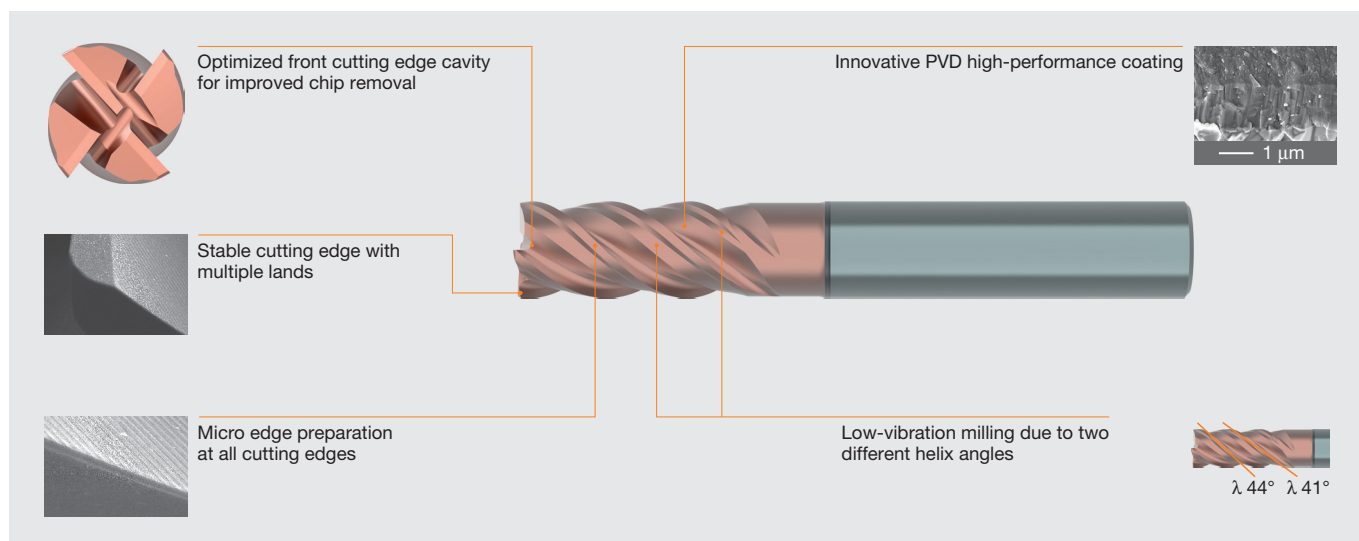
Speed n (min ⁻¹): $n = \frac{v_c \cdot 1000}{\pi \cdot d_1}$	Feed correction f_1				v_c
	a_e	a_p	HPC01-M short f_1	HPC01-M long f_1	
Feed rate v_f (mm/min): $v_f = f_z \cdot z \cdot n \cdot f_1$	0.1 · d ₁	1 x d ₁	2	1.8	increase by 30 %
		1.5 x d ₁	–	1.7	
		2 x d ₁ ¹⁾	–	1.6	
	0.25 · d ₁	1 x d ₁	1.7	1.4	
		1.5 x d ₁	–	1.3	
		2 x d ₁ ¹⁾	–	1.2	
0.5 · d ₁	1 x d ₁	1.3	1.1		
	1.5 x d ₁	–	1		
	2 x d ₁ ¹⁾	–	0.8		
0.75 · d ₁	1 x d ₁	1	0.8		
	1.5 x d ₁	–	0.7		
1 · d ₁	0.75 x d ₁	0.7	0.6	reduce by 20 %	

¹⁾ 1.8 x d₁ for diameter 14, 18, 20

Cutting speed v_c (m/min)	Cutting diameter (mm)		
	Feed per tooth f_z (mm/z.)		
	4-6	8-12	14-20
100-110	0.03	0.05	0.08
100	0.04	0.07	0.11
120-130	0.03	0.07	0.10
300-330	0.06	0.12	0.19
250-275	0.05	0.10	0.16
80-90	0.03	0.06	0.10
80-90	0.03	0.06	0.10
60-65	0.02	0.04	0.06
40-45	0.03	0.06	0.10
30-35	0.02	0.04	0.06

The cutting data indicated are starting values and must be adjusted to the prevailing conditions.

