

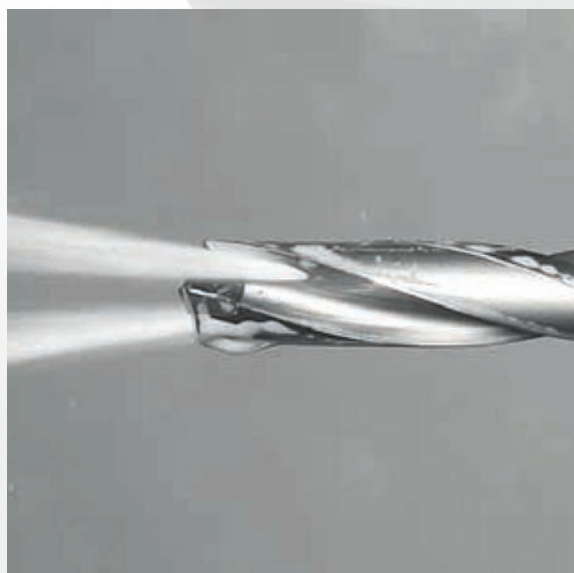


HARTNER

Precision Cutting Tools

MULTIPLEX HPC

THE INTERCHANGEABLE INSERT DRILLING SYSTEM
FOR HOLES UP TO 10xD UP TO DIAMETER 40.0 mm



























+ new interchangeable insert for the machining of steel beams

ISO code

P	Steel, high-alloyed steel
M	Stainless steel
K	Grey cast iron, spher. graphite iron and malleable cast iron
N	Aluminium and other non-ferrous metals
S	Special, super and titanium alloys
H	Hardened steel and chilled cast iron

Pictograms

Tool material	VHM
	Solid carbide
Surface	      
	bright AlTiN nano FIRE TiAlN TiAlSiN nickel-plated TiN
Type	HPC
Drilling depth	     
Tolerance on Ø	 
Standard	
	to Hartner Standard
Point angle	  
Cutting direction	 
	right neutral
Shank form	
	to DIN 6535
Web thinning	
Internal coolant	
	with IC





MULTIPLEX HPC

- ▼ TOOL HOLDERS
FOR INTERCHANGEABLE INSERTS

PAGE 9



MULTIPLEX HPC

- ▼ INTERCHANGEABLE INSERTS

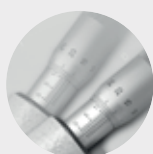
PAGE 20



MULTIPLEX HPC

- ▼ ACCESSORIES

PAGE 45



TECHNICAL SECTION

- ▼ THE COATINGS
- ▼ MULTIPLEX HPC – TECHNOLOGY
AND ADVANTAGES
- ▼ TROUBLESHOOTING

PAGE 51



APPLICATION RECOMMENDATIONS

PAGE 58

MODULAR TOOLING SYSTEM

MULTIPLEX HPC

With the Multiplex HPC interchangeable drilling system Hartner provides high-performance and cost-efficient holders for holes in the diameter range from 11.00 to 40.0 mm.

The Multiplex HPC drilling system is therefore ideal for the production of large, highly accurate holes in various materials for applications in the energy technology, automotive, mechanical engineering or steel construction sector.

extended tool life

- interchangeable inserts perfectly adapted to the field of application regarding tool material, geometry and surface finish
- optimal machining results in steel, stainless steel, cast iron or aluminium

optimal chip evacuation

- special flute cross-section
- ultra-smooth surface finish

rigid holders

- close stepped diameter jumps with the holder sizes reduce wear
- improved workpiece surfaces
- better guidance of the tool increase the rigidity
- longer tool life

highly accurate insert seat

- insert change in the machine
- holder remains clamped
- tool change and re-setting not required
- increased process reliability and reduced setting-up time

perfect cooling lubrication

- coolant ducts with maximum cross section
- exit from the flute



MULTIPLEX HPC – TOOL HOLDERS

The correct holder for any drilling depth and application

Article no.	86681	86682	86683	86684	86685	86686
Drilling depth	1xD	1,5xD	3xD	5xD	7xD	10xD
Diameter	11.0-40.00	11.0-40.00	11.0-40.00	11.0-40.00	11.0-31.99	11.0-31.99
Shank form	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE
Page	19	9	11	13	15	17

**Pilot drilling/
countersinking 45°**



The pilot holder, art. no. 86681, is equipped with an interface for countersink inserts. This enables the simultaneous machining of a 45° chamfer during the production of the pilot hole.

MULTIPLEX HPC – INTERCHANGEABLE INSERTS

The correct insert for any material and application

					for pilot drilling	for steel beams
						
Interchangeable inserts	86722	86725	86723	86724	86721	86729
Article no.	20	24	28	32	36	40
Page						
						
Countersinking insert	86728		86726	86727		
Article no.	42		43	44		
Page						

P	M	K	N	S	H	Standard	Type	Tool material	Surface	Cutting direction	Internal coolant	Drilling depth	d1/mm	Article no.	Progr. page
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Multiplex HPC holders



						Company std.	HPC	Ⓝ		right-hand	with	1.5xD	11.000 - 39.005	86682	9
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						Company std.	HPC	Ⓝ		right-hand	with	3xD	11.000 - 39.005	86683	11
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						Company std.	HPC	Ⓝ		right-hand	with	5xD	11.000 - 39.000	86684	13
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						Company std.	HPC	Ⓝ		right-hand	with	7xD	11.000 - 31.505	86685	15
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						Company std.	HPC	Ⓝ		right-hand	with	10xD	11.000 - 31.505	86686	17
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						Company std.		Ⓝ		right-hand	with	1xD	11.000 - 36.005	86681	19
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Multiplex HPC interchangeable inserts



●	○	○				Company std.	HPC	Solid carbide	Ⓝ	right-hand			11.000 - 40.000	86722	20
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○	●			○	○	Company std.	HPC	Solid carbide	Ⓝ	right-hand			11.000 - 40.000	86725	24
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P	M	K	N	S	H	Standard	Type	Tool material	Surface	Cutting direction	Internal coolant	Drilling depth	d1/mm	Article no.	Progr. page
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Multiplex HPC interchangeable inserts



○	●	○	○	○	○	Company std.	HPC	Solid carbide	Y	right-hand		11.000 - 40.000	86723	28
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○	○	○	●	○	○	Company std.	HPC	Solid carbide	○	right-hand		11.000 - 40.000	86724	32
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○	○	○	○	○	○	Company std.	HPC	Solid carbide	Ⓜ	right-hand		11.000 - 40.000	86721	36
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●	○	○	○	○	○	Company std.		Solid carbide	Ⓜ	right-hand		12.000 - 40.000	86729	40
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Multiplex HPC countersink inserts



●	○	○	○	○	○	Company std.		Solid carbide	T	right-hand		52.020 - 93.080	86728	42
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○	○	○	○	○	○	Company std.		Solid carbide	A	left and right		52.020 - 93.080	86726	43
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○	○	○	○	○	○	Company std.		Solid carbide	○	right-hand		52.020 - 93.080	86727	44
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P	M	K	N	S	H	Standard	Type	Tool material	Surface	Cutting direction	Internal coolant	Drilling depth	d1/mm	Article no.	Progr. page
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Clamping screws for countersink holders



Company
std.

2.000 - 4.006

86846

45

Clamping screws for HPC Multiplex holders 1.5-10xD



Company
std.

2.200 - 6.002

86843

46

Torque wrenches



Company
std.

1.001 - 14.000

86844

47

Torx bits



Company
std.

5.000 - 25.001

86845

48

Accessories



Company
std.

5.001 - 25.001

86842

49

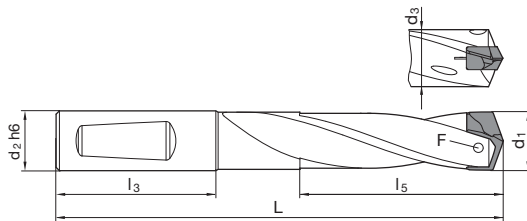


Multiplex HPC holders

Article no. 86682



especially high wear resistance • optimised flute design • optimised coolant duct exit • clamping screws art. no. 86843 included
• screwdriver art. no. 86842 included



Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
110	11.00-11.49	12.000	10.700	84.000	45.000	19.300	86843 2.200	11.000
110	11.00-11.49	12.700	10.700	84.000	45.000	19.300	86843 2.200	11.005
115	11.50-11.99	12.000	11.200	85.000	45.000	20.100	86843 2.200	11.500
115	11.50-11.99	12.700	11.200	85.000	45.000	20.100	86843 2.200	11.505
120	12.00-12.49	12.000	11.700	87.000	45.000	21.000	86843 2.201	12.000
120	12.00-12.49	12.700	11.700	87.000	45.000	21.000	86843 2.201	12.005
125	12.50-12.99	14.000	12.200	89.000	45.000	21.900	86843 2.201	12.500
125	12.50-12.99	15.875	12.200	89.000	45.000	21.900	86843 2.201	12.505
130	13.00-13.49	14.000	12.700	90.000	45.000	22.600	86843 2.500	13.000
130	13.00-13.49	15.875	12.700	90.000	45.000	22.600	86843 2.500	13.005
135	13.50-13.99	14.000	13.200	92.000	45.000	23.600	86843 2.500	13.500
135	13.50-13.99	15.875	13.200	92.000	45.000	23.600	86843 2.500	13.505
140	14.00-14.49	14.000	13.700	93.000	45.000	24.500	86843 3.000	14.000
140	14.00-14.49	15.875	13.700	93.000	45.000	24.500	86843 3.000	14.005
145	14.50-14.99	16.000	14.200	98.000	48.000	25.300	86843 3.000	14.500
145	14.50-14.99	15.875	14.200	98.000	48.000	25.300	86843 3.000	14.505
150	15.00-15.49	16.000	14.700	100.000	48.000	26.100	86843 3.001	15.000
150	15.00-15.49	15.875	14.700	100.000	48.000	26.100	86843 3.001	15.005
155	15.50-15.99	16.000	15.200	101.000	48.000	27.000	86843 3.001	15.500
155	15.50-15.99	15.875	15.200	101.000	48.000	27.000	86843 3.001	15.505
160	16.00-16.49	16.000	15.700	102.000	48.000	27.800	86843 3.500	16.000
160	16.00-16.49	15.875	15.700	102.000	48.000	27.800	86843 3.500	16.005
165	16.50-16.99	18.000	16.200	105.000	48.000	28.700	86843 3.500	16.500
165	16.50-16.99	19.050	16.200	105.000	48.000	28.700	86843 3.500	16.505
170	17.00-17.49	18.000	16.700	106.000	48.000	29.600	86843 3.500	17.000
170	17.00-17.49	19.050	16.700	106.000	48.000	29.600	86843 3.500	17.005
175	17.50-17.99	18.000	17.200	107.000	48.000	30.400	86843 3.500	17.500
175	17.50-17.99	19.050	17.200	107.000	48.000	30.400	86843 3.500	17.505
180	18.00-18.49	18.000	17.700	109.000	48.000	31.200	86843 4.000	18.000
180	18.00-18.49	19.050	17.700	109.000	48.000	31.200	86843 4.000	18.005
185	18.50-18.99	20.000	18.200	113.000	50.000	32.100	86843 4.000	18.500
185	18.50-18.99	19.050	18.200	113.000	50.000	32.100	86843 4.000	18.505
190	19.00-19.49	20.000	18.700	114.000	50.000	32.900	86843 4.000	19.000
190	19.00-19.49	19.050	18.700	114.000	50.000	32.900	86843 4.000	19.005
195	19.50-19.99	20.000	19.200	116.000	50.000	33.700	86843 4.000	19.500
195	19.50-19.99	19.050	19.200	116.000	50.000	33.700	86843 4.000	19.505
200	20.00-20.49	20.000	19.700	117.000	50.000	34.600	86843 4.500	20.000
200	20.00-20.49	19.050	19.700	117.000	50.000	34.600	86843 4.500	20.005
205	20.50-20.99	25.000	20.200	128.000	56.000	35.500	86843 4.500	20.500
205	20.50-20.99	25.400	20.200	128.000	56.000	35.500	86843 4.500	20.505
210	21.00-21.49	25.000	20.700	129.000	56.000	36.400	86843 4.500	21.000
210	21.00-21.49	25.400	20.700	129.000	56.000	36.400	86843 4.500	21.005



Multiplex HPC holders

Size mm	d1	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	F	Code no.
215	21.50-21.99	25.000	21.200	130.000	56.000	37.200	86843 4.500	21.500
215	21.50-21.99	25.400	21.200	130.000	56.000	37.200	86843 4.500	21.505
220	22.00-22.49	25.000	21.700	131.000	56.000	38.000	86843 5.000	22.000
220	22.00-22.49	25.400	21.700	131.000	56.000	38.000	86843 5.000	22.005
225	22.50-22.99	25.000	22.200	134.000	56.000	38.900	86843 5.000	22.500
225	22.50-22.99	25.400	22.200	134.000	56.000	38.900	86843 5.000	22.505
230	23.00-23.49	25.000	22.700	135.000	56.000	39.800	86843 5.000	23.000
230	23.00-23.49	25.400	22.700	135.000	56.000	39.800	86843 5.000	23.005
235	23.50-23.99	25.000	23.200	137.000	56.000	40.600	86843 5.000	23.500
235	23.50-23.99	25.400	23.200	137.000	56.000	40.600	86843 5.000	23.505
240	24.00-24.49	25.000	23.700	138.000	56.000	41.500	86843 5.001	24.000
240	24.00-24.49	25.400	23.700	138.000	56.000	41.500	86843 5.001	24.005
245	24.50-24.99	25.000	24.200	140.000	56.000	42.300	86843 5.001	24.500
245	24.50-24.99	25.400	24.200	140.000	56.000	42.300	86843 5.001	24.505
250	25.00-25.49	25.000	24.700	142.000	56.000	43.200	86843 5.001	25.000
250	25.00-25.49	25.400	24.700	142.000	56.000	43.200	86843 5.001	25.005
255	25.50-25.99	32.000	25.200	148.000	60.000	44.000	86843 5.001	25.500
255	25.50-25.99	31.750	25.200	148.000	60.000	44.000	86843 5.001	25.505
260	26.00-26.49	32.000	25.700	151.000	60.000	44.300	86843 5.003	26.000
260	26.00-26.49	31.750	25.700	151.000	60.000	44.300	86843 5.003	26.005
265	26.50-26.99	32.000	26.200	153.000	60.000	45.100	86843 5.003	26.500
265	26.50-26.99	31.750	26.200	153.000	60.000	45.100	86843 5.003	26.505
270	27.00-27.49	32.000	26.700	155.000	60.000	46.000	86843 5.003	27.000
270	27.00-27.49	31.750	26.700	155.000	60.000	46.000	86843 5.003	27.005
275	27.50-27.99	32.000	27.200	156.000	60.000	46.800	86843 5.003	27.500
275	27.50-27.99	31.750	27.200	156.000	60.000	46.800	86843 5.003	27.505
280	28.00-28.49	32.000	27.700	157.000	60.000	47.700	86843 5.003	28.000
280	28.00-28.49	31.750	27.700	157.000	60.000	47.700	86843 5.003	28.005
285	28.50-28.99	32.000	28.200	159.000	60.000	48.500	86843 5.003	28.500
285	28.50-28.99	31.750	28.200	159.000	60.000	48.500	86843 5.003	28.505
290	29.00-29.49	32.000	28.700	161.000	60.000	49.400	86843 5.003	29.000
290	29.00-29.49	31.750	28.700	161.000	60.000	49.400	86843 5.003	29.005
295	29.50-29.99	32.000	29.200	162.000	60.000	50.200	86843 5.003	29.500
295	29.50-29.99	31.750	29.200	162.000	60.000	50.200	86843 5.003	29.505
300	30.00-30.49	32.000	29.700	164.000	60.000	50.900	86843 6.000	30.000
300	30.00-30.49	31.750	29.700	164.000	60.000	50.900	86843 6.000	30.005
305	30.50-30.99	32.000	30.200	166.000	60.000	51.700	86843 6.000	30.500
305	30.50-30.99	31.750	30.200	166.000	60.000	51.700	86843 6.000	30.505
310	31.00-31.49	32.000	30.700	167.000	60.000	52.600	86843 6.000	31.000
310	31.00-31.49	31.750	30.700	167.000	60.000	52.600	86843 6.000	31.005
315	31.50-31.99	32.000	31.200	168.000	60.000	53.400	86843 6.000	31.500
315	31.50-31.99	31.750	31.200	168.000	60.000	53.400	86843 6.000	31.505
320	32.00-32.99	32.000	31.700	172.000	60.000	55.100	86843 6.001	32.000
320	32.00-32.99	31.750	31.700	172.000	60.000	55.100	86843 6.001	32.005
330	33.00-33.99	32.000	32.700	175.000	60.000	56.800	86843 6.001	33.000
330	33.00-33.99	31.750	32.700	175.000	60.000	56.800	86843 6.001	33.005
340	34.00-34.99	32.000	33.700	178.000	60.000	58.500	86843 6.001	34.000
340	34.00-34.99	31.750	33.700	178.000	60.000	58.500	86843 6.001	34.005
350	35.00-35.99	32.000	34.700	181.000	60.000	60.200	86843 6.001	35.000
350	35.00-35.99	31.750	34.700	181.000	60.000	60.200	86843 6.001	35.005
360	36.00-36.99	32.000	35.700	184.000	60.000	61.800	86843 6.002	36.000
360	36.00-36.99	31.750	35.700	184.000	60.000	61.800	86843 6.002	36.005
370	37.00-37.99	32.000	36.700	188.000	60.000	63.500	86843 6.002	37.000
370	37.00-37.99	31.750	36.700	188.000	60.000	63.500	86843 6.002	37.005
380	38.00-38.99	32.000	37.700	191.000	60.000	65.200	86843 6.002	38.000
380	38.00-38.99	31.750	37.700	191.000	60.000	65.200	86843 6.002	38.005
390	39.00-40.00	32.000	38.700	194.000	60.000	66.900	86843 6.002	39.000
390	39.00-40.00	31.750	38.700	194.000	60.000	66.900	86843 6.002	39.005



