HORN

NEW

NEUE HPC-VOLLHARTMETALLFRÄSER

Dynamisches HPC-Fräsen mit dem HORN-System DS

NEW HPC SOLID CARBIDE END MILLS

Dynamic HPC milling with the HORN DS system

DER UNTERSCHIED: MEHR MÖGLICHKEITEN

THE DIFFERENCE: MORE POSSIBILITIES

- **Hohe Laufruhe durch abgestimmte Drallwinkel und Zahnteilung**
  Quiet operation due to matched helix angle and tooth pitch

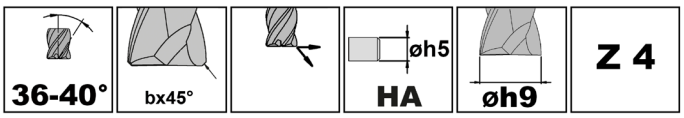
- **Große Zeitspanvolumen durch spezielle HPC-Geometrie**
  High metal removal rates due to special HPC geometry

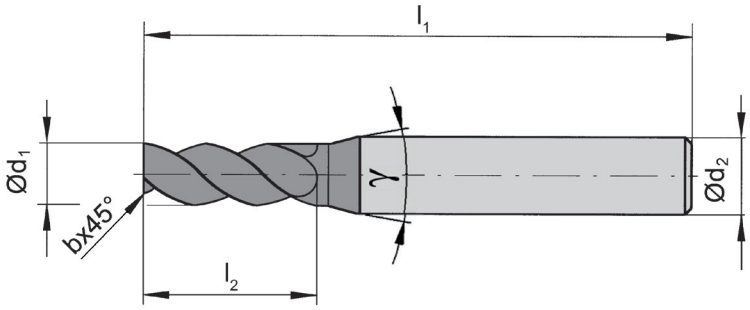
- **Optimierte Geometrie zum Bohr-zirkularfräsen**
  Optimised geometry for circular ramp milling

Schaftfräser HPC, Eckfase

End Mill HPC, corner bevel

DSHPC





Bestellnummer Part number	d_1	b	l_2	d_2	l_1	Z	γ	ES3P
DSHPC.4.020.008.25	2	0,07	5	6	50	4	40°	▲
DSHPC.4.030.010.23	3	0,10	7	6	50	4	40°	▲
DSHPC.4.040.010.22	4	0,10	9	6	50	4	40°	▲
DSHPC.4.050.010.22	5	0,10	11	6	54	4	40°	▲
DSHPC.4.060.015.21	6	0,15	13	6	54	4	-	▲
DSHPC.4.080.015.21	8	0,15	17	8	63	4	-	▲
DSHPC.4.100.020.21	10	0,20	21	10	66	4	-	▲
DSHPC.4.120.030.21	12	0,30	26	12	83	4	-	▲
DSHPC.4.160.050.21	16	0,50	34	16	92	4	-	▲
DSHPC.4.200.050.21	20	0,50	42	20	104	4	-	▲

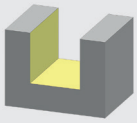
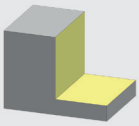
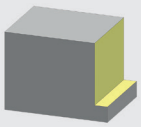
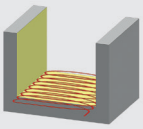
▲ ab Lager / on stock Δ 4 Wochen / 4 weeks x auf Anfrage / upon request
● empfohlen / recommended
o bedingt einsetzbar / alternative recommendation
- nicht geeignet / not suitable
unbeschichtete HM-Sorten / uncoated grades
beschichtete HM-Sorten / coated grades
bestückt/Cermet / brazed/Cermet
Abmessungen in mm
Dimensions in mm

	ES3P
P	•
M	•
K	•
N	-
S	o
H	-

HM-Sorten
Carbide grades

Schnittdaten DSHPC Ø 2 - 20 mm

Cutting Data DSHPC Ø 2 - 20 mm

	 vc = m/min	 vc = m/min	 vc = m/min	 vc = m/min
P1.1	130	160	180	210
P1.2	130	160	180	210
P1.3	120	150	170	200
P2.1	110	140	150	180
P2.2	110	140	150	180
P2.3	110	140	150	180
P3.1	100	120	130	160
P3.2	100	120	130	160
M1.1	80	100	110	130
M2.1	70	90	100	120
M3.1	60	80	90	100
K1.1	110	140	150	180
K1.2	100	130	140	170
K2.1	100	120	130	160
K2.2	90	110	120	140
K3.1	70	90	100	120
K3.2	60	80	90	100
S1.1	50	60	70	80
S2.1	40	50	60	70
S3.1	30	40	40	50

d_1	l_2													
			fz	ae	ap	fz	ae	ap	fz	ae	ap	fz	ae	ap
2	5	3°	0,010	2	2	0,013	0,50	4	0,008	0,05	5	0,019	0,26	5
3	7	3°	0,016	3	3	0,022	0,75	6	0,011	0,08	7	0,03	0,39	7
4	9	3°	0,022	4	4	0,030	1,00	8	0,015	0,10	9	0,041	0,52	9
5	11	4°	0,029	5	5	0,038	1,25	10	0,019	0,13	11	0,053	0,65	11
6	13	4°	0,035	6	6	0,047	1,50	12	0,023	0,15	13	0,065	0,78	13
8	17	5°	0,047	8	8	0,063	2,00	16	0,030	0,20	17	0,088	1,04	17
10	21	5°	0,060	10	10	0,080	2,50	20	0,038	0,25	21	0,111	1,30	21
12	26	5°	0,070	12	12	0,093	3,00	24	0,046	0,30	26	0,129	1,56	26
16	34	5°	0,095	16	16	0,126	4,00	32	0,061	0,40	34	0,175	2,08	34
20	42	5°	0,120	20	20	0,160	5,00	40	0,076	0,50	42	0,222	2,60	42