HPC01 Rougher 41/44M Features and benefits

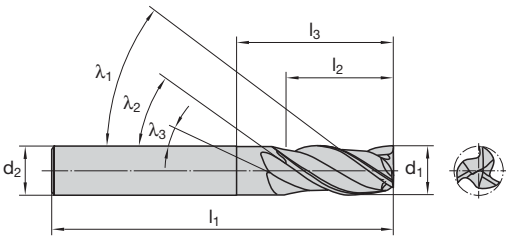


Benefits:

- At least 10 % more machining volume compared with the previous
- Increased process reliability thanks to stable cutting edges
- Low vibration due to varies helix angles
- Multi functional use – roughing and finishing, cutting of slots and ramping – all with one tool
- Excellent surface quality
- Large machining volume from high feed rates
- Longer tool life

HPC01 Rougher 33/35/37 UNI

High Performance slot mill with large room for chips for universal applications



Cat.-No.		HPC01-U-A				HPC01-U-B			
P		■				■			
M		■				■			
K		■				■			
N		■				■			
S		■				■			
H									
O									
d ₁	l ₂	l ₁	l ₃	d ₂	z	Ident No.	LMT-Code	Ident No.	LMT-Code
short									
4	5	54	8	6	3	7432428	EM-HPC01 U4.0x5/8 3C0.1HA	7432436	EM-HPC01 U4.0x5/8 3C0.1HB
5	6	54	10	6	3	7432429	EM-HPC01 U5.0x6/10 3C0.15HA	7432437	EM-HPC01 U5.0x6/10 3C0.15HB
6	7	54	12	6	3	7432430	EM-HPC01 U6.0x7/12 3C0.2HA	7432438	EM-HPC01 U6.0x7/12 3C0.2HB
8	9	58	16	8	3	7432431	EM-HPC01 U8.0x9/16 3C0.2HA	7432439	EM-HPC01 U8.0x9/16 3C0.2HB
10	11	66	20	10	3	7432432	EM-HPC01 U10.0x11/20 3C0.2HA	7432440	EM-HPC01 U10.0x11/20 3C0.2HB
12	12	73	24	12	3	7432433	EM-HPC01 U12.0x12/24 3C0.2HA	7432441	EM-HPC01 U12.0x12/24 3C0.2HB
16	16	82	32	16	3	7432434	EM-HPC01 U16.0x16/32 3C0.3HA	7432442	EM-HPC01 U16.0x16/32 3C0.3HB
20	20	92	40	20	3	7432435	EM-HPC01 U20.0x20/40 3C0.3HA	7432443	EM-HPC01 U20.0x20/40 3C0.3HB
long									
4	8	54	12	6	3	7432444	EM-HPC01 U4.0x8/12 3C0.1HA	7432452	EM-HPC01 U4.0x8/12 3C0.1HB
5	10	54	15	6	3	7432445	EM-HPC01 U5.0x10/15 3C0.15HA	7432453	EM-HPC01 U5.0x10/15 3C0.15HB
6	13	57	21	6	3	7432446	EM-HPC01 U6.0x13/21 3C0.2HA	7432454	EM-HPC01 U6.0x13/21 3C0.2HB
8	19	63	27	8	3	7432447	EM-HPC01 U8.0x19/27 3C0.2HA	7432455	EM-HPC01 U8.0x19/27 3C0.2HB
10	22	72	32	10	3	7432448	EM-HPC01 U10.0x22/32 3C0.2HA	7432456	EM-HPC01 U10.0x22/32 3C0.2HB
12	26	83	38	12	3	7432449	EM-HPC01 U12.0x26/38 3C0.2HA	7432457	EM-HPC01 U12.0x26/38 3C0.2HB
16	32	92	44	16	3	7432450	EM-HPC01 U16.0x32/44 3C0.3HA	7432458	EM-HPC01 U16.0x32/44 3C0.3HB
20	38	104	54	20	3	7432451	EM-HPC01 U20.0x38/54 3C0.3HA	7432459	EM-HPC01 U20.0x38/54 3C0.3HB

■ = First Choice
□ = Second choice

Edge protection chamfer	d ₁	b
	4	0.1
	5	0.15
	6-12	0.2
	14-20	0.3

Cutting data recommendations starting page 14

HPC01 Rougher 33/35/37 UNI Feed recommendations

The HPC01 Rougher 33/35/37 UNI is a 3-flute end mill. It is ideally suited to slot-ting work thanks to its large chip spaces and its extremely good chip removal. Each cutting edge has a different helix angle (33°/35°/37°).