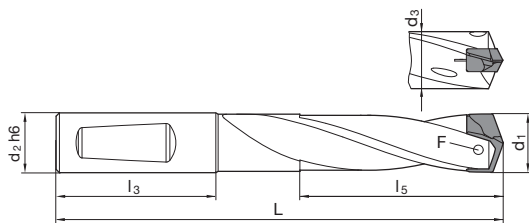
HARTNER

Multiplex HPC holders

Article no. 86683



especially high wear resistance • optimised flute design • especially high rigidity • clamping screws art. no. 86843 included • screwdriver art. no. 86842 included



Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
110	11.00-11.49	12.000	10.700	101.000	45.000	36.600	86843 2.200	11.000
110	11.00-11.49	12.700	10.700	101.000	45.000	36.600	86843 2.200	11.005
115	11.50-11.99	12.000	11.200	103.000	45.000	38.100	86843 2.200	11.500
115	11.50-11.99	12.700	11.200	103.000	45.000	38.100	86843 2.200	11.505
120	12.00-12.49	12.000	11.700	106.000	45.000	39.700	86843 2.201	12.000
120	12.00-12.49	12.700	11.700	106.000	45.000	39.700	86843 2.201	12.005
125	12.50-12.99	14.000	12.200	108.000	45.000	41.300	86843 2.201	12.500
125	12.50-12.99	15.875	12.200	108.000	45.000	41.300	86843 2.201	12.505
130	13.00-13.49	14.000	12.700	110.000	45.000	42.900	86843 2.500	13.000
130	13.00-13.49	15.875	12.700	110.000	45.000	42.900	86843 2.500	13.005
135	13.50-13.99	14.000	13.200	113.000	45.000	44.600	86843 2.500	13.500
135	13.50-13.99	15.875	13.200	113.000	45.000	44.600	86843 2.500	13.505
140	14.00-14.49	14.000	13.700	115.000	45.000	46.200	86843 3.000	14.000
140	14.00-14.49	15.875	13.700	115.000	45.000	46.200	86843 3.000	14.005
145	14.50-14.99	16.000	14.200	120.000	48.000	47.800	86843 3.000	14.500
145	14.50-14.99	15.875	14.200	120.000	48.000	47.800	86843 3.000	14.505
150	15.00-15.49	16.000	14.700	123.000	48.000	49.300	86843 3.001	15.000
150	15.00-15.49	15.875	14.700	123.000	48.000	49.300	86843 3.001	15.005
155	15.50-15.99	16.000	15.200	125.000	48.000	50.900	86843 3.001	15.500
155	15.50-15.99	15.875	15.200	125.000	48.000	50.900	86843 3.001	15.505
160	16.00-16.49	16.000	15.700	127.000	48.000	52.900	86843 3.500	16.000
160	16.00-16.49	15.875	15.700	127.000	48.000	52.900	86843 3.500	16.005
165	16.50-16.99	18.000	16.200	130.000	48.000	54.100	86843 3.500	16.500
165	16.50-16.99	19.050	16.200	130.000	48.000	54.100	86843 3.500	16.505
170	17.00-17.49	18.000	16.700	132.000	48.000	55.800	86843 3.500	17.000
170	17.00-17.49	19.050	16.700	132.000	48.000	55.800	86843 3.500	17.005
175	17.50-17.99	18.000	17.200	134.000	48.000	57.400	86843 3.500	17.500
175	17.50-17.99	19.050	17.200	134.000	48.000	57.400	86843 3.500	17.505
180	18.00-18.49	18.000	17.700	137.000	48.000	58.900	86843 4.000	18.000
180	18.00-18.49	19.050	17.700	137.000	48.000	58.900	86843 4.000	18.005
185	18.50-18.99	20.000	18.200	141.000	50.000	60.500	86843 4.000	18.500
185	18.50-18.99	19.050	18.200	141.000	50.000	60.500	86843 4.000	18.505
190	19.00-19.49	20.000	18.700	143.000	50.000	62.100	86843 4.000	19.000
190	19.00-19.49	19.050	18.700	143.000	50.000	62.100	86843 4.000	19.005
195	19.50-19.99	20.000	19.200	146.000	50.000	63.700	86843 4.000	19.500
195	19.50-19.99	19.050	19.200	146.000	50.000	63.700	86843 4.000	19.505
200	20.00-20.49	20.000	19.700	148.000	50.000	65.300	86843 4.500	20.000
200	20.00-20.49	19.050	19.700	148.000	50.000	65.300	86843 4.500	20.005
205	20.50-20.99	25.000	20.200	159.000	56.000	67.000	86843 4.500	20.500
205	20.50-20.99	25.400	20.200	159.000	56.000	67.000	86843 4.500	20.505
210	21.00-21.49	25.000	20.700	161.000	56.000	68.600	86843 4.500	21.000
210	21.00-21.49	25.400	20.700	161.000	56.000	68.600	86843 4.500	21.005



Multiplex HPC holders

Size mm	d1	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	F	Code no.
215	21.50-21.99	25.000	21.200	163.000	56.000	70.100	86843 4.500	21.500
215	21.50-21.99	25.400	21.200	163.000	56.000	70.100	86843 4.500	21.505
220	22.00-22.49	25.000	21.700	165.000	56.000	71.700	86843 5.000	22.000
220	22.00-22.49	25.400	21.700	165.000	56.000	71.700	86843 5.000	22.005
225	22.50-22.99	25.000	22.200	168.000	56.000	73.300	86843 5.000	22.500
225	22.50-22.99	25.400	22.200	168.000	56.000	73.300	86843 5.000	22.505
230	23.00-23.49	25.000	22.700	170.000	56.000	74.900	86843 5.000	23.000
230	23.00-23.49	25.400	22.700	170.000	56.000	74.900	86843 5.000	23.005
235	23.50-23.99	25.000	23.200	173.000	56.000	76.500	86843 5.000	23.500
235	23.50-23.99	25.400	23.200	173.000	56.000	76.500	86843 5.000	23.505
240	24.00-24.49	25.000	23.700	175.000	56.000	78.100	86843 5.001	24.000
240	24.00-24.49	25.400	23.700	175.000	56.000	78.100	86843 5.001	24.005
245	24.50-24.99	25.000	24.200	177.000	56.000	79.700	86843 5.001	24.500
245	24.50-24.99	25.400	24.200	177.000	56.000	79.700	86843 5.001	24.505
250	25.00-25.49	25.000	24.700	180.000	56.000	81.300	86843 5.001	25.000
250	25.00-25.49	25.400	24.700	180.000	56.000	81.300	86843 5.001	25.005
255	25.50-25.99	32.000	25.200	187.000	60.000	82.900	86843 5.001	25.500
255	25.50-25.99	31.750	25.200	187.000	60.000	82.900	86843 5.001	25.505
260	26.00-26.49	32.000	25.700	191.000	60.000	84.000	86843 5.003	26.000
260	26.00-26.49	31.750	25.700	191.000	60.000	84.000	86843 5.003	26.005
265	26.50-26.99	32.000	26.200	193.000	60.000	86.100	86843 5.003	26.500
265	26.50-26.99	31.750	26.200	193.000	60.000	86.100	86843 5.003	26.505
270	27.00-27.49	32.000	26.700	196.000	60.000	87.200	86843 5.003	27.000
270	27.00-27.49	31.750	26.700	196.000	60.000	87.200	86843 5.003	27.005
275	27.50-27.99	32.000	27.200	198.000	60.000	88.900	86843 5.003	27.500
275	27.50-27.99	31.750	27.200	198.000	60.000	88.900	86843 5.003	27.505
280	28.00-28.49	32.000	27.700	200.000	60.000	90.400	86843 5.003	28.000
280	28.00-28.49	31.750	27.700	200.000	60.000	90.400	86843 5.003	28.005
285	28.50-28.99	32.000	28.200	202.000	60.000	92.500	86843 5.003	28.500
285	28.50-28.99	31.750	28.200	202.000	60.000	92.500	86843 5.003	28.505
290	29.00-29.49	32.000	28.700	205.000	60.000	94.600	86843 5.003	29.000
290	29.00-29.49	31.750	28.700	205.000	60.000	94.600	86843 5.003	29.005
295	29.50-29.99	32.000	29.200	207.000	60.000	95.100	86843 5.003	29.500
295	29.50-29.99	31.750	29.200	207.000	60.000	95.100	86843 5.003	29.505
300	30.00-30.49	32.000	29.700	210.000	60.000	96.700	86843 6.000	30.000
300	30.00-30.49	31.750	29.700	210.000	60.000	96.700	86843 6.000	30.005
305	30.50-30.99	32.000	30.200	212.000	60.000	98.300	86843 6.000	30.500
305	30.50-30.99	31.750	30.200	212.000	60.000	98.300	86843 6.000	30.505
310	31.00-31.49	32.000	30.700	214.000	60.000	99.800	86843 6.000	31.000
310	31.00-31.49	31.750	30.700	214.000	60.000	99.800	86843 6.000	31.005
315	31.50-31.99	32.000	31.200	216.000	60.000	101.400	86843 6.000	31.500
315	31.50-31.99	31.750	31.200	216.000	60.000	101.400	86843 6.000	31.505
320	32.00-32.99	32.000	31.700	221.000	60.000	104.600	86843 6.001	32.000
320	32.00-32.99	31.750	31.700	221.000	60.000	104.600	86843 6.001	32.005
330	33.00-33.99	32.000	32.700	226.000	60.000	107.800	86843 6.001	33.000
330	33.00-33.99	31.750	32.700	226.000	60.000	107.800	86843 6.001	33.005
340	34.00-34.99	32.000	33.700	230.000	60.000	111.000	86843 6.001	34.000
340	34.00-34.99	31.750	33.700	230.000	60.000	111.000	86843 6.001	34.005
350	35.00-35.99	32.000	34.700	235.000	60.000	114.200	86843 6.001	35.000
350	35.00-35.99	31.750	34.700	235.000	60.000	114.200	86843 6.001	35.005
360	36.00-36.99	32.000	35.700	240.000	60.000	117.300	86843 6.002	36.000
360	36.00-36.99	31.750	35.700	240.000	60.000	117.300	86843 6.002	36.005
370	37.00-37.99	32.000	36.700	245.000	60.000	120.500	86843 6.002	37.000
370	37.00-37.99	31.750	36.700	245.000	60.000	120.500	86843 6.002	37.005
380	38.00-38.99	32.000	37.700	249.000	60.000	123.700	86843 6.002	38.000
380	38.00-38.99	31.750	37.700	249.000	60.000	123.700	86843 6.002	38.005
390	39.00-40.00	32.000	38.700	254.000	60.000	126.900	86843 6.002	39.000
390	39.00-40.00	31.750	38.700	254.000	60.000	126.900	86843 6.002	39.005

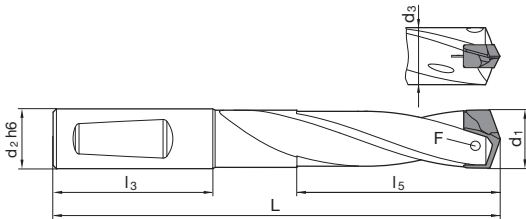


Multiplex HPC holders

Article no. 86684



especially high wear resistance • optimised flute design • especially high rigidity • clamping screws art. no. 86843 included • screwdriver art. no. 86842 included



Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
110	11.00-11.49	12.000	10.700	124.000	45.000	59.600	86843 2.200	11.000
110	11.00-11.49	12.700	10.700	124.000	45.000	59.600	86843 2.200	11.005
115	11.50-11.99	12.000	11.200	127.000	45.000	62.100	86843 2.200	11.500
115	11.50-11.99	12.700	11.200	127.000	45.000	62.100	86843 2.200	11.505
120	12.00-12.49	12.000	11.700	131.000	45.000	64.700	86843 2.201	12.000
120	12.00-12.49	12.700	11.700	131.000	45.000	64.700	86843 2.201	12.005
125	12.50-12.99	14.000	12.200	134.000	45.000	67.300	86843 2.201	12.500
125	12.50-12.99	15.875	12.200	134.000	45.000	67.300	86843 2.201	12.505
130	13.00-13.49	14.000	12.700	137.000	45.000	69.900	86843 2.500	13.000
130	13.00-13.49	15.875	12.700	137.000	45.000	69.900	86843 2.500	13.005
135	13.50-13.99	14.000	13.200	141.000	45.000	72.600	86843 2.500	13.500
135	13.50-13.99	15.875	13.200	141.000	45.000	72.600	86843 2.500	13.505
140	14.00-14.49	14.000	13.700	144.000	45.000	75.200	86843 3.000	14.000
140	14.00-14.49	15.875	13.700	144.000	45.000	75.200	86843 3.000	14.005
145	14.50-14.99	16.000	14.200	150.000	48.000	77.800	86843 3.000	14.500
145	14.50-14.99	15.875	14.200	150.000	48.000	77.800	86843 3.000	14.505
150	15.00-15.49	16.000	14.700	154.000	48.000	80.300	86843 3.001	15.000
150	15.00-15.49	15.875	14.700	154.000	48.000	80.300	86843 3.001	15.005
155	15.50-15.99	16.000	15.200	157.000	48.000	82.900	86843 3.001	15.500
155	15.50-15.99	15.875	15.200	157.000	48.000	82.900	86843 3.001	15.505
160	16.00-16.49	16.000	15.700	160.000	48.000	85.900	86843 3.500	16.000
160	16.00-16.49	15.875	15.700	160.000	48.000	85.900	86843 3.500	16.005
165	16.50-16.99	18.000	16.200	164.000	48.000	88.100	86843 3.500	16.500
165	16.50-16.99	19.050	16.200	164.000	48.000	88.100	86843 3.500	16.505
170	17.00-17.49	18.000	16.700	167.000	48.000	90.800	86843 3.500	17.000
170	17.00-17.49	19.050	16.700	167.000	48.000	90.800	86843 3.500	17.005
175	17.50-17.99	18.000	17.200	170.000	48.000	93.400	86843 3.500	17.500
175	17.50-17.99	19.050	17.200	170.000	48.000	93.400	86843 3.500	17.505
180	18.00-18.49	18.000	17.700	174.000	48.000	95.900	86843 4.000	18.000
180	18.00-18.49	19.050	17.700	174.000	48.000	95.900	86843 4.000	18.005
185	18.50-18.99	20.000	18.200	179.000	50.000	98.500	86843 4.000	18.500
185	18.50-18.99	19.050	18.200	179.000	50.000	98.500	86843 4.000	18.505
190	19.00-19.49	20.000	18.700	182.000	50.000	101.100	86843 4.000	19.000
190	19.00-19.49	19.050	18.700	182.000	50.000	101.100	86843 4.000	19.005
195	19.50-19.99	20.000	19.200	186.000	50.000	103.700	86843 4.000	19.500
195	19.50-19.99	19.050	19.200	186.000	50.000	103.700	86843 4.000	19.505
200	20.00-20.49	20.000	19.700	189.000	50.000	106.300	86843 4.500	20.000
200	20.00-20.49	19.050	19.700	189.000	50.000	106.300	86843 4.500	20.005
205	20.50-20.99	25.000	20.200	201.000	56.000	109.000	86843 4.500	20.500
205	20.50-20.99	25.400	20.200	201.000	56.000	109.000	86843 4.500	20.505
210	21.00-21.49	25.000	20.700	204.000	56.000	111.600	86843 4.500	21.000
210	21.00-21.49	25.400	20.700	204.000	56.000	111.600	86843 4.500	21.005