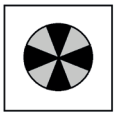
Abmessungen in mm

Dimensions in mm

Werkstoffübersicht
Material Overview

	Werkstoff	*Material*			Härte / *Hardness*
P1.1	Kohlenstoffstahl	*Carbon steel*	0,2% C		140 HB
P1.2	Kohlenstoffstahl	*Carbon steel*	0,4% C		180 HB
P1.3	Kohlenstoffstahl	*Carbon steel*	0,6% C		200 HB
P2.1	Legierter Stahl	*Alloyed steel*	geglüht	*annealed*	180 HB
P2.2	Legierter Stahl	*Alloyed steel*	vergütet	*quenched*	280 HB
P2.3	Legierter Stahl	*Alloyed steel*	vergütet	*quenched*	350 HB
P3.1	hochlegierter Stahl	*High alloyed steel*	geglüht	*annealed*	200 HB
P3.2	hochlegierter Stahl	*High alloyed steel*	vergütet	*quenched*	325 HB
M1.1	Rostfreier Stahl	*Stainless steel*	martensitisch, ferritisch	*martensitic, ferritic*	200 HB
M2.1	Rostfreier Stahl	*Stainless steel*	austenitisch	*austenitic*	180 HB
M3.1	Rostfreier Stahl	*Stainless steel*	austenitisch, ferritisch	*austenitic, ferritic*	260 HB
K1.1	Grauguss	*Grey cast iron*	niedrige Festigkeit	*low tensile strength*	180 HB
K1.2	Grauguss	*Grey cast iron*	hohe Festigkeit	*high tensile strength*	250 HB
K2.1	Kugelgraphitguss	*Spheroidal graphite cast iron*	ferritisch	*ferritic*	160 HB
K2.2	Kugelgraphitguss	*Spheroidal graphite cast iron*	perlitisch	*perlitic*	250 HB
K3.1	Temperguss	*Malleable cast iron*	ferritisch	*ferritic*	125 HB
K3.2	Temperguss	*Malleable cast iron*	perlitisch	*perlitic*	225 HB
N1.1	Aluminium-Legierungen	*Aluminum alloys*	nicht vergütbar	*not heat treatable*	80 HB
N1.2	Aluminium-Legierungen	*Aluminum alloys*	vergütbar	*heat treatable*	120 HB
N2.1	Aluminiumguss	*Cast Aluminum*	< 6% Si	*< 6% Si*	
N2.2	Aluminiumguss	*Cast Aluminum*	6 - 10% Si	*6 - 10% Si*	
N2.3	Aluminiumguss	*Cast Aluminum*	10 - 15% Si	*10 - 15% Si*	
N3.1	Kupfer-Legierungen	*Copper alloys*	nicht vergütbar	*not heat treatable*	90 HB
N3.2	Kupfer-Legierungen	*Copper alloys*	vergütbar	*heat treatable*	100 HB
N4.1	Kunststoffe	*Synthetics*			
S1.1	Titan-Legierungen	*Titanium alloys*			280 HB
S2.1	Nickel-Basis-Legierung	*Nickel-base alloys*			450 HB
S3.1	Cobalt-Basis-Legierung	*Cobalt-base alloys*			450 HB
H1.1	Gehärtete Stähle	*Hardened steels*			50-55 HRC
H1.2	Gehärtete Stähle	*Hardened steels*			56-59 HRC
H1.3	Gehärtete Stähle	*Hardened steels*			60-63 HRC
H1.4	Gehärtete Stähle	*Hardened steels*			> 63 HRC

Übersicht Anwendungen
Overview Application

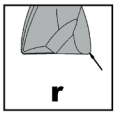


Zentrumsschneidend
Centre cutting

Zähnezahl
Number of teeth

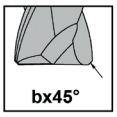
Wuchtgüte
Balance quality

Drallwinkel
Helix angle

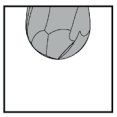


Eckenradius
Corner radius

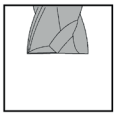
Radius theoretisch
Radius theoretic



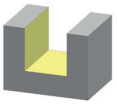
Eckfase
Corner chamfer



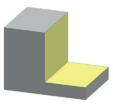
Vollradius
Full radius



Scharfkantig
Sharp



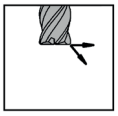
Vollnut
Slot milling



Eckfräsen
Corner milling

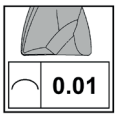
Kopierfräsen
Copy milling

Eintauchen horizontal
Diving horizontal



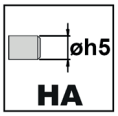
Eintauchen, Rampe, Helix,
Diving, ramping, helical

Eintauchen, Rampe, Helix, vertikal
Diving, ramping, helical, vertical

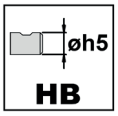


Formtoleranz
Form tolerance

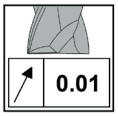
Toleranz
Tolerance



Schaft DIN 6535 HA
Shank DIN 6535 HA

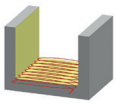


Schaft DIN 6535 HB
Shank DIN 6535 HB



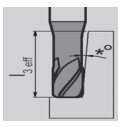
Rundlauf
Run-out

Innenkühlung
Internal cooling



Trochoidalfräsen
Trochoidal milling

Eintauchen
Diving



Effektive Nutzlänge
Effective neck length

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