Besides the entire range for stainless and acid-resistants steels, the HPC01 Rougher 33/35/37 UNI is also suitable for all steel applications.



Calculation formula and feed correction factors

Speed n (min^{-1}): $n = \frac{v_c \cdot 1000}{\pi \cdot d_1}$	Feed correction f_1				v_c	
	a_e	a_p	HPC01-U short f_1	HPC01-U long f_1		
Feed rate v_f (mm/min): $v_f = f_z \cdot z \cdot n \cdot f_1$	0.1 · d_1	1 x d_1	2	1.8	increase by 30 %	
		1.5 x d_1	–	1.7		
		2 x d_1 ¹⁾	–	1.6		
	0.25 · d_1	1 x d_1	2	1.4		
		1.5 x d_1	–	1.3		
		2 x d_1 ¹⁾	–	1.2		
	0.5 · d_1	1 x d_1	1.3	1.1		
		1.5 x d_1	–	1		
		2 x d_1 ¹⁾	–	0.8		
	0.75 · d_1	1 x d_1	1	0.8		
		1.5 x d_1	–	0.7		
		2 x d_1	–	0.6		
1 · d_1	0.5 x d_1	0.9	0.8	reduce by 20 %		
	1 x d_1	0.8	0.7			
	1.5 x d_1	–	0.6			

¹⁾ 1.8 x d_1 for diameter 14, 18, 20

HPC01 Rougher 33/35/37 UNI

Cutting data recommendations

Material	Material No.	DIN Description Old	R _m /UTS (N/mm ²)	DIN Description New	Coolant	
P Plain carbon steel + free cutting steel	1.0570	St52-3	-700	S355J2G3		
	1.1730	C45	-800	C45U		
	1.0715	9SMn28	-700	11SMn30		
	1.1191	Ck45	500-950	C45E		
	1.7219	26CrMo4		26CrMo4-2		
	Heat-treatment steel, medium strength	1.7225	42CrMo4	500-950	42CrMo4	
		1.8159	51CrV4		51CrV4	
	Cast steel	1.0416	GS40	-950	GS40	
	Case hardening steel	1.7131	16MnCr5	-950	16MnCr5	
	Stainless steel, ferritic, martensitic	1.4006	X10Cr13	500-950	X12Cr13	
		1.4104	X12CrMoS17		X14CrMoS17	
		1.4122	X35CrMo17		X39CrMo17-1	
	Heat-treatment steel, high strength	1.7225	42CrMo4	950-1400	42CrMo4	
		1.6580	30CrNiMo8		30CrNiMo8	
	Nitriding steel, heat treated	1.8504	34CrAl6	950-1400	34CrAl6	
1.2344		X40CrMoV5.1	-900	X40CrMoV5-1		
Tool steel	1.2343	X38CrMoV5 1	950-1400	X37CrMoV5-1		
	1.2379	X155CrVMo12 1	-950	X153CrMoV12-1		
	1.2316	X38CrMo16	-1100	X38CrMo16		
	1.2358	60CrMoV18-5	850-1000	60CrMoV18-5		
	1.2080	X210Cr12	950-1400	X210Cr12		
	1.2714	55NiCrMoV7	1100-1350	55NiCrMoV7		
	1.2311	40CrMnMo7	-1100	40CrMnMo7		
	1.2312	40CrMnNiMoS8.6	-1150	40CrMnNiMoS8-6		
1.2738	45CrMnNiMo8.6.4	950-1150	45CrMnNiMo8-6-4			
M Stainless steel, austenitic	1.4301	X2CrNiMo17-12-2	500-950	X5CrNiMo18-10		
	1.4404	X6CrNiMoTi17-12-2		X2CrNiMo17-12-2		
	1.4571	X10CrNiMoTi18		X10CrNiMoTi18		
	Stainless steel, martensitic steel	1.2709	X3NiCoMoTi18-9-5	800-1000	X3NiCoMoTi18-9-5	
		1.4542	X5CrNiCuNb16-4		X5CrNiCuNb16-4	
1.4568	X7CrNiAl17-7		X7CrNiAl17-7			
K Grey cast iron	0.6025	GG25	100-400 (120-260 HB)	EN-GJI-250		
	Alloyed grey cast iron	0.6678	GGL-NiCr35 2	150-250 (160-230 HB)	EN-GJLA-XNiCr35-2	
		0.7060	GGG60	400-800 (120-310 HB)	EN-GJS-600-3	
	0.7070	GGG70L		EN-GJS-700-2U		
Malleable cast iron	0.8155	GTS55	350-700 (150-280 HB)	EN-GJMB-550-4		
N Aluminium alloys, short chipping	3.2581	G-AISi12	-400	G-IGK-AISi12		
	Copper alloys, short chipping	2.0402	MS58	-500	CuZn40Pb2	
S Titanium alloys, medium strength	3.7115	TiAl5Sn2.5	-950	TiAl5Sn2-5		
	3.7164	TiAl6V4		Ti6AlV4		
	Titanium alloys, high strength	3.7174	TiAl6Sn2	900-1400	TiAl6V6Sn2	
		2.4670	NiCr12Al6MoNb	-950	NiCr12Al6MoNb	
Nickel based alloys, medium strength	2.4668	NiCr19Fe19NbMo	900-1400	Inconel 718		
Heat resistant nickel based alloys, high strength				NiCr19Fe19Nb5Mo3		