Multiplex HPC holders

Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
215	21.50-21.99	25.000	21.200	207.000	56.000	114.100	86843 4.500	21.500
215	21.50-21.99	25.400	21.200	207.000	56.000	114.100	86843 4.500	21.505
220	22.00-22.49	25.000	21.700	210.000	56.000	116.700	86843 5.000	22.000
220	22.00-22.49	25.400	21.700	210.000	56.000	116.700	86843 5.000	22.005
225	22.50-22.99	25.000	22.200	214.000	56.000	119.300	86843 5.000	22.500
225	22.50-22.99	25.400	22.200	214.000	56.000	119.300	86843 5.000	22.505
230	23.00-23.49	25.000	22.700	217.000	56.000	121.900	86843 5.000	23.000
230	23.00-23.49	25.400	22.700	217.000	56.000	121.900	86843 5.000	23.005
235	23.50-23.99	25.000	23.200	221.000	56.000	124.500	86843 5.000	23.500
235	23.50-23.99	25.400	23.200	221.000	56.000	124.500	86843 5.000	23.505
240	24.00-24.49	25.000	23.700	224.000	56.000	127.100	86843 5.001	24.000
240	24.00-24.49	25.400	23.700	224.000	56.000	127.100	86843 5.001	24.005
245	24.50-24.99	25.000	24.200	227.000	56.000	129.700	86843 5.001	24.500
245	24.50-24.99	25.400	24.200	227.000	56.000	129.700	86843 5.001	24.505
250	25.00-25.49	25.000	24.700	231.000	56.000	132.300	86843 5.001	25.000
250	25.00-25.49	25.400	24.700	231.000	56.000	132.300	86843 5.001	25.005
255	25.50-25.99	32.000	25.200	239.000	60.000	134.900	86843 5.001	25.500
255	25.50-25.99	31.750	25.200	239.000	60.000	134.900	86843 5.001	25.505
260	26.00-26.49	32.000	25.700	244.000	60.000	137.000	86843 5.003	26.000
265	26.50-26.99	32.000	26.200	247.000	60.000	140.000	86843 5.003	26.500
270	27.00-27.49	32.000	26.700	251.000	60.000	142.200	86843 5.003	27.000
275	27.50-27.99	32.000	27.200	254.000	60.000	144.800	86843 5.003	27.500
280	28.00-28.49	32.000	27.700	257.000	60.000	147.400	86843 5.003	28.000
285	28.50-28.99	32.000	28.200	260.000	60.000	150.400	86843 5.003	28.500
290	29.00-29.49	32.000	28.700	264.000	60.000	153.500	86843 5.003	29.000
295	29.50-29.99	32.000	29.200	267.000	60.000	155.100	86843 5.003	29.500
300	30.00-30.49	32.000	29.700	271.000	60.000	157.600	86843 6.000	30.000
305	30.50-30.99	32.000	30.200	274.000	60.000	160.200	86843 6.000	30.500
310	31.00-31.49	32.000	30.700	277.000	60.000	162.800	86843 6.000	31.000
315	31.50-31.99	32.000	31.200	280.000	60.000	165.400	86843 6.000	31.500
320	32.00-32.99	32.000	31.700	287.000	60.000	170.600	86843 6.001	32.000
330	33.00-33.99	32.000	32.700	294.000	60.000	175.800	86843 6.001	33.000
340	34.00-34.99	32.000	33.700	300.000	60.000	181.000	86843 6.001	34.000
350	35.00-35.99	32.000	34.700	307.000	60.000	186.200	86843 6.001	35.000
360	36.00-36.99	32.000	35.700	314.000	60.000	191.300	86843 6.002	36.000
370	37.00-37.99	32.000	36.700	321.000	60.000	196.500	86843 6.002	37.000
380	38.00-38.99	32.000	37.700	327.000	60.000	201.700	86843 6.002	38.000
390	39.00-40.00	32.000	38.700	334.000	60.000	206.900	86843 6.002	39.000

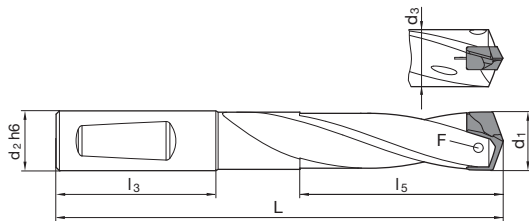


Multiplex HPC holders

Article no. 86685



especially high wear resistance • optimised flute design • especially high rigidity • clamping screws art. no. 86843 included • screwdriver art. no. 86842 included



Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
110	11.00-11.49	12.000	10.700	147.000	45.000	82.600	86843 2.200	11.000
110	11.00-11.49	12.700	10.700	147.000	45.000	82.600	86843 2.200	11.005
115	11.50-11.99	12.000	11.200	151.000	45.000	86.100	86843 2.200	11.500
115	11.50-11.99	12.700	11.200	151.000	45.000	86.100	86843 2.200	11.505
120	12.00-12.49	12.000	11.700	156.000	45.000	89.700	86843 2.201	12.000
120	12.00-12.49	12.700	11.700	156.000	45.000	89.700	86843 2.201	12.005
125	12.50-12.99	14.000	12.200	160.000	45.000	93.300	86843 2.201	12.500
125	12.50-12.99	15.875	12.200	160.000	45.000	93.300	86843 2.201	12.505
130	13.00-13.49	14.000	12.700	164.000	45.000	96.900	86843 2.500	13.000
130	13.00-13.49	15.875	12.700	164.000	45.000	96.900	86843 2.500	13.005
135	13.50-13.99	14.000	13.200	169.000	45.000	100.600	86843 2.500	13.500
135	13.50-13.99	15.875	13.200	169.000	45.000	100.600	86843 2.500	13.505
140	14.00-14.49	14.000	13.700	173.000	45.000	104.200	86843 3.000	14.000
140	14.00-14.49	15.875	13.700	173.000	45.000	104.200	86843 3.000	14.005
145	14.50-14.99	16.000	14.200	180.000	48.000	107.800	86843 3.000	14.500
145	14.50-14.99	15.875	14.200	180.000	48.000	107.800	86843 3.000	14.505
150	15.00-15.49	16.000	14.700	185.000	48.000	111.300	86843 3.001	15.000
150	15.00-15.49	15.875	14.700	185.000	48.000	111.300	86843 3.001	15.005
155	15.50-15.99	16.000	15.200	189.000	48.000	114.900	86843 3.001	15.500
155	15.50-15.99	15.875	15.200	189.000	48.000	114.900	86843 3.001	15.505
160	16.00-16.49	16.000	15.700	193.000	48.000	118.900	86843 3.500	16.000
160	16.00-16.49	15.875	15.700	193.000	48.000	118.900	86843 3.500	16.005
165	16.50-16.99	18.000	16.200	198.000	48.000	122.100	86843 3.500	16.500
165	16.50-16.99	19.050	16.200	198.000	48.000	122.100	86843 3.500	16.505
170	17.00-17.49	18.000	16.700	202.000	48.000	125.800	86843 3.500	17.000
170	17.00-17.49	19.050	16.700	202.000	48.000	125.800	86843 3.500	17.005
175	17.50-17.99	18.000	17.200	206.000	48.000	129.400	86843 3.500	17.500
175	17.50-17.99	19.050	17.200	206.000	48.000	129.400	86843 3.500	17.505
180	18.00-18.49	18.000	17.700	211.000	48.000	132.900	86843 4.000	18.000
180	18.00-18.49	19.050	17.700	211.000	48.000	132.900	86843 4.000	18.005
185	18.50-18.99	20.000	18.200	217.000	50.000	136.500	86843 4.000	18.500
185	18.50-18.99	19.050	18.200	217.000	50.000	136.500	86843 4.000	18.505
190	19.00-19.49	20.000	18.700	221.000	50.000	140.100	86843 4.000	19.000
190	19.00-19.49	19.050	18.700	221.000	50.000	140.100	86843 4.000	19.005
195	19.50-19.99	20.000	19.200	226.000	50.000	143.700	86843 4.000	19.500
195	19.50-19.99	19.050	19.200	226.000	50.000	143.700	86843 4.000	19.505
200	20.00-20.49	20.000	19.700	230.000	50.000	147.300	86843 4.500	20.000
200	20.00-20.49	19.050	19.700	230.000	50.000	147.300	86843 4.500	20.005
205	20.50-20.99	25.000	20.200	243.000	56.000	151.000	86843 4.500	20.500
205	20.50-20.99	25.400	20.200	243.000	56.000	151.000	86843 4.500	20.505
210	21.00-21.49	25.000	20.700	247.000	56.000	154.600	86843 4.500	21.000
210	21.00-21.49	25.400	20.700	247.000	56.000	154.600	86843 4.500	21.005



Multiplex HPC holders

Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
215	21.50-21.99	25.000	21.200	251.000	56.000	158.100	86843 4.500	21.500
215	21.50-21.99	25.400	21.200	251.000	56.000	158.100	86843 4.500	21.505
220	22.00-22.49	25.000	21.700	255.000	56.000	161.700	86843 5.000	22.000
220	22.00-22.49	25.400	21.700	255.000	56.000	161.700	86843 5.000	22.005
225	22.50-22.99	25.000	22.200	260.000	56.000	165.300	86843 5.000	22.500
225	22.50-22.99	25.400	22.200	260.000	56.000	165.300	86843 5.000	22.505
230	23.00-23.49	25.000	22.700	264.000	56.000	168.900	86843 5.000	23.000
230	23.00-23.49	25.400	22.700	264.000	56.000	168.900	86843 5.000	23.005
235	23.50-23.99	25.000	23.200	269.000	56.000	172.500	86843 5.000	23.500
235	23.50-23.99	25.400	23.200	269.000	56.000	172.500	86843 5.000	23.505
240	24.00-24.49	25.000	23.700	273.000	56.000	176.100	86843 5.001	24.000
240	24.00-24.49	25.400	23.700	273.000	56.000	176.100	86843 5.001	24.005
245	24.50-24.99	25.000	24.200	277.000	56.000	179.700	86843 5.001	24.500
245	24.50-24.99	25.400	24.200	277.000	56.000	179.700	86843 5.001	24.505
250	25.00-25.49	25.000	24.700	282.000	56.000	183.300	86843 5.001	25.000
250	25.00-25.49	25.400	24.700	282.000	56.000	183.300	86843 5.001	25.005
255	25.50-25.99	32.000	25.200	291.000	60.000	186.900	86843 5.001	25.500
255	25.50-25.99	31.750	25.200	291.000	60.000	186.900	86843 5.001	25.505
260	26.00-26.49	32.000	25.700	297.000	60.000	190.000	86843 5.003	26.000
260	26.00-26.49	31.750	25.700	297.000	60.000	190.000	86843 5.003	26.005
265	26.50-26.99	32.000	26.200	301.000	60.000	194.000	86843 5.003	26.500
265	26.50-26.99	31.750	26.200	301.000	60.000	194.000	86843 5.003	26.505
270	27.00-27.49	32.000	26.700	306.000	60.000	197.200	86843 5.003	27.000
270	27.00-27.49	31.750	26.700	306.000	60.000	197.200	86843 5.003	27.005
275	27.50-27.99	32.000	27.200	310.000	60.000	200.800	86843 5.003	27.500
275	27.50-27.99	31.750	27.200	310.000	60.000	200.800	86843 5.003	27.505
280	28.00-28.49	32.000	27.700	314.000	60.000	204.400	86843 5.003	28.000
280	28.00-28.49	31.750	27.700	314.000	60.000	204.400	86843 5.003	28.005
285	28.50-28.99	32.000	28.200	318.000	60.000	208.400	86843 5.003	28.500
285	28.50-28.99	31.750	28.200	318.000	60.000	208.400	86843 5.003	28.505
290	29.00-29.49	32.000	28.700	323.000	60.000	212.500	86843 5.003	29.000
290	29.00-29.49	31.750	28.700	323.000	60.000	212.500	86843 5.003	29.005
295	29.50-29.99	32.000	29.200	327.000	60.000	215.100	86843 5.003	29.500
295	29.50-29.99	31.750	29.200	327.000	60.000	215.100	86843 5.003	29.505
300	30.00-30.49	32.000	29.700	332.000	60.000	218.600	86843 6.000	30.000
300	30.00-30.49	31.750	29.700	332.000	60.000	218.600	86843 6.000	30.005
305	30.50-30.99	32.000	30.200	336.000	60.000	222.200	86843 6.000	30.500
305	30.50-30.99	31.750	30.200	336.000	60.000	222.200	86843 6.000	30.505
310	31.00-31.49	32.000	30.700	340.000	60.000	225.800	86843 6.000	31.000
310	31.00-31.49	31.750	30.700	340.000	60.000	225.800	86843 6.000	31.005
315	31.50-31.99	32.000	31.200	344.000	60.000	229.400	86843 6.000	31.500
315	31.50-31.99	31.750	31.200	344.000	60.000	229.400	86843 6.000	31.505

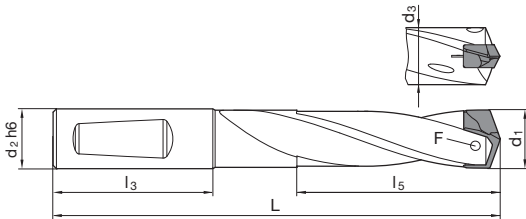


Multiplex HPC holders

Article no. 86686



especially high wear resistance • optimised flute design • especially high rigidity • clamping screws art. no. 86843 included • screwdriver art. no. 86842 included



Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
110	11.00-11.49	12.000	10.700	182.000	45.000	117.100	86843 2.200	11.000
110	11.00-11.49	12.700	10.700	182.000	45.000	117.100	86843 2.200	11.005
115	11.50-11.99	12.000	11.200	187.000	45.000	122.100	86843 2.200	11.500
115	11.50-11.99	12.700	11.200	187.000	45.000	122.100	86843 2.200	11.505
120	12.00-12.49	12.000	11.700	194.000	45.000	127.200	86843 2.201	12.000
120	12.00-12.49	12.700	11.700	194.000	45.000	127.200	86843 2.201	12.005
125	12.50-12.99	14.000	12.200	199.000	45.000	132.300	86843 2.201	12.500
125	12.50-12.99	15.875	12.200	199.000	45.000	132.300	86843 2.201	12.505
130	13.00-13.49	14.000	12.700	205.000	45.000	137.500	86843 2.500	13.000
130	13.00-13.49	15.875	12.700	205.000	45.000	137.500	86843 2.500	13.005
135	13.50-13.99	14.000	13.200	211.000	45.000	142.500	86843 2.500	13.500
135	13.50-13.99	15.875	13.200	211.000	45.000	142.500	86843 2.500	13.505
140	14.00-14.49	14.000	13.700	217.000	45.000	147.700	86843 3.000	14.000
140	14.00-14.49	15.875	13.700	217.000	45.000	147.700	86843 3.000	14.005
145	14.50-14.99	16.000	14.200	225.000	48.000	152.800	86843 3.000	14.500
145	14.50-14.99	15.875	14.200	225.000	48.000	152.800	86843 3.000	14.505
150	15.00-15.49	16.000	14.700	232.000	48.000	157.800	86843 3.001	15.000
150	15.00-15.49	15.875	14.700	232.000	48.000	157.800	86843 3.001	15.005
155	15.50-15.99	16.000	15.200	237.000	48.000	162.900	86843 3.001	15.500
155	15.50-15.99	15.875	15.200	237.000	48.000	162.900	86843 3.001	15.505
160	16.00-16.49	16.000	15.700	243.000	48.000	168.000	86843 3.500	16.000
160	16.00-16.49	15.875	15.700	243.000	48.000	168.000	86843 3.500	16.005
165	16.50-16.99	18.000	16.200	249.000	48.000	170.000	86843 3.500	16.500
165	16.50-16.99	19.050	16.200	249.000	48.000	170.000	86843 3.500	16.505
170	17.00-17.49	18.000	16.700	255.000	48.000	178.300	86843 3.500	17.000
170	17.00-17.49	19.050	16.700	255.000	48.000	178.300	86843 3.500	17.005
175	17.50-17.99	18.000	17.200	260.000	48.000	183.500	86843 3.500	17.500
175	17.50-17.99	19.050	17.200	260.000	48.000	183.500	86843 3.500	17.505
180	18.00-18.49	18.000	17.700	267.000	48.000	188.400	86843 4.000	18.000
180	18.00-18.49	19.050	17.700	267.000	48.000	188.400	86843 4.000	18.005
185	18.50-18.99	20.000	18.200	274.000	50.000	193.500	86843 4.000	18.500
185	18.50-18.99	19.050	18.200	274.000	50.000	193.500	86843 4.000	18.505
190	19.00-19.49	20.000	18.700	280.000	50.000	198.700	86843 4.000	19.000
190	19.00-19.49	19.050	18.700	280.000	50.000	198.700	86843 4.000	19.005
195	19.50-19.99	20.000	19.200	286.000	50.000	203.700	86843 4.000	19.500
195	19.50-19.99	19.050	19.200	286.000	50.000	203.700	86843 4.000	19.505
200	20.00-20.49	20.000	19.700	292.000	50.000	208.900	86843 4.500	20.000
200	20.00-20.49	19.050	19.700	292.000	50.000	208.900	86843 4.500	20.005
205	20.50-20.99	25.000	20.200	306.000	56.000	214.000	86843 4.500	20.500
205	20.50-20.99	25.400	20.200	306.000	56.000	214.000	86843 4.500	20.505
210	21.00-21.49	25.000	20.700	312.000	56.000	219.100	86843 4.500	21.000
210	21.00-21.49	25.400	20.700	312.000	56.000	219.100	86843 4.500	21.005



Multiplex HPC holders

Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
215	21.50-21.99	25.000	21.200	317.000	56.000	224.200	86843 4.500	21.500
215	21.50-21.99	25.400	21.200	317.000	56.000	224.200	86843 4.500	21.505
220	22.00-22.49	25.000	21.700	323.000	56.000	229.300	86843 5.000	22.000
220	22.00-22.49	25.400	21.700	323.000	56.000	229.300	86843 5.000	22.005
225	22.50-22.99	25.000	22.200	329.000	56.000	234.400	86843 5.000	22.500
225	22.50-22.99	25.400	22.200	329.000	56.000	234.400	86843 5.000	22.505
230	23.00-23.49	25.000	22.700	335.000	56.000	239.500	86843 5.000	23.000
230	23.00-23.49	25.400	22.700	335.000	56.000	239.500	86843 5.000	23.005
235	23.50-23.99	25.000	23.200	341.000	56.000	244.600	86843 5.000	23.500
235	23.50-23.99	25.400	23.200	341.000	56.000	244.600	86843 5.000	23.505
240	24.00-24.49	25.000	23.700	347.000	56.000	249.700	86843 5.001	24.000
240	24.00-24.49	25.400	23.700	347.000	56.000	249.700	86843 5.001	24.005
245	24.50-24.99	25.000	24.200	352.000	56.000	254.800	86843 5.001	24.500
245	24.50-24.99	25.400	24.200	352.000	56.000	254.800	86843 5.001	24.505
250	25.00-25.49	25.000	24.700	359.000	56.000	259.900	86843 5.001	25.000
250	25.00-25.49	25.400	24.700	359.000	56.000	259.900	86843 5.001	25.005
255	25.50-25.99	32.000	25.200	369.000	60.000	265.000	86843 5.001	25.500
255	25.50-25.99	31.750	25.200	369.000	60.000	265.000	86843 5.001	25.505
260	26.00-26.49	32.000	25.700	377.000	60.000	270.000	86843 5.003	26.000
260	26.00-26.49	31.750	25.700	377.000	60.000	270.000	86843 5.003	26.005
265	26.50-26.99	32.000	26.200	382.000	60.000	275.000	86843 5.003	26.500
265	26.50-26.99	31.750	26.200	382.000	60.000	275.000	86843 5.003	26.505
270	27.00-27.49	32.000	26.700	388.000	60.000	280.100	86843 5.003	27.000
270	27.00-27.49	31.750	26.700	388.000	60.000	280.100	86843 5.003	27.005
275	27.50-27.99	32.000	27.200	394.000	60.000	285.200	86843 5.003	27.500
275	27.50-27.99	31.750	27.200	394.000	60.000	285.200	86843 5.003	27.505
280	28.00-28.49	32.000	27.700	400.000	60.000	290.300	86843 5.003	28.000
280	28.00-28.49	31.750	27.700	400.000	60.000	290.300	86843 5.003	28.005
285	28.50-28.99	32.000	28.200	405.000	60.000	295.400	86843 5.003	28.500
285	28.50-28.99	31.750	28.200	405.000	60.000	295.400	86843 5.003	28.505
290	29.00-29.49	32.000	28.700	412.000	60.000	300.500	86843 5.003	29.000
290	29.00-29.49	31.750	28.700	412.000	60.000	300.500	86843 5.003	29.005
295	29.50-29.99	32.000	29.200	418.000	60.000	305.600	86843 5.003	29.500
295	29.50-29.99	31.750	29.200	418.000	60.000	305.600	86843 5.003	29.505
300	30.00-30.49	32.000	29.700	424.000	60.000	310.600	86843 6.000	30.000
300	30.00-30.49	31.750	29.700	424.000	60.000	310.600	86843 6.000	30.005
305	30.50-30.99	32.000	30.200	429.000	60.000	315.700	86843 6.000	30.500
305	30.50-30.99	31.750	30.200	429.000	60.000	315.700	86843 6.000	30.505
310	31.00-31.49	32.000	30.700	435.000	60.000	320.800	86843 6.000	31.000
310	31.00-31.49	31.750	30.700	435.000	60.000	320.800	86843 6.000	31.005
315	31.50-31.99	32.000	31.200	441.000	60.000	325.900	86843 6.000	31.500
315	31.50-31.99	31.750	31.200	441.000	60.000	325.900	86843 6.000	31.505

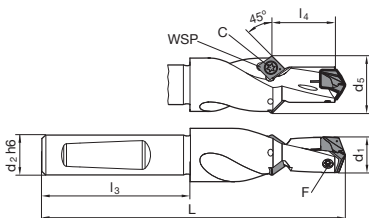


Multiplex HPC holders

Article no. 86681



especially high wear resistance • optimised flute design • optimised coolant duct exit • clamping screws art.-no. 86843 and 86846 included • screwdriver art. no. 86842 included
for piloting and countersinking 45°



Size mm	d1	d2 h6 mm	d5 mm	L mm	l3 mm	l4 mm	F	C	Code no.
110	11.00-11.99	12.000	17.000	81.000	45.000	12.000	86843 2.200	86846 2.000	11.000
110	11.00-11.99	12.700	17.000	81.000	45.000	12.000	86843 2.200	86846 2.000	11.005
120	12.00-12.99	12.000	18.000	84.000	45.000	13.000	86843 2.201	86846 2.000	12.000
120	12.00-12.99	12.700	18.000	84.000	45.000	13.000	86843 2.201	86846 2.000	12.005
130	13.00-13.99	14.000	18.000	86.000	45.000	14.000	86843 2.500	86846 2.000	13.000
130	13.00-13.99	15.875	18.000	86.000	45.000	14.000	86843 2.500	86846 2.000	13.005
140	14.00-15.99	16.000	18.000	93.000	48.000	16.000	86843 3.000	86846 2.000	14.000
140	14.00-15.99	15.875	18.000	93.000	48.000	16.000	86843 3.000	86846 2.000	14.005
160	16.00-17.99	18.000	20.000	99.000	48.000	18.000	86843 3.500	86846 2.500	16.000
160	16.00-17.99	19.050	20.000	99.000	48.000	18.000	86843 3.500	86846 2.500	16.005
180	18.00-19.99	20.000	22.000	106.000	50.000	20.000	86843 4.000	86846 2.500	18.000
180	18.00-19.99	19.050	22.000	106.000	50.000	20.000	86843 4.000	86846 2.500	18.005
200	20.00-21.99	25.000	25.000	117.000	56.000	22.000	86843 4.500	86846 2.500	20.000
200	20.00-21.99	25.400	25.400	117.000	56.000	22.000	86843 4.500	86846 2.500	20.005
220	22.00-23.99	25.000	26.000	122.000	56.000	24.000	86843 5.000	86846 2.500	22.000
220	22.00-23.99	25.400	26.000	122.000	56.000	24.000	86843 5.000	86846 2.500	22.005
240	24.00-25.99	25.000	28.000	128.000	56.000	26.000	86843 5.001	86846 2.500	24.000
240	24.00-25.99	25.400	28.000	128.000	56.000	26.000	86843 5.001	86846 2.500	24.005
260	26.00-27.99	32.000	32.000	142.000	60.000	28.000	86843 5.003	86846 2.500	26.000
260	26.00-27.99	31.750	32.000	142.000	60.000	28.000	86843 5.003	86846 2.500	26.005
280	28.00-29.99	32.000	34.000	147.000	60.000	30.000	86843 5.003	86846 2.500	28.000
280	28.00-29.99	31.750	34.000	147.000	60.000	30.000	86843 5.003	86846 2.500	28.005
300	30.00-31.99	32.000	38.000	152.000	60.000	32.000	86843 6.000	86846 4.006	30.000
300	30.00-31.99	31.750	38.000	152.000	60.000	32.000	86843 6.000	86846 4.006	30.005
320	32.00-35.99	32.000	42.000	163.000	60.000	36.000	86843 6.001	86846 4.006	32.000
320	32.00-35.99	31.750	42.000	163.000	60.000	36.000	86843 6.001	86846 4.006	32.005
360	36.00-40.00	32.000	46.000	173.000	60.000	40.000	86843 6.002	86846 4.006	36.000
360	36.00-40.00	31.750	46.000	173.000	60.000	40.000	86843 6.002	86846 4.006	36.005



Multiplex HPC interchangeable inserts

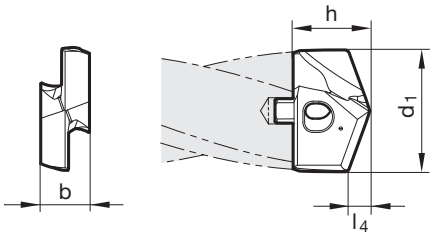
Article no. 86722



P	M	K	N	S	H
●	○	○			



web thinning $\geq \varnothing 11.000$ • facet point grind • main cutting edge form straight (after correction) • clamping screws art. no. 86843 included
 structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm²



Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
110	11.000		2.100	4.500	7.500	11.000
110	11.200		2.100	4.500	7.500	11.200
115	11.500		2.100	4.500	7.500	11.500
115	11.510	29/64	2.100	4.500	7.500	11.510
115	11.700		2.200	4.500	7.500	11.700
115	11.800		2.200	4.500	7.500	11.800
115	11.910	15/32	2.200	4.500	7.500	11.910
120	12.000		2.200	5.000	7.700	12.000
120	12.100		2.300	5.000	7.700	12.100
120	12.200		2.300	5.000	7.700	12.200
120	12.300	31/64	2.300	5.000	7.700	12.300
125	12.500		2.300	5.000	7.700	12.500
125	12.600		2.300	5.000	7.700	12.600
125	12.700	1/2	2.400	5.000	7.700	12.700
125	12.800		2.400	5.000	7.700	12.800
125	12.900		2.400	5.000	7.700	12.900
130	13.000		2.400	5.500	8.500	13.000
130	13.100	33/64	2.400	5.500	8.500	13.100
130	13.490	17/32	2.500	5.500	8.500	13.490
135	13.500		2.500	5.500	8.500	13.500
135	13.600		2.500	5.500	8.500	13.600
135	13.700		2.500	5.500	8.500	13.700
135	13.800		2.600	5.500	8.500	13.800
135	13.890	35/64	2.600	5.500	8.500	13.890
140	14.000		2.600	6.000	9.600	14.000
140	14.100		2.600	6.000	9.600	14.100
140	14.290	9/16	2.700	6.000	9.600	14.290
140	14.400		2.700	6.000	9.600	14.400
145	14.500		2.700	6.000	9.600	14.500
145	14.600		2.700	6.000	9.600	14.600
145	14.680	37/64	2.700	6.000	9.600	14.680
145	14.700		2.700	6.000	9.600	14.700
145	14.800		2.700	6.000	9.600	14.800
150	15.000		2.800	6.000	9.800	15.000
150	15.080	19/32	2.800	6.000	9.800	15.080
150	15.100		2.800	6.000	9.800	15.100
150	15.200		2.800	6.000	9.800	15.200
150	15.300		2.800	6.000	9.800	15.300
150	15.480	39/64	2.900	6.000	9.800	15.480
155	15.500		2.900	6.000	9.800	15.500
155	15.600		2.900	6.000	9.800	15.600
155	15.700		2.900	6.000	9.800	15.700