Dry machining,
air-blast cooling is advantageous









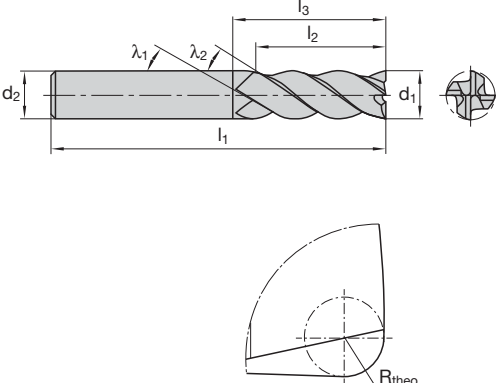


Wet machining,
sufficient emulsion volume required

	Cutting speed v_c (m/min)	Cutting diameter (mm)							
		Feed per tooth f_z (mm/z.)							
		4	5	6	8	10	12	14-16	18-20
	230	0.04	0.06	0.07	0.09	0.11	0.13	0.18	0.22
	230	0.04	0.06	0.07	0.09	0.11	0.13	0.18	0.22
	200	0.04	0.05	0.06	0.08	0.10	0.12	0.16	0.20
	160	0.04	0.05	0.06	0.08	0.10	0.12	0.16	0.20
	130	0.03	0.04	0.05	0.07	0.09	0.10	0.14	0.17
	160	0.04	0.05	0.06	0.08	0.10	0.12	0.16	0.20
	140	0.03	0.04	0.05	0.06	0.08	0.09	0.12	0.15
	120	0.03	0.04	0.05	0.06	0.08	0.09	0.12	0.15
	110	0.03	0.04	0.05	0.06	0.08	0.09	0.12	0.15
	100	0.03	0.04	0.04	0.06	0.07	0.08	0.11	0.14
	100	0.02	0.03	0.03	0.04	0.05	0.06	0.08	0.10
	120	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.13
	180	0.06	0.07	0.08	0.11	0.14	0.17	0.22	0.28
	160	0.05	0.06	0.07	0.10	0.12	0.14	0.19	0.24
	150	0.04	0.06	0.07	0.09	0.11	0.13	0.18	0.22
	120	0.04	0.06	0.07	0.09	0.11	0.13	0.18	0.22
	300	0.05	0.06	0.08	0.10	0.13	0.15	0.20	0.25
	250	0.04	0.05	0.06	0.08	0.10	0.12	0.16	0.20
	80	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.13
	60	0.02	0.03	0.03	0.04	0.05	0.06	0.08	0.10
	40	0.03	0.03	0.04	0.05	0.07	0.08	0.10	0.13
	30	0.02	0.03	0.03	0.04	0.05	0.06	0.08	0.10

The cutting data indicated are starting values and must be adjusted to the prevailing conditions.
 Feed correction factor f_1 see page 13

HPC01 Rougher 35/38 H

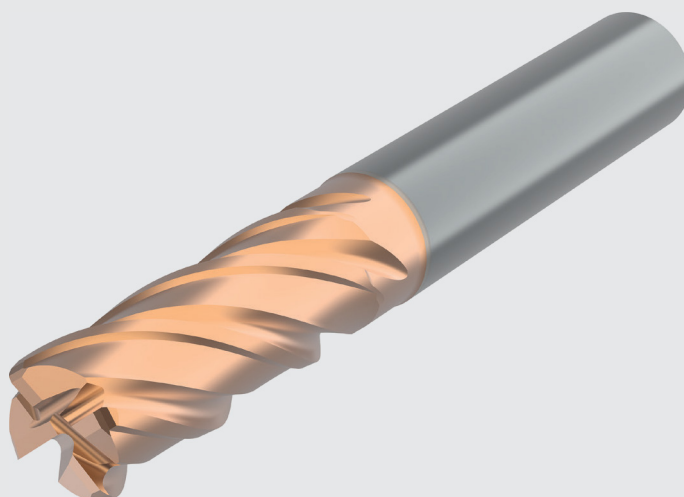
High Performance Cutter for hard materials ≤ 55 HRC

     										
										
Cat.-No.							HPC01-H-A		HPC01-H-B	
P							■		■	
M										
K							□		□	
N										
S										
H							■		■	
O										
d ₁	l ₂	l ₁	l ₃	d ₂	R _{theo} (+ 0.1)	z	Ident No.	LMT-Code	Ident No.	LMT-Code
short										
6	7	54	16	6	0.5	4	7429426	EM-HPC01 H6.0x7/16 4R0.5HA	7429435	EM-HPC01 H6.0x7/16 4R0.5HB
8	9	58	20	8	0.5	4	7429427	EM-HPC01 H8.0x9/20 4R0.5HA	7429436	EM-HPC01 H8.0x9/20 4R0.5HB
10	11	66	24	10	0.5	4	7429428	EM-HPC01 H10.0x11/24 4R0.5HA	7429437	EM-HPC01 H10.0x11/24 4R0.5HB
12	12	73	26	12	0.5	4	7429429	EM-HPC01 H12.0x12/26 4R0.5HA	7429438	EM-HPC01 H12.0x12/26 4R0.5HB
12	12	73	26	12	1	4	7429430	EM-HPC01 H12.0x12/26 4R1.0HA	7429439	EM-HPC01 H12.0x12/26 4R1.0HB
16	16	82	32	16	0.5	4	7429431	EM-HPC01 H16.0x16/32 4R0.5HA	7429440	EM-HPC01 H16.0x16/32 4R0.5HB
16	16	82	32	16	1	4	7429432	EM-HPC01 H16.0x16/32 4R1.0HA	7429441	EM-HPC01 H16.0x16/32 4R1.0HB
20	20	92	40	20	0.5	4	7429433	EM-HPC01 H20.0x20/40 4R0.5HA	7429442	EM-HPC01 H20.0x20/40 4R0.5HB
20	20	92	40	20	1	4	7429434	EM-HPC01 H20.0x20/40 4R1.0HA	7429443	EM-HPC01 H20.0x20/40 4R1.0HB
long										
6	15	57	21	6	0.5	4	7429444	EM-HPC01 H6.0x15/21 4R0.5HA	7429453	EM-HPC01 H6.0x15/21 4R0.5HB
8	20	63	27	8	0.5	4	7429445	EM-HPC01 H8.0x20/27 4R0.5HA	7429454	EM-HPC01 H8.0x20/27 4R0.5HB
10	25	72	32	10	0.5	4	7429446	EM-HPC01 H10.0x25/32 4R0.5HA	7429455	EM-HPC01 H10.0x25/32 4R0.5HB
12	30	83	38	12	0.5	4	7429447	EM-HPC01 H12.0x30/38 4R0.5HA	7429456	EM-HPC01 H12.0x30/38 4R0.5HB
12	30	83	38	12	1	4	7429448	EM-HPC01 H12.0x30/38 4R1.0HA	7429457	EM-HPC01 H12.0x30/38 4R1.0HB
16	35	92	44	16	0.5	4	7429449	EM-HPC01 H16.0x35/44 4R0.5HA	7429458	EM-HPC01 H16.0x35/44 4R0.5HB
16	35	92	44	16	1	4	7429450	EM-HPC01 H16.0x35/44 4R1.0HA	7429459	EM-HPC01 H16.0x35/44 4R1.0HB
20	44	104	54	20	0.5	4	7429451	EM-HPC01 H20.0x44/54 4R0.5HA	7429460	EM-HPC01 H20.0x44/54 4R0.5HB
20	44	104	54	20	1	4	7429452	EM-HPC01 H20.0x44/54 4R1.0HA	7429461	EM-HPC01 H20.0x44/54 4R1.0HB