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
155	15.800		2.900	6.000	9.800	15.800
155	15.870	5/8	2.900	6.000	9.800	15.870
160	16.000		3.000	7.000	11.000	16.000
160	16.270	41/64	3.000	7.000	11.000	16.270
165	16.500		3.100	7.000	11.000	16.500
165	16.670	21/32	3.100	7.000	11.000	16.670
170	17.000		3.100	7.000	11.000	17.000
170	17.070	43/64	3.200	7.000	11.000	17.070
170	17.460	11/16	3.200	7.000	11.000	17.460
175	17.500		3.200	7.000	11.000	17.500
175	17.600		3.300	7.000	11.000	17.600
175	17.860	45/64	3.300	7.000	11.000	17.860
180	18.000		3.300	8.000	12.600	18.000
180	18.260	23/32	3.400	8.000	12.600	18.260
185	18.500		3.400	8.000	12.600	18.500
185	18.650	47/64	3.400	8.000	12.600	18.650
190	19.000		3.500	8.000	12.600	19.000
190	19.050	3/4	3.500	8.000	12.600	19.050
190	19.250		3.600	8.000	12.600	19.250
190	19.450	49/64	3.600	8.000	12.600	19.450
195	19.500		3.600	8.000	12.600	19.500
195	19.600		3.600	8.000	12.600	19.600
195	19.840	25/32	3.700	8.000	12.600	19.840
200	20.000		3.700	9.000	13.900	20.000
200	20.240	51/64	3.700	9.000	13.900	20.240
205	20.500		3.800	9.000	13.900	20.500
205	20.640	13/16	3.800	9.000	13.900	20.640
210	21.000		3.900	9.000	13.900	21.000
210	21.030	53/64	3.900	9.000	13.900	21.030
210	21.100		3.900	9.000	13.900	21.100
210	21.430	27/32	3.900	9.000	13.900	21.430
215	21.500		4.000	9.000	13.900	21.500
215	21.830	55/64	4.000	9.000	13.900	21.830
220	22.000		4.100	10.000	15.300	22.000
220	22.220	7/8	4.100	10.000	15.300	22.220
225	22.500		4.100	10.000	15.300	22.500
225	22.620	57/64	4.200	10.000	15.300	22.620
230	23.000		4.200	10.000	15.300	23.000
230	23.020	29/32	4.200	10.000	15.300	23.020
230	23.420	59/64	4.300	10.000	15.300	23.420
235	23.500		4.300	10.000	15.300	23.500
235	23.810	15/16	4.400	10.000	15.300	23.810
240	24.000		4.400	11.000	15.800	24.000
240	24.100		4.400	11.000	15.800	24.100
240	24.210	61/64	4.500	11.000	15.800	24.210
245	24.500		4.500	11.000	15.800	24.500
245	24.610	31/32	4.500	11.000	15.800	24.610
250	25.000	63/64	4.600	11.000	15.800	25.000
250	25.400	1	4.700	11.000	15.800	25.400
255	25.500		4.700	11.000	15.800	25.500
255	25.670		4.700	11.000	15.800	25.670
255	25.700		4.700	11.000	15.800	25.700
255	25.810		4.700	11.000	15.800	25.810
260	26.000		4.800	12.000	20.000	26.000
260	26.190	1 1/32	4.800	12.000	20.000	26.190
265	26.500		4.900	12.000	20.000	26.500
265	26.590	1 3/64	4.900	12.000	20.000	26.590
270	27.000		5.000	12.000	20.000	27.000
275	27.500		5.100	12.000	20.000	27.500
275	27.700		5.100	12.000	20.000	27.700
275	27.780	1 3/32	5.100	12.000	20.000	27.780
280	28.000		5.100	13.000	20.700	28.000
280	28.180	1 7/64	5.200	13.000	20.700	28.180
285	28.500		5.200	13.000	20.700	28.500
285	28.580		5.300	13.000	20.700	28.580
290	29.000		5.300	13.000	20.700	29.000
290	29.370	1 5/32	5.400	13.000	20.700	29.370
295	29.500		5.400	13.000	20.700	29.500
295	29.770	1 11/64	5.500	13.000	20.700	29.770
300	30.000		5.500	14.000	22.300	30.000
300	30.160	1 3/16	5.500	14.000	22.300	30.160
305	30.500		5.600	14.000	22.300	30.500



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
305	30.960	1 7/32	5.700	14.000	22.300	30.960
310	31.000		5.700	14.000	22.300	31.000
315	31.500		5.800	14.000	22.300	31.500
315	31.750	1 1/4	5.800	14.000	22.300	31.750
320	32.000		5.900	15.000	23.100	32.000
320	32.500		6.000	15.000	23.100	32.500
320	32.540	1 9/32	6.000	15.000	23.100	32.540
320	32.940	1 19/64	6.000	15.000	23.100	32.940
330	33.000		6.100	15.000	23.100	33.000
330	33.340	1 5/16	6.100	15.000	23.100	33.340
330	33.500		6.100	15.000	23.100	33.500
340	34.000		6.200	15.000	23.100	34.000
340	34.130	1 11/32	6.300	15.000	23.100	34.130
340	34.500		6.300	15.000	23.100	34.500
340	34.930		6.400	15.000	23.100	34.930
350	35.000		6.400	15.000	23.100	35.000
350	35.500		6.500	15.000	23.100	35.500
350	35.720	1 13/32	6.600	15.000	23.100	35.720
360	36.000		6.600	16.000	23.900	36.000
360	36.500		6.700	16.000	23.900	36.500
360	36.510	1 7/16	6.700	16.000	23.900	36.510
370	37.000		6.800	16.000	23.900	37.000
370	37.310	1 15/32	6.800	16.000	23.900	37.310
370	37.500		6.900	16.000	23.900	37.500
380	38.000		7.000	16.000	23.900	38.000
380	38.100	1 1/2	7.000	16.000	23.900	38.100
380	38.500	1 33/64	7.100	16.000	23.900	38.500
390	39.000		7.100	16.000	23.900	39.000
390	39.500		7.200	16.000	23.900	39.500
400	40.000		7.300	16.000	23.900	40.000



APPLICATION EXAMPLE STEEL FLANGE

Tool type	Multiplex HPC
Article no. insert	86722
Article no. holder	86683
Diameter	26 mm
Drilling depth	80 mm
Material	36NiCrMo6
Cooling	IK 20 bar
Lubricant	Soluble oil
Machine	Machining centre
v_c	100 m/min
f	0.4 mm/rev.
Tool life	40 m



Multiplex HPC interchangeable inserts

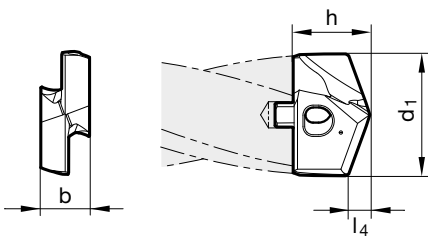
Article no. 86725



P	M	K	N	S	H
○	●			○	○



web thinning $\geq \varnothing 11.000$ • relieved cone • main cutting edge form straight (after correction) • clamping screws art. no. 86843 included stainless steels



Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
110	11.000		2.100	4.500	7.500	11.000
110	11.200		2.100	4.500	7.500	11.200
115	11.500		2.100	4.500	7.500	11.500
115	11.510	29/64	2.100	4.500	7.500	11.510
115	11.700		2.200	4.500	7.500	11.700
115	11.800		2.200	4.500	7.500	11.800
115	11.910	15/32	2.200	4.500	7.500	11.910
120	12.000		2.200	5.000	7.700	12.000
120	12.100		2.300	5.000	7.700	12.100
120	12.200		2.300	5.000	7.700	12.200
120	12.300	31/64	2.300	5.000	7.700	12.300
125	12.500		2.300	5.000	7.700	12.500
125	12.600		2.300	5.000	7.700	12.600
125	12.700	1/2	2.400	5.000	7.700	12.700
125	12.800		2.400	5.000	7.700	12.800
125	12.900		2.400	5.000	7.700	12.900
130	13.000		2.400	5.500	8.500	13.000
130	13.100	33/64	2.400	5.500	8.500	13.100
130	13.490	17/32	2.500	5.500	8.500	13.490
135	13.500		2.500	5.500	8.500	13.500
135	13.600		2.500	5.500	8.500	13.600
135	13.700		2.500	5.500	8.500	13.700
135	13.800		2.600	5.500	8.500	13.800
135	13.890	35/64	2.600	5.500	8.500	13.890
140	14.000		2.600	6.000	9.600	14.000
140	14.100		2.600	6.000	9.600	14.100
140	14.290	9/16	2.700	6.000	9.600	14.290
140	14.400		2.700	6.000	9.600	14.400
145	14.500		2.700	6.000	9.600	14.500
145	14.600		2.700	6.000	9.600	14.600
145	14.700		2.700	6.000	9.600	14.700
145	14.800		2.700	6.000	9.600	14.800
150	15.000		2.800	6.000	9.800	15.000
150	15.080	19/32	2.800	6.000	9.800	15.080
150	15.100		2.800	6.000	9.800	15.100
150	15.200		2.800	6.000	9.800	15.200
150	15.300		2.800	6.000	9.800	15.300
155	15.500		2.900	6.000	9.800	15.500
155	15.600		2.900	6.000	9.800	15.600
155	15.700		2.900	6.000	9.800	15.700
155	15.800		2.900	6.000	9.800	15.800
155	15.870	5/8	2.900	6.000	9.800	15.870



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
160	16.000		3.000	7.000	11.000	16.000
160	16.270	41/64	3.000	7.000	11.000	16.270
165	16.500		3.100	7.000	11.000	16.500
165	16.670	21/32	3.100	7.000	11.000	16.670
170	17.000		3.100	7.000	11.000	17.000
170	17.070	43/64	3.200	7.000	11.000	17.070
170	17.460	11/16	3.200	7.000	11.000	17.460
175	17.500		3.200	7.000	11.000	17.500
175	17.600		3.300	7.000	11.000	17.600
175	17.860	45/64	3.300	7.000	11.000	17.860
180	18.000		3.300	8.000	12.600	18.000
180	18.260	23/32	3.400	8.000	12.600	18.260
185	18.500		3.400	8.000	12.600	18.500
185	18.650	47/64	3.400	8.000	12.600	18.650
190	19.000		3.500	8.000	12.600	19.000
190	19.050	3/4	3.500	8.000	12.600	19.050
190	19.450	49/64	3.600	8.000	12.600	19.450
195	19.500		3.600	8.000	12.600	19.500
195	19.600		3.600	8.000	12.600	19.600
195	19.840	25/32	3.700	8.000	12.600	19.840
200	20.000		3.700	9.000	13.900	20.000
200	20.240	51/64	3.700	9.000	13.900	20.240
205	20.500		3.800	9.000	13.900	20.500
205	20.640	13/16	3.800	9.000	13.900	20.640
210	21.000		3.900	9.000	13.900	21.000
210	21.030	53/64	3.900	9.000	13.900	21.030
210	21.100		3.900	9.000	13.900	21.100
210	21.430	27/32	3.900	9.000	13.900	21.430
215	21.500		4.000	9.000	13.900	21.500
215	21.830	55/64	4.000	9.000	13.900	21.830
220	22.000		4.100	10.000	15.300	22.000
220	22.220	7/8	4.100	10.000	15.300	22.220
225	22.500		4.100	10.000	15.300	22.500
225	22.620	57/64	4.200	10.000	15.300	22.620
230	23.000		4.200	10.000	15.300	23.000
230	23.020	29/32	4.200	10.000	15.300	23.020
230	23.420	59/64	4.300	10.000	15.300	23.420
235	23.500		4.300	10.000	15.300	23.500
235	23.810	15/16	4.400	10.000	15.300	23.810
240	24.000		4.400	11.000	15.800	24.000
240	24.100		4.400	11.000	15.800	24.100
240	24.210	61/64	4.500	11.000	15.800	24.210
245	24.500		4.500	11.000	15.800	24.500
245	24.610	31/32	4.500	11.000	15.800	24.610
250	25.000	63/64	4.600	11.000	15.800	25.000
250	25.400	1	4.700	11.000	15.800	25.400
255	25.500		4.700	11.000	15.800	25.500
255	25.670		4.700	11.000	15.800	25.670
255	25.700		4.700	11.000	15.800	25.700
260	26.000		4.800	12.000	20.000	26.000
260	26.190	1 1/32	4.800	12.000	20.000	26.190
265	26.500		4.900	12.000	20.000	26.500
265	26.590	1 3/64	4.900	12.000	20.000	26.590
270	27.000		5.000	12.000	20.000	27.000
275	27.500		5.100	12.000	20.000	27.500
275	27.700		5.100	12.000	20.000	27.700
275	27.780	1 3/32	5.100	12.000	20.000	27.780
280	28.000		5.100	13.000	20.700	28.000
280	28.180	1 7/64	5.200	13.000	20.700	28.180
285	28.500		5.200	13.000	20.700	28.500
285	28.580		5.300	13.000	20.700	28.580
290	29.000		5.300	13.000	20.700	29.000
290	29.370	1 5/32	5.400	13.000	20.700	29.370
295	29.500		5.400	13.000	20.700	29.500
295	29.600		5.400	13.000	20.700	29.600
295	29.770	1 11/64	5.500	13.000	20.700	29.770
300	30.000		5.500	14.000	22.300	30.000
300	30.160	1 3/16	5.500	14.000	22.300	30.160
305	30.500		5.600	14.000	22.300	30.500
305	30.960	1 7/32	5.700	14.000	22.300	30.960
310	31.000		5.700	14.000	22.300	31.000
315	31.500		5.800	14.000	22.300	31.500



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
315	31.750	1 1/4	5.800	14.000	22.300	31.750
320	32.000		5.900	15.000	23.100	32.000
320	32.500		6.000	15.000	23.100	32.500
320	32.540	1 9/32	6.000	15.000	23.100	32.540
320	32.940	1 19/64	6.000	15.000	23.100	32.940
330	33.000		6.100	15.000	23.100	33.000
330	33.340	1 5/16	6.100	15.000	23.100	33.340
330	33.500		6.100	15.000	23.100	33.500
340	34.000		6.200	15.000	23.100	34.000
340	34.130	1 11/32	6.300	15.000	23.100	34.130
340	34.500		6.300	15.000	23.100	34.500
340	34.930		6.400	15.000	23.100	34.930
350	35.000		6.400	15.000	23.100	35.000
350	35.500		6.500	15.000	23.100	35.500
350	35.720	1 13/32	6.600	15.000	23.100	35.720
360	36.000		6.600	16.000	23.900	36.000
360	36.500		6.700	16.000	23.900	36.500
360	36.510	1 7/16	6.700	16.000	23.900	36.510
370	37.000		6.800	16.000	23.900	37.000
370	37.310	1 15/32	6.800	16.000	23.900	37.310
370	37.500		6.900	16.000	23.900	37.500
380	38.000		7.000	16.000	23.900	38.000
380	38.100	1 1/2	7.000	16.000	23.900	38.100
380	38.500	1 33/64	7.100	16.000	23.900	38.500
390	39.000		7.100	16.000	23.900	39.000
390	39.500		7.200	16.000	23.900	39.500
400	40.000		7.300	16.000	23.900	40.000



APPLICATION EXAMPLE STAINLESS STEEL FLANGE

Tool type	Multiplex HPC
Article no. insert	86725
Article no. holder	86684
Diameter	17 mm
Drilling depth	90 mm
Material	X6CrNiMoTi 17-12-2
Cooling	IK 40 bar
Lubricant	Soluble oil
Machine	Machining centre
v_c	40 m/min
f	0.15 mm/rev.
Tool life	22.5 m



Multiplex HPC interchangeable inserts

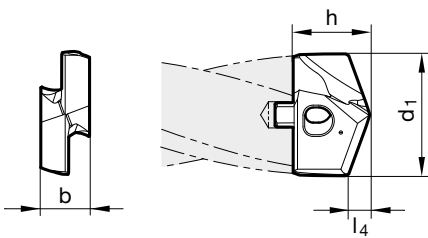
Article no. 86723



P	M	K	N	S	H
○		●			



web thinning $\geq \varnothing 11.000$ • facet point grind • main cutting edge form straight (after correction) • clamping screws art. no. 86843 included
 vermicular cast iron GGK • grey cast iron, malleable and spheroidal iron



Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
110	11.000		2.600	4.500	7.500	11.000
110	11.200		2.600	4.500	7.500	11.200
115	11.500		2.700	4.500	7.500	11.500
115	11.510	29/64	2.700	4.500	7.500	11.510
115	11.700		2.700	4.500	7.500	11.700
115	11.800		2.700	4.500	7.500	11.800
115	11.910	15/32	2.700	4.500	7.500	11.910
120	12.000		2.900	5.000	7.700	12.000
120	12.100		2.900	5.000	7.700	12.100
120	12.200		2.900	5.000	7.700	12.200
120	12.300	31/64	2.900	5.000	7.700	12.300
125	12.500		3.000	5.000	7.700	12.500
125	12.600		3.000	5.000	7.700	12.600
125	12.700	1/2	3.000	5.000	7.700	12.700
125	12.800		3.000	5.000	7.700	12.800
125	12.900		3.000	5.000	7.700	12.900
130	13.000		3.100	5.500	8.500	13.000
130	13.100	33/64	3.100	5.500	8.500	13.100
130	13.490	17/32	3.100	5.500	8.500	13.490
135	13.500		3.300	5.500	8.500	13.500
135	13.600		3.300	5.500	8.500	13.600
135	13.700		3.300	5.500	8.500	13.700
135	13.800		3.300	5.500	8.500	13.800
135	13.890	35/64	3.300	5.500	8.500	13.890
140	14.000		3.400	6.000	9.600	14.000
140	14.100		3.400	6.000	9.600	14.100
140	14.290	9/16	3.400	6.000	9.600	14.290
140	14.400		3.400	6.000	9.600	14.400
145	14.500		3.500	6.000	9.600	14.500
145	14.600		3.500	6.000	9.600	14.600
145	14.680	37/64	3.500	6.000	9.600	14.680
145	14.700		3.500	6.000	9.600	14.700
145	14.800		3.500	6.000	9.600	14.800
150	15.000		3.600	6.000	9.800	15.000
150	15.080	19/32	3.600	6.000	9.800	15.080
150	15.100		3.600	6.000	9.800	15.100
150	15.200		3.600	6.000	9.800	15.200
150	15.300		3.600	6.000	9.800	15.300
150	15.480	39/64	3.600	6.000	9.800	15.480
155	15.500		3.800	6.000	9.800	15.500
155	15.600		3.800	6.000	9.800	15.600
155	15.700		3.800	6.000	9.800	15.700



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
155	15.800		3.800	6.000	9.800	15.800
155	15.870	5/8	3.800	6.000	9.800	15.870
160	16.000		3.800	7.000	11.000	16.000
160	16.270	41/64	3.800	7.000	11.000	16.270
165	16.500		4.000	7.000	11.000	16.500
165	16.670	21/32	4.000	7.000	11.000	16.670
170	17.000		4.100	7.000	11.000	17.000
170	17.070	43/64	4.100	7.000	11.000	17.070
170	17.460	11/16	4.100	7.000	11.000	17.460
175	17.500		4.200	7.000	11.000	17.500
175	17.600		4.200	7.000	11.000	17.600
175	17.860	45/64	4.200	7.000	11.000	17.860
180	18.000		4.300	8.000	12.600	18.000
180	18.260	23/32	4.300	8.000	12.600	18.260
185	18.500		4.400	8.000	12.600	18.500
185	18.650	47/64	4.400	8.000	12.600	18.650
190	19.000		4.600	8.000	12.600	19.000
190	19.050	3/4	4.600	8.000	12.600	19.050
190	19.250		4.600	8.000	12.600	19.250
190	19.450	49/64	4.600	8.000	12.600	19.450
195	19.500		4.700	8.000	12.600	19.500
195	19.600		4.700	8.000	12.600	19.600
195	19.840	25/32	4.700	8.000	12.600	19.840
200	20.000		4.800	9.000	13.900	20.000
200	20.240	51/64	4.800	9.000	13.900	20.240
205	20.500		5.000	9.000	13.900	20.500
205	20.640	13/16	5.000	9.000	13.900	20.640
210	21.000		5.100	9.000	13.900	21.000
210	21.030	53/64	5.100	9.000	13.900	21.030
210	21.100		5.100	9.000	13.900	21.100
210	21.430	27/32	5.100	9.000	13.900	21.430
215	21.500		5.200	9.000	13.900	21.500
215	21.830	55/64	5.200	9.000	13.900	21.830
220	22.000		5.300	10.000	15.300	22.000
220	22.220	7/8	5.300	10.000	15.300	22.220
225	22.500		5.400	10.000	15.300	22.500
225	22.620	57/64	5.400	10.000	15.300	22.620
230	23.000		5.600	10.000	15.300	23.000
230	23.020	29/32	5.600	10.000	15.300	23.020
230	23.420	59/64	5.600	10.000	15.300	23.420
235	23.500		5.700	10.000	15.300	23.500
235	23.810	15/16	5.700	10.000	15.300	23.810
240	24.000		5.800	11.000	15.800	24.000
240	24.100		5.800	11.000	15.800	24.100
240	24.210	61/64	5.800	11.000	15.800	24.210
245	24.500		6.000	11.000	15.800	24.500
245	24.610	31/32	6.000	11.000	15.800	24.610
250	25.000	63/64	6.100	11.000	15.800	25.000
250	25.400	1	6.100	11.000	15.800	25.400
255	25.500		6.200	11.000	15.800	25.500
255	25.670		6.200	11.000	15.800	25.670
255	25.700		6.200	11.000	15.800	25.700
255	25.810		6.200	11.000	15.800	25.810
260	26.000		6.000	12.000	20.000	26.000
260	26.190	1 1/32	6.000	12.000	20.000	26.190
265	26.500		6.100	12.000	20.000	26.500
265	26.590	1 3/64	6.100	12.000	20.000	26.590
270	27.000		6.300	12.000	20.000	27.000
275	27.500		6.400	12.000	20.000	27.500
275	27.700		6.400	12.000	20.000	27.700
275	27.780	1 3/32	6.400	12.000	20.000	27.780
280	28.000		6.600	13.000	20.700	28.000
280	28.180	1 7/64	6.600	13.000	20.700	28.180
285	28.500		6.700	13.000	20.700	28.500
285	28.580		6.700	13.000	20.700	28.580
290	29.000		6.900	13.000	20.700	29.000
290	29.370	1 5/32	6.900	13.000	20.700	29.370
295	29.500		7.000	13.000	20.700	29.500
295	29.770	1 11/64	7.000	13.000	20.700	29.770
300	30.000		6.900	14.000	22.300	30.000
300	30.160	1 3/16	6.900	14.000	22.300	30.160
305	30.500		7.000	14.000	22.300	30.500



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
305	30.960	1 7/32	7.000	14.000	22.300	30.960
310	31.000		7.200	14.000	22.300	31.000
315	31.500		7.300	14.000	22.300	31.500
315	31.750	1 1/4	7.300	14.000	22.300	31.750
320	32.000		7.500	15.000	23.100	32.000
320	32.500		7.600	15.000	23.100	32.500
320	32.540	1 9/32	7.600	15.000	23.100	32.540
320	32.940	1 19/64	7.600	15.000	23.100	32.940
330	33.000		7.800	15.000	23.100	33.000
330	33.340	1 5/16	7.800	15.000	23.100	33.340
330	33.500		7.900	15.000	23.100	33.500
340	34.000		8.100	15.000	23.100	34.000
340	34.130	1 11/32	8.100	15.000	23.100	34.130
340	34.500		8.200	15.000	23.100	34.500
340	34.930		8.200	15.000	23.100	34.930
350	35.000		8.300	15.000	23.100	35.000
350	35.500		8.400	15.000	23.100	35.500
350	35.720	1 13/32	8.400	15.000	23.100	35.720
360	36.000		8.500	16.000	23.900	36.000
360	36.500		8.600	16.000	23.900	36.500
360	36.510	1 7/16	8.600	16.000	23.900	36.510
370	37.000		8.800	16.000	23.900	37.000
370	37.310	1 15/32	8.800	16.000	23.900	37.310
370	37.500		8.900	16.000	23.900	37.500
380	38.000		9.000	16.000	23.900	38.000
380	38.100	1 1/2	9.000	16.000	23.900	38.100
380	38.500	1 33/64	9.100	16.000	23.900	38.500
390	39.000		9.300	16.000	23.900	39.000
390	39.500		9.400	16.000	23.900	39.500
400	40.000		9.400	16.000	23.900	40.000



APPLICATION EXAMPLE CAST HOUSING

Tool type	Multiplex HPC
Article no. insert	86723
Article no. holder	86684
Diameter	22 mm
Drilling depth	110 mm
Material	EN-GJL-250
Cooling	IK 60 bar
Lubricant	Soluble oil
Machine	Machining centre
v_c	90 m/min
f	0.5 mm/rev.
Tool life	350 m



Multiplex HPC interchangeable inserts

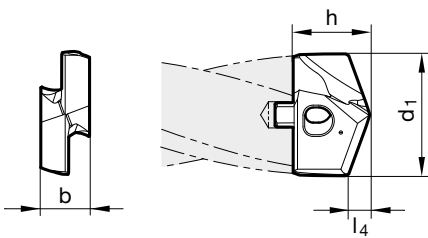
Article no. 86724



P	M	K	N	S	H
			•		



web thinning $\geq \varnothing 11.000$ • relieved cone • clamping screws art. no. 86843 included • main cutting edge form concave aluminium and Al alloys • non-ferrous metals



Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
110	11.000		2.100	4.500	7.500	11.000
110	11.200		2.100	4.500	7.500	11.200
115	11.500		2.100	4.500	7.500	11.500
115	11.510	29/64	2.100	4.500	7.500	11.510
115	11.700		2.200	4.500	7.500	11.700
115	11.800		2.200	4.500	7.500	11.800
115	11.910	15/32	2.200	4.500	7.500	11.910
120	12.000		2.200	5.000	7.700	12.000
120	12.100		2.300	5.000	7.700	12.100
120	12.200		2.300	5.000	7.700	12.200
120	12.300	31/64	2.300	5.000	7.700	12.300
125	12.500		2.300	5.000	7.700	12.500
125	12.600		2.300	5.000	7.700	12.600
125	12.700	1/2	2.400	5.000	7.700	12.700
125	12.800		2.400	5.000	7.700	12.800
125	12.900		2.400	5.000	7.700	12.900
130	13.000		2.400	5.500	8.500	13.000
130	13.100	33/64	2.400	5.500	8.500	13.100
130	13.490	17/32	2.500	5.500	8.500	13.490
135	13.500		2.500	5.500	8.500	13.500
135	13.600		2.500	5.500	8.500	13.600
135	13.700		2.500	5.500	8.500	13.700
135	13.800		2.600	5.500	8.500	13.800
135	13.890	35/64	2.600	5.500	8.500	13.890
140	14.000		2.600	6.000	9.600	14.000
140	14.100		2.600	6.000	9.600	14.100
140	14.290	9/16	2.700	6.000	9.600	14.290
140	14.400		2.700	6.000	9.600	14.400
145	14.500		2.700	6.000	9.600	14.500
145	14.600		2.700	6.000	9.600	14.600
145	14.680	37/64	2.700	6.000	9.600	14.680
145	14.700		2.700	6.000	9.600	14.700
145	14.800		2.700	6.000	9.600	14.800
150	15.000		2.800	6.000	9.800	15.000
150	15.080	19/32	2.800	6.000	9.800	15.080
150	15.100		2.800	6.000	9.800	15.100
150	15.200		2.800	6.000	9.800	15.200
150	15.300		2.800	6.000	9.800	15.300
150	15.480	39/64	2.900	6.000	9.800	15.480
155	15.500		2.900	6.000	9.800	15.500
155	15.600		2.900	6.000	9.800	15.600
155	15.700		2.900	6.000	9.800	15.700



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
155	15.800		2.900	6.000	9.800	15.800
155	15.870	5/8	2.900	6.000	9.800	15.870
160	16.000		3.000	7.000	11.000	16.000
160	16.270	41/64	3.000	7.000	11.000	16.270
165	16.500		3.100	7.000	11.000	16.500
165	16.670	21/32	3.100	7.000	11.000	16.670
170	17.000		3.100	7.000	11.000	17.000
170	17.070	43/64	3.200	7.000	11.000	17.070
170	17.460	11/16	3.200	7.000	11.000	17.460
175	17.500		3.200	7.000	11.000	17.500
175	17.600		3.300	7.000	11.000	17.600
175	17.860	45/64	3.300	7.000	11.000	17.860
180	18.000		3.300	8.000	12.600	18.000
180	18.260	23/32	3.400	8.000	12.600	18.260
185	18.500		3.400	8.000	12.600	18.500
185	18.650	47/64	3.400	8.000	12.600	18.650
190	19.000		3.500	8.000	12.600	19.000
190	19.050	3/4	3.500	8.000	12.600	19.050
190	19.250		3.600	8.000	12.600	19.250
190	19.450	49/64	3.600	8.000	12.600	19.450
195	19.500		3.600	8.000	12.600	19.500
195	19.600		3.600	8.000	12.600	19.600
195	19.840	25/32	3.700	8.000	12.600	19.840
200	20.000		3.700	9.000	13.900	20.000
200	20.240	51/64	3.700	9.000	13.900	20.240
205	20.500		3.800	9.000	13.900	20.500
205	20.640	13/16	3.800	9.000	13.900	20.640
210	21.000		3.900	9.000	13.900	21.000
210	21.030	53/64	3.900	9.000	13.900	21.030
210	21.100		3.900	9.000	13.900	21.100
210	21.430	27/32	3.900	9.000	13.900	21.430
215	21.500		4.000	9.000	13.900	21.500
215	21.830	55/64	4.000	9.000	13.900	21.830
220	22.000		4.100	10.000	15.300	22.000
220	22.220	7/8	4.100	10.000	15.300	22.220
225	22.500		4.100	10.000	15.300	22.500
225	22.620	57/64	4.200	10.000	15.300	22.620
230	23.000		4.200	10.000	15.300	23.000
230	23.020	29/32	4.200	10.000	15.300	23.020
230	23.420	59/64	4.300	10.000	15.300	23.420
235	23.500		4.300	10.000	15.300	23.500
235	23.810	15/16	4.400	10.000	15.300	23.810
240	24.000		4.400	11.000	15.800	24.000
240	24.100		4.400	11.000	15.800	24.100
240	24.210	61/64	4.500	11.000	15.800	24.210
245	24.500		4.500	11.000	15.800	24.500
245	24.610	31/32	4.500	11.000	15.800	24.610
250	25.000	63/64	4.600	11.000	15.800	25.000
250	25.400	1	4.700	11.000	15.800	25.400
255	25.500		4.700	11.000	15.800	25.500
255	25.670		4.700	11.000	15.800	25.670
255	25.700		4.700	11.000	15.800	25.700
255	25.810		4.700	11.000	15.800	25.810
260	26.000		4.800	12.000	20.000	26.000
260	26.190	1 1/32	4.800	12.000	20.000	26.190
265	26.500		4.900	12.000	20.000	26.500
265	26.590	1 3/64	4.900	12.000	20.000	26.590
270	27.000		5.000	12.000	20.000	27.000
275	27.500		5.100	12.000	20.000	27.500
275	27.700		5.100	12.000	20.000	27.700
275	27.780	1 3/32	5.100	12.000	20.000	27.780
280	28.000		5.100	13.000	20.700	28.000
280	28.180	1 7/64	5.200	13.000	20.700	28.180
285	28.500		5.200	13.000	20.700	28.500
285	28.580		5.300	13.000	20.700	28.580
290	29.000		5.300	13.000	20.700	29.000
290	29.370	1 5/32	5.400	13.000	20.700	29.370
295	29.500		5.400	13.000	20.700	29.500
295	29.770	1 11/64	5.500	13.000	20.700	29.770
300	30.000		5.500	14.000	22.300	30.000
300	30.160	1 3/16	5.500	14.000	22.300	30.160
305	30.500		5.600	14.000	22.300	30.500