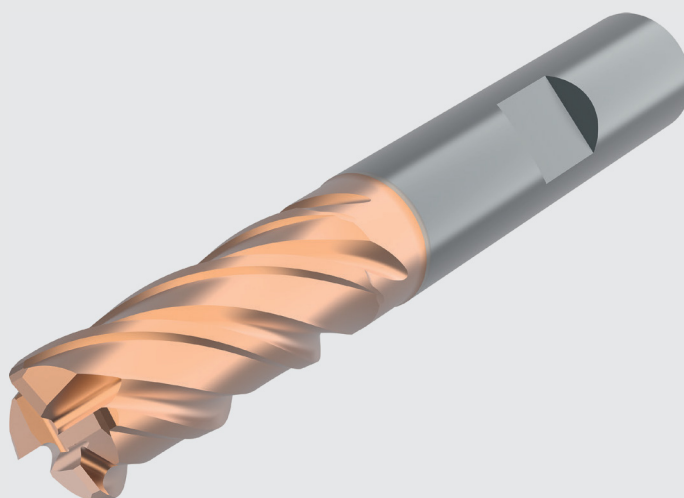
Cutting data recommendations starting page 18

■ = First Choice
□ = Second choice

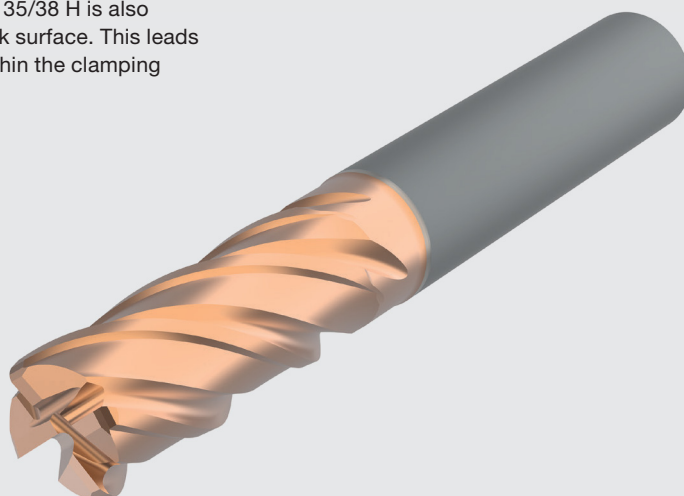
Standard shank DIN 6535 HA



Standard shank DIN 6535 HB



By request, the HPC01 Rougher 35/38 H is also available with a roughened shank surface. This leads to even better holding forces within the clamping fixture.



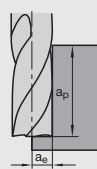
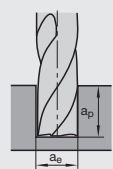
HPC01 Rougher 35/38 H

Cutting data recommendations

Material	Material No.	DIN Description Old	R _m /UTS (N/mm ²)	DIN Description New	
P Nitriding steel, heat treated	1.7225	42CrMo4	950-1400	42CrMo4	
	1.2344	X40CrMoV5.1	-900	X40CrMoV5-1	
	1.4104	X12CrMoS17	500-950	X14CrMoS17	
	1.8504	34CrAl6	950-1400	34CrAl6	
	Tool steel	1.2343	X38CrMoV5 1	950-1400	X37CrMoV5-1
		1.6580	30CrNiMo8	950-1400	30CrNiMo8
		1.2379	X155CrMo12 1	-950	X153CrMoV12-1
		1.2080	X210Cr12	950-1400	X210Cr12
		1.2311	40CrMnMo7	-1100	40CrMnMo7
		1.2312	40CrMnNiMoS8.6	-1150	40CrMnNiMoS8-6
		1.2738	45CrMnNiMo8.6.4	950-1150	45CrMnNiMo8-6-4
		1.2358	60CrMoV18-5	850-1000	60CrMoV18-5
1.2714	55NiCrMoV7	1100-1350	55NiCrMoV7		
K Grey cast iron	0.6025	GG25	100-400 (120-260 HB)	EN-GJI-250	
	Alloyed grey cast iron	0.6678	GGL-NiCr35 2	150-250 (160-230 HB)	EN-GJLA-XNiCr35-2
		0.7060 0.7070	GGG60 GGG70L	400-800 (120-310 HB)	EN-GJS-600-3 EN-GJS-700-2U
	Malleable cast iron	0.8155	GTS55	350-700 (150-280 HB)	EN-GJMB-550-4
H Chilled cast iron		Ni-hard, Ampco	300-600 HB	Ni-hard, Ampco	
	Hardened steel		Sleipner, Toolox	45-49 HRC	Sleipner, Toolox
			Dievar	50-53 HRC	Dievar
			Vandis, Sverker	54-55 HRC	Vandis, Sverker

Calculation formula and feed correction factors

Speed n (min ⁻¹): $n = \frac{v_c \cdot 1000}{\pi \cdot d_1}$	Feed correction f ₁			
	a _e	a _p	HPC01-H short f ₁	HPC01-H long f ₁
Feed rate v _f (mm/min): $v_f = f_z \cdot z \cdot n \cdot f_1$	0.1 · d ₁	1 x d ₁	2	1.8
		1.5 x d ₁	-	1.6
	0.25 · d ₁	2 x d ₁	-	1.4
		1 x d ₁	1.9	1.4
	0.5 · d ₁	1.5 x d ₁	-	1.2
		2 x d ₁	-	1
		1 x d ₁	1.4	1
	0.75 · d ₁	1.5 x d ₁	-	0.8
		2 x d ₁	-	0.6
		1 x d ₁	0.9	0.6
	1 · d ₁	1.5 x d ₁	-	0.5
		0.5 x d ₁	0.7	0.6
	1 x d ₁	0.6	0.5	

a_e = Width of cut in mm
a_p = Depth of cut in mm
d₁ = Cutter diameter in mm
f₁ = Correction factor for v_f
f_z = Feed per tooth in mm
n = Speed in min⁻¹
v_f = Feed rate in mm/min
z = No. of teeth

Dry machining, mind sufficient air-blast cooling
Slot milling, sufficient air-blast cooling avoids chip congestion

Cutting speed v_c (m/min)	Cutting diameter (mm)		
	Feed per tooth f_z (mm/z.)		
	Ø 6–8	Ø 10–12	Ø 16–20
120–140	0.04–0.06	0.06–0.08	0.15–0.18
120–140	0.04–0.06	0.06–0.08	0.15–0.18
120–140	0.04–0.06	0.06–0.08	0.15–0.18
120–140	0.04–0.06	0.06–0.08	0.15–0.18
100–120	0.03–0.05	0.05–0.08	0.12–0.15
120–140	0.03–0.05	0.05–0.08	0.12–0.15
100–120	0.03–0.05	0.05–0.08	0.12–0.15
100–120	0.03–0.05	0.05–0.08	0.12–0.15
120–140	0.03–0.05	0.05–0.08	0.12–0.15
140–160	0.03–0.05	0.05–0.08	0.12–0.15
120–140	0.03–0.05	0.05–0.08	0.12–0.15
100–120	0.03–0.05	0.05–0.08	0.12–0.15
100–120	0.03–0.05	0.05–0.08	0.12–0.15
180–220	0.09–0.12	0.15–0.18	0.22–0.28
160–180	0.08–0.11	0.13–0.16	0.20–0.26
150–180	0.07–0.10	0.12–0.14	0.19–0.24
120–150	0.07–0.10	0.12–0.14	0.19–0.24
80–100	0.01–0.02	0.02–0.03	0.04–0.05
100–120	0.02–0.03	0.04–0.05	0.08–0.10
80–100	0.01–0.02	0.02–0.03	0.06–0.08
80	0.01–0.02	0.02–0.03	0.05–0.06

The cutting data indicated are starting values and must be adjusted to the prevailing conditions.

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