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
305	30.960	1 7/32	5.700	14.000	22.300	30.960
310	31.000		5.700	14.000	22.300	31.000
315	31.500		5.800	14.000	22.300	31.500
315	31.750	1 1/4	5.800	14.000	22.300	31.750
320	32.000		5.900	15.000	23.100	32.000
320	32.500		6.000	15.000	23.100	32.500
320	32.540	1 9/32	6.000	15.000	23.100	32.540
320	32.940	1 19/64	6.000	15.000	23.100	32.940
330	33.000		6.100	15.000	23.100	33.000
330	33.340	1 5/16	6.100	15.000	23.100	33.340
330	33.500		6.100	15.000	23.100	33.500
340	34.000		6.200	15.000	23.100	34.000
340	34.130	1 11/32	6.300	15.000	23.100	34.130
340	34.500		6.300	15.000	23.100	34.500
340	34.930		6.400	15.000	23.100	34.930
350	35.000		6.400	15.000	23.100	35.000
350	35.500		6.500	15.000	23.100	35.500
350	35.720	1 13/32	6.600	15.000	23.100	35.720
360	36.000		6.600	16.000	23.900	36.000
360	36.500		6.700	16.000	23.900	36.500
360	36.510	1 7/16	6.700	16.000	23.900	36.510
370	37.000		6.800	16.000	23.900	37.000
370	37.310	1 15/32	6.800	16.000	23.900	37.310
370	37.500		6.900	16.000	23.900	37.500
380	38.000		7.000	16.000	23.900	38.000
380	38.100	1 1/2	7.000	16.000	23.900	38.100
380	38.500	1 33/64	7.100	16.000	23.900	38.500
390	39.000		7.100	16.000	23.900	39.000
390	39.500		7.200	16.000	23.900	39.500
400	40.000		7.300	16.000	23.900	40.000



APPLICATION EXAMPLE ALUMINIUM WHEEL RIM

Tool type	Multiplex HPC
Article no. insert	86724
Article no. holder	86685
Diameter	13 mm
Drilling depth	90 mm
Material	G-ALSi7
Cooling	IK 40 bar
Lubricant	Soluble oil
Machine	Machining centre
v_c	140 m/min
f	0.25 mm/rev.
Tool life	300 m



Multiplex HPC interchangeable inserts

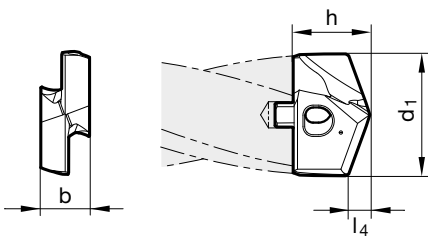
Article no. 86721



P	M	K	N	S	H
○	○	○	○	○	○



web thinning $\geq \varnothing 11.000$ • facet point grind • main cutting edge form straight (after correction) • clamping screws art. no. 86843 included
 Piloting in all materials



Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
110	11.000		1.800	4.500	7.200	11.000
110	11.200		1.800	4.500	7.200	11.200
110	11.500		1.900	4.500	7.200	11.500
110	11.510	29/64	1.900	4.500	7.200	11.510
110	11.700		1.900	4.500	7.200	11.700
110	11.800		1.900	4.500	7.200	11.800
110	11.910	15/32	1.900	4.500	7.200	11.910
120	12.000		1.900	5.000	7.400	12.000
120	12.100		2.000	5.000	7.400	12.100
120	12.200		2.000	5.000	7.400	12.200
120	12.300	31/64	2.000	5.000	7.400	12.300
120	12.500		2.000	5.000	7.400	12.500
120	12.600		2.000	5.000	7.400	12.600
120	12.700	1/2	2.100	5.000	7.400	12.700
120	12.800		2.100	5.000	7.400	12.800
120	12.900		2.100	5.000	7.400	12.900
130	13.000		2.100	5.500	8.200	13.000
130	13.100	33/64	2.100	5.500	8.200	13.100
130	13.490	17/32	2.200	5.500	8.200	13.490
130	13.500		2.200	5.500	8.200	13.500
130	13.600		2.200	5.500	8.200	13.600
130	13.700		2.200	5.500	8.200	13.700
130	13.800		2.200	5.500	8.200	13.800
130	13.890	35/64	2.200	5.500	8.200	13.890
140	14.000		2.300	6.000	9.400	14.000
140	14.100		2.300	6.000	9.400	14.100
140	14.290	9/16	2.300	6.000	9.400	14.290
140	14.400		2.300	6.000	9.400	14.400
140	14.500		2.300	6.000	9.400	14.500
140	14.600		2.400	6.000	9.400	14.600
140	14.680	37/64	2.400	6.000	9.400	14.680
140	14.700		2.400	6.000	9.400	14.700
140	14.800		2.400	6.000	9.400	14.800
140	15.000		2.400	6.000	9.400	15.000
140	15.080	19/32	2.400	6.000	9.400	15.080
140	15.100		2.400	6.000	9.400	15.100
140	15.200		2.400	6.000	9.400	15.200
140	15.300		2.500	6.000	9.400	15.300
140	15.480	39/64	2.500	6.000	9.400	15.480
140	15.500		2.500	6.000	9.400	15.500
140	15.600		2.500	6.000	9.400	15.600
140	15.700		2.500	6.000	9.400	15.700



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
140	15.800		2.500	6.000	9.400	15.800
140	15.870	5/8	2.600	6.000	9.400	15.870
160	16.000		2.600	7.000	10.600	16.000
160	16.270	41/64	2.600	7.000	10.600	16.270
160	16.500		2.700	7.000	10.600	16.500
160	16.670	21/32	2.700	7.000	10.600	16.670
160	17.000		2.700	7.000	10.600	17.000
160	17.070	43/64	2.700	7.000	10.600	17.070
160	17.460	11/16	2.800	7.000	10.600	17.460
160	17.500		2.800	7.000	10.600	17.500
160	17.600		2.800	7.000	10.600	17.600
160	17.860	45/64	2.900	7.000	10.600	17.860
180	18.000		2.900	8.000	12.100	18.000
180	18.260	23/32	2.900	8.000	12.100	18.260
180	18.500		3.000	8.000	12.100	18.500
180	18.650	47/64	3.000	8.000	12.100	18.650
180	19.000		3.000	8.000	12.100	19.000
180	19.050	3/4	3.100	8.000	12.100	19.050
180	19.450	49/64	3.100	8.000	12.100	19.450
180	19.500		3.100	8.000	12.100	19.500
180	19.600		3.100	8.000	12.100	19.600
180	19.840	25/32	3.200	8.000	12.100	19.840
200	20.000		3.200	9.000	13.300	20.000
200	20.240	51/64	3.200	9.000	13.300	20.240
200	20.500		3.300	9.000	13.300	20.500
200	20.640	13/16	3.300	9.000	13.300	20.640
200	21.000		3.400	9.000	13.300	21.000
200	21.030	53/64	3.400	9.000	13.300	21.030
200	21.100		3.400	9.000	13.300	21.100
200	21.430	27/32	3.400	9.000	13.300	21.430
200	21.500		3.400	9.000	13.300	21.500
200	21.830	55/64	3.500	9.000	13.300	21.830
220	22.000		3.500	10.000	14.800	22.000
220	22.220	7/8	3.600	10.000	14.800	22.220
220	22.500		3.600	10.000	14.800	22.500
220	22.620	57/64	3.600	10.000	14.800	22.620
220	23.000		3.700	10.000	14.800	23.000
220	23.020	29/32	3.700	10.000	14.800	23.020
220	23.420	59/64	3.700	10.000	14.800	23.420
220	23.500		3.800	10.000	14.800	23.500
220	23.810	15/16	3.800	10.000	14.800	23.810
240	24.000		3.800	11.000	15.300	24.000
240	24.100		3.800	11.000	15.300	24.100
240	24.210	61/64	3.900	11.000	15.300	24.210
240	24.500		3.900	11.000	15.300	24.500
240	24.610	31/32	3.900	11.000	15.300	24.610
240	25.000	63/64	4.000	11.000	15.300	25.000
240	25.400	1	4.100	11.000	15.300	25.400
240	25.500		4.100	11.000	15.300	25.500
240	25.700		4.100	11.000	15.300	25.700
260	26.000		4.100	12.000	19.400	26.000
260	26.190	1 1/32	4.200	12.000	19.400	26.190
260	26.500		4.200	12.000	19.400	26.500
260	26.590	1 3/64	4.200	12.000	19.400	26.590
260	27.000		4.300	12.000	19.400	27.000
260	27.500		4.400	12.000	19.400	27.500
260	27.700		4.400	12.000	19.400	27.700
260	27.780	1 3/32	4.400	12.000	19.400	27.780
280	28.000		4.500	13.000	20.100	28.000
280	28.180	1 7/64	4.500	13.000	20.100	28.180
280	28.500		4.500	13.000	20.100	28.500
280	28.580		4.600	13.000	20.100	28.580
280	29.000		4.600	13.000	20.100	29.000
280	29.370	1 5/32	4.700	13.000	20.100	29.370
280	29.500		4.700	13.000	20.100	29.500
300	30.000		4.800	14.000	21.700	30.000
300	30.160	1 3/16	4.800	14.000	21.700	30.160
300	30.500		4.900	14.000	21.700	30.500
300	30.960	1 7/32	4.900	14.000	21.700	30.960
300	31.000		4.900	14.000	21.700	31.000
300	31.500		5.000	14.000	21.700	31.500
300	31.750	1 1/4	5.100	14.000	21.700	31.750



Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
320	32.000		5.100	15.000	22.400	32.000
320	32.500		5.200	15.000	22.400	32.500
320	32.540	1 9/32	5.200	15.000	22.400	32.540
320	33.000		5.300	15.000	22.400	33.000
320	33.340	1 5/16	5.300	15.000	22.400	33.340
320	33.500		5.300	15.000	22.400	33.500
320	34.000		5.400	15.000	22.400	34.000
320	34.130	1 11/32	5.400	15.000	22.400	34.130
320	34.500		5.500	15.000	22.400	34.500
320	34.930		5.600	15.000	22.400	34.930
320	35.000		5.600	15.000	22.400	35.000
320	35.500		5.600	15.000	22.400	35.500
320	35.720	1 13/32	5.700	15.000	22.400	35.720
360	36.000		5.700	16.000	23.200	36.000
360	36.500		5.800	16.000	23.200	36.500
360	36.510	1 7/16	5.800	16.000	23.200	36.510
360	37.000		5.900	16.000	23.200	37.000
360	37.310	1 15/32	5.900	16.000	23.200	37.310
360	37.500		6.000	16.000	23.200	37.500
360	38.000		6.000	16.000	23.200	38.000
360	38.100	1 1/2	6.100	16.000	23.200	38.100
360	38.500	1 33/64	6.100	16.000	23.200	38.500
360	39.000		6.200	16.000	23.200	39.000
360	39.500		6.300	16.000	23.200	39.500
360	40.000		6.400	16.000	23.200	40.000

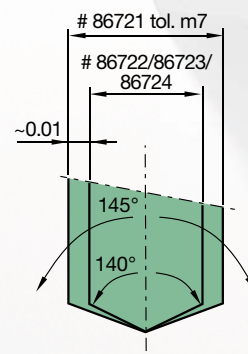


PILOT INSERT ARTICLE NO. 86721

Special point thinning for exact centering

Double margin guarantees precise bore holes

A 145° point angle and the m7 diameter tolerance arrange for perfect conditions for the following cutting insert





Multiplex HPC interchangeable inserts

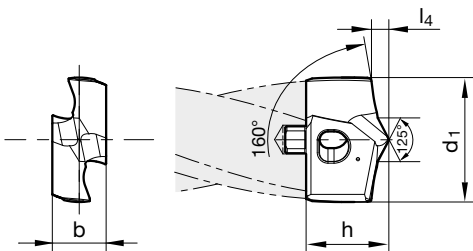
Article no. 86729



P	M	K	N	S	H
•					



facet point grind • main cutting edge form concave • special point geometry with 160° point angle and 125° centre point • clamping screws art. no. 86843 included



Size	d1 mm	inch	l4 mm	b mm	h mm	Code no.
120	12.000		1.700	5.000	7.500	12.000
140	14.000		2.000	6.000	9.500	14.000
160	16.000		2.300	7.000	10.800	16.000
180	18.000		2.600	8.000	12.300	18.000
200	20.000		2.900	9.000	13.600	20.000
210	21.000		3.000	9.000	13.600	21.000
220	22.000		3.200	10.000	14.900	22.000
240	24.000		3.500	11.000	15.500	24.000
250	25.000	63/64	3.600	11.000	15.500	25.000
260	26.000		3.800	12.000	18.500	26.000
270	27.000		3.900	12.000	18.600	27.000
280	28.000		4.100	13.000	18.600	28.000
290	29.000		4.200	13.000	18.600	29.000
300	30.000		4.400	14.000	19.900	30.000
320	32.000		4.600	15.000	21.300	32.000
330	33.000		4.800	15.000	21.700	33.000
340	34.000		4.900	15.000	22.200	34.000
360	36.000		5.200	16.000	22.500	36.000
380	38.000		5.500	16.000	23.000	38.000
400	40.000		5.800	16.000	23.100	40.000

MULTIPLIX HPC INTERCHANGEABLE INSERT FOR THE MACHINING OF STEEL BEAMS



The point geometry of the new interchangeable insert ensures optimal centering characteristics and therefore compensates unstable machining conditions in the machining of steel beams.

- ▼ new interchangeable inserts especially for the machining of steel beams
- ▼ reduced burr formation
- ▼ optimal centering characteristics
- ▼ smooth drilling performance
- ▼ particularly suitable for the use on drilling-sawing and drilling-burning lines

Minimised burr formation thanks to reduced point angle in outer area.



Multiplex HPC countersink inserts

Article no. 86728



P	M	K	N	S	H
•	○	○		○	○



alloyed/unalloyed steel and cast steel

ISO	Holder size	Code no.
CPGT050202F R-P	110-140	52.020
CPGT050204F R-P	110-140	52.040
CPGT060202F R-P	160-280	62.020
CPGT060204F R-P	160-280	62.040
CPGT09T308F R-P	300-360	93.080



Multiplex HPC countersink inserts

Article no. 86726



P	M	K	N	S	H
○		●			

VHM



grey cast iron, malleable and spheroidal iron

ISO	Holder size	Code no.
CPGW050202F N-K	110-140	52.020
CPGW050204F N-K	110-140	52.040
CPGW060202F N-K	160-280	62.020
CPGW060204F N-K	160-280	62.040
CPGW09T308F N-K	300-360	93.080



Multiplex HPC countersink inserts

Article no. 86727



P	M	K	N	S	H
			•		



aluminium and Al alloys • non-ferrous metals

ISO		Holder size	Code no.
CPGT050202F	R-AL	110-140	52.020
CPGT050204F	R-AL	110-140	52.040
CPGT060202F	R-AL	160-280	62.020
CPGT060204F	R-AL	160-280	62.040
CPGT09T308F	R-AL	300-360	93.080

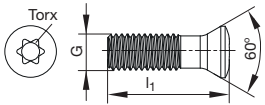


Clamping screws for countersink holders

Article no. 86846



tightening torques for screws see "Multiplex HPC - technology and advantages"



G	l1 mm	Torx	Code no.
M 2,0X5,50	5.500	T6	2.000
M 2,0X5,30	5.300	T7	2.500
M 4 X9,50	9.500	T15	4.006

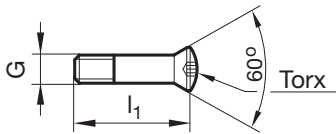


Clamping screws for HPC Multiplex holders 1.5-10xD

Article no. 86843



tightening torques for screws see "Multiplex HPC - technology and advantages"



G	l1 mm	Torx	Code no.
M 2.2	9.500	T7	2.200
M 2.2	10.500	T7	2.201
M 2.5	11.400	T8	2.500
M 3	12.100	T9	3.000
M 3	13.100	T9	3.001
M 3.5	14.250	T10	3.500
M 4	16.000	T15	4.000
M 4.5	18.000	T15	4.500
M5	19.750	T20	5.000
M5	21.750	T20	5.001
M5	23.400	T20	5.003
M6	27.000	T25	6.000
M6	28.500	T25	6.001
M6	32.500	T25	6.002



HARTNER

Torque wrenches

Article no. 86844



Drive		Torque Nm	L mm	Type	Code no.
1/4"	hexagonal	0,8-2	160.000	A	2.000
1/4"	hexagonal	2-8	200.000	A	8.000
1/4"	T-handle	5-14	200.000	E	14.000



Torx bits

Article no. 86845



Drive		Torx	L mm	Code no.
1/4	hexagonal	T7	25.000	7.000
1/4	hexagonal	T8	25.000	8.000
1/4	hexagonal	T9	25.000	9.000
1/4	hexagonal	T10	25.000	10.000
1/4	hexagonal	T15	25.000	15.000
1/4	hexagonal	T20	25.000	20.000
1/4	hexagonal	T25	25.000	25.001



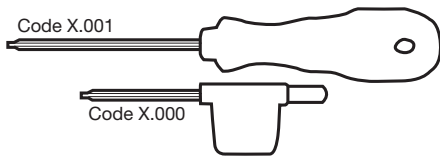
HARTNER

Torx screwdriver

Article no. 86842



screwdriver for Torx screws



Torx	Code no.
T6	6.000
T6	6.001
T7	7.000
T7	7.001
T8	8.001
T9	9.001
T10	10.001
T15	15.000
T20	20.001
T25	25.001

TECHNICAL SECTION



THE COATINGS



○ Bright coating

- ▼ Especially for the machining of wrought and cast aluminium alloys with a high silicon content, un-coated drills offer a very good machining performance. In order to counter adhesive (formation of built-up edges), these tools are optimally suited to this field of application thanks to a special geometry combined with a high surface quality in the point thinning, flute and clearance areas.



Ⓡ FIRE-/nanoFIRE coating

- ▼ Coating colour: black-violet
- ▼ Multi-layer TiAlN coating with gradient structure. All-round coating offering at least two times the performance of TiN. Combines the benefits of TiN, TiAlN and TiCN. Excellent heat-proof thermal insulation. High toughness.



Ⓡ AlTiNnano coating

- ▼ Coating colour: black-violet
- ▼ The well established coating has been developed at Hartner. By optimizing the structural, chemical and mechanical properties of the new AlTiN coating an extremely high hot hardness, very good oxidation resistance and excellent coating adhesion have been achieved. This coating is used exclusively on carbide cutting tools and is ideally suited for difficult-to-machine aerospace materials such as titanium alloys, Inconel as well as machining hardened steel materials (> 52 HRC) and HSC applications. Particularly suitable for the machining of stainless steels. Also perfectly suitable for the machining of stainless steels.



Y TiAlSiN coating

- ▼ Coating colour: bronze
- ▼ This multilayer, ultra hard and heat-resistant coating is especially designated for the machining of high-tensile steels as well as hardened steels and cast iron. Thanks to its nanocomposite structure with a layer made up of TiAlN and SiN, it achieves the extreme hardness of 5500 HV.



T TiN coating

- ▼ Coating colour: golden
- ▼ Proven and cost-effective all-rounder coating with a hardness of 2200 HV. Very good results with the machining of general steels.



A TiAlN coating

- ▼ Coating colour: black-violet
- ▼ Special coating for machining tasks in abrasive materials (cast iron, AISi) and/or high temperatures, such as when it is not possible to cool the tool or the tool can only be cooled to a limited extent such as when drilling deep boreholes or boreholes with small diameters. It is important to note in these cases in particular that the coating only results in significant performance improvements for higher cutting parameters.

MULTIPLEX HPC – TECHNOLOGY AND ADVANTAGES

WHEN USING THE MULTIPLEX HPC SYSTEM KINDLY TAKE ACCOUNT OF THE FOLLOWING ADVICE AND RECOMMENDATIONS:

We recommend when changing the insert to also replace the clamping screw! Therefore, every holder is supplied with a clamping screw, article no. 86843, and screwdriver, article no. 86842.

Every interchangeable insert is also supplied with a clamping screw, article no. 86843. When changing the insert please observe the following tightening torques for the clamping screw. Adhering to them is absolutely necessary for optimal machining results!

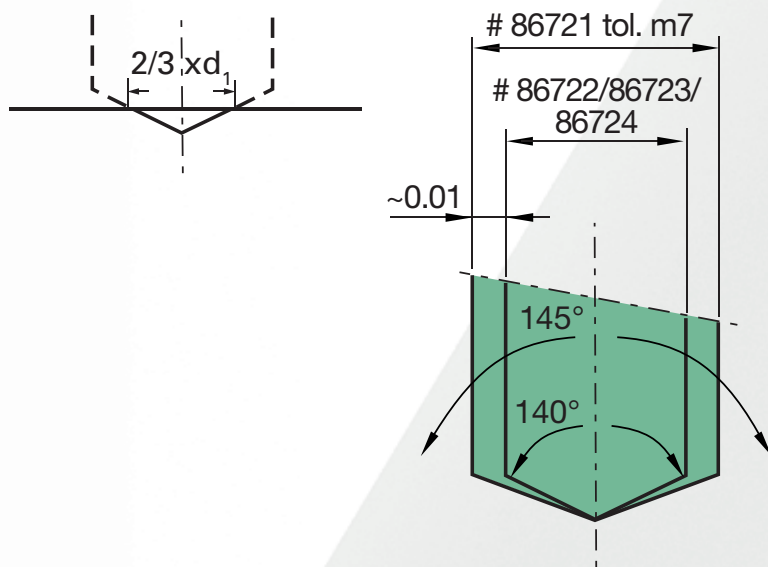
Diameter range	11.0 - 12.99	13.0 - 13.99	14.0 - 15.99	16.0 - 17.99	18.0 - 19.99	20.0 - 21.99	22.0 - 29.99	30.0 - 40.00
Thread	M2.2	M2.5	M3	M3.5	M4	M4.5	M5	M6
Torx size	T7	T8	T9	T10	T15	T15	T20	T25
Tightening torque [Nm]	0.8	1.0	1.7	2.7	4.0	6.0	8.0	14.0

Indications valid for thread lock „Loctite“!

- ▼ For through holes supporting lands must remain in permanent contact. We recommend to additionally reduce the feed rate before the insert exits the bore hole.
- ▼ In contrast to conventional indexable inserts, Multiplex HPC tools are also suitable for the drilling of stacked sheets.
- ▼ On a lathe (stationary tool) it must be ensured that the tool is accurately centred.
- ▼ Pre-condition for optimal machining results is a sufficient cooling lubricant supply with soluble or neat oil.

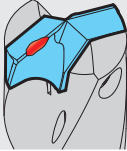
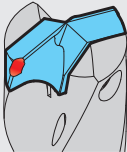
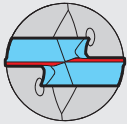
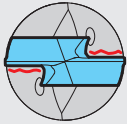
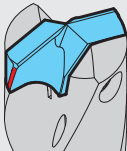
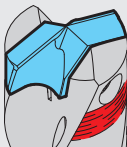
PILOT DRILLING / COUNTERSINKING

- ▼ For drilling depths from $5 \times D$ we generally recommend centring or pilot drilling with holder article no. 86681, and pilot insert, article no. 86721. Alternatively – depending on the material to be machined – TS-Drills type TS 100 U or TS 100 INOX can be applied.
- ▼ For drilling without centring we recommend reducing the feed rate at the start of the hole.



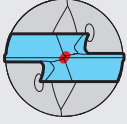
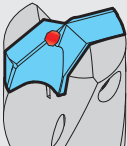
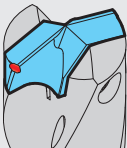
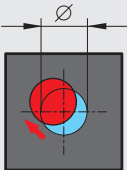
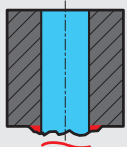
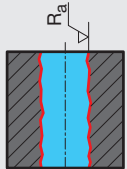


Troubleshooting

Problem	Cause	Remedy
1 Cutting edge build up 	<ul style="list-style-type: none"> ■ low cutting speed ■ excessive honing of cutting lip ■ bright finish cutting lip 	<ul style="list-style-type: none"> ■ increase cutting speed ■ reduce cutting lip honing ■ have tool coated
2 Crumbling of outer corners 	<ul style="list-style-type: none"> ■ non rigid conditions, insufficient workpiece clamping ■ deviation from concentricity too large ■ interrupted cut 	<ul style="list-style-type: none"> ■ rigid clamping of workpiece ■ check and correct concentricity if possible ■ reduce feed
3 Heavy wear at flank 	<ul style="list-style-type: none"> ■ cutting speed too high ■ feed too low ■ clearance angle too small 	<ul style="list-style-type: none"> ■ reduce cutting speed ■ increase feed ■ increase clearance angle
4 Crumbling on cutting lips 	<ul style="list-style-type: none"> ■ non rigid conditions, insufficient workpiece clamping ■ interrupted cut ■ max. wear values exceeded ■ incorrect tool type 	<ul style="list-style-type: none"> ■ rigid clamping of workpiece ■ reduce feed ■ reduce tool change intervals ■ apply suitable tool (see selection guide)
5 Land wear 	<ul style="list-style-type: none"> ■ non rigid conditions, insufficient workpiece clamping ■ deviation from concentricity too large ■ back taper too small ■ incorrect coolant (oil), coolant too weak 	<ul style="list-style-type: none"> ■ rigid clamping of workpiece ■ check and correct concentricity if possible ■ increase back taper ■ increase strength of coolant or use neat oil
6 Scoring on tool body 	<ul style="list-style-type: none"> ■ non rigid conditions, insufficient workpiece clamping ■ deviation from concentricity too large ■ interrupted cut ■ abrasive workpiece material 	<ul style="list-style-type: none"> ■ rigid clamping of workpiece ■ check and correct concentricity if possible ■ reduce feed ■ increase strength of coolant or use neat oil



Troubleshooting

Problem	Cause	Remedy
7 Heavy chisel edge wear 	<ul style="list-style-type: none"> ■ cutting speed too low ■ feed too high ■ excessive honing of cutting lip 	<ul style="list-style-type: none"> ■ increase cutting speed ■ reduce feed ■ reduce cutting lip honing
8 Crumbling at intersection, web thinning and cutting lip 	<ul style="list-style-type: none"> ■ clearance angle too small ■ excessive honing of cutting lip ■ incorrect tool type 	<ul style="list-style-type: none"> ■ increase clearance angle ■ reduce cutting lip honing ■ apply suitable tool (see selection guide)
9 Plastic deformation of outer corner 	<ul style="list-style-type: none"> ■ cutting speed too high ■ insufficient coolant volume ■ incorrect or no honing at corner 	<ul style="list-style-type: none"> ■ reduce cutting speed ■ increase volume/pressure ■ correct honing
10 Misalignment 	<ul style="list-style-type: none"> ■ non rigid conditions, insufficient workpiece clamping ■ deviation from concentricity too large ■ spotting area transverse ■ chisel edge too large 	<ul style="list-style-type: none"> ■ rigid clamping of workpiece ■ check and correct concentricity if possible ■ use milling cutter (2-fluted) for spotting ■ reduce chisel edge
11 Heavy burring on breakthrough 	<ul style="list-style-type: none"> ■ feed too high ■ max. wear values exceeded ■ excessive honing of cutting lip 	<ul style="list-style-type: none"> ■ reduce feed ■ reduce tool change intervals ■ reduce cutting lip honing
12 Unsatisfactory surface quality 	<ul style="list-style-type: none"> ■ non rigid conditions, insufficient workpiece clamping ■ deviation from concentricity too large ■ insufficient coolant volume 	<ul style="list-style-type: none"> ■ rigid clamping of workpiece ■ check and correct concentricity if possible ■ increase volume/pressure



Application recommendations for Multiplex HPC

Article no.
Standard/DIN
Tool material
used with holder
Drilling depth
Surface
Application
Std. range page

Drill Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

Coolant:
 ○ Air
 ● Oil
 ● Soluble oil

All data are approximate values. The actually achievable cutting speeds and feed rates depend on the respective machining conditions. We recommend suitable drilling trials.

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm ²)	Hardness	Coolant
Common structural steels	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
Unalloyed case hardened steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Alloyed case hardened steels	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	-		≤48 HRC ≤66 HRC	●
Stainless steels, sulphured austenitic martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.86681 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
Cast iron	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
Spheroidal graphite iron and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
Chilled cast iron	-		≤350 HB	○
New cast materials CGI	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
New cast materials ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Aluminium and Al alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al cast alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
≤ 24 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
long-chipping	2.0790 CuNi18Zn19Pb	≤850		○
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○



HARTNER

≤1xD/≤1.5xD

86722
WN
VHM
86681/86682
1.5xD
Steel
20

86725
WN
VHM
86681/86682
1.5xD
stainless steels
24

86723
WN
VHM
86681/86682
1.5xD
Cast iron
28

86724
WN
VHM
86681/86682
1.5xD
Al/Al alloys
32

86721
WN
VHM
86681/86682
1xD/1.5xD
Pilot drill./countersink.
36

86729
WN
VHM
86681/86682
1.5xD
for steel beams
40



v _c m/min	VR-Code	v _c m/min	VR-Code	v _c m/min	VR-Code	v _c m/min	VR-Code	v _c m/min	VR-Code	v _c m/min	VR-Code
130	6							130	6	100	5
110	5							110	5	80	5
130	7							130	7		
110	6							110	6		
130	6							130	6		
125	6							125	6		
110	5							110	5		
110	6							110	6		
90	5							90	5		
130	7							130	7		
110	6							110	6		
70	4							70	4		
105	5							105	5		
70	4							70	4		
60	5							60	5		
55	4							55	4		
55	3							55	3		
50	2							50	2		
		25	2					25	2		
		55	3					55	3		
		40	3					40	3		
		35	3					35	3		
				100	6			100	6		
				90	6			90	6		
				120	7			120	7		
				100	6			100	6		
		90	6					90	6		
				80	5			80	5		
				80	5			80	5		
				80	5			80	5		
				80	5			80	5		
		25	2					25	2		
		40	3					40	3		
		35	2					35	2		
						200	7	200	7		
						180	7	180	7		
						150	7	150	7		
						120	7	120	7		
						180	7	180	7		
						70	6	70	6		
						180	7	180	7		
						120	6	120	6		
						70	6	70	6		
						50	6	50	6		
						45	6	45	6		
						35	5	35	5		



Application recommendations for Multiplex HPC

Article no.
Standard/DIN
Tool material
used with holder
Drilling depth
Surface
Application
Std. range page

Drill Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

Coolant:
 ○ Air
 ● Oil
 ● Soluble oil

All data are approximate values. The actually achievable cutting speeds and feed rates depend on the respective machining conditions. We recommend suitable drilling trials.

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm ²)	Hardness	Coolant
Common structural steels	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
Unalloyed case hardened steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Alloyed case hardened steels	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	-		≤48 HRC ≤66 HRC	●
Stainless steels, sulphured austenitic martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.86681 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
Cast iron	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
Spheroidal graphite iron and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
Chilled cast iron	-		≤350 HB	○
New cast materials CGI	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
New cast materials ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Aluminium and Al alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al cast alloys ≤ 10 % Si ≤ 24 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤600		○
Brass, short-chipping long-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		○
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○



HARTNER

≤3xD

86722
WN
VHM
86683
3xD
F
Steel
20

86725
WN
VHM
86683
3xD
a
stainless steels
24

86723
WN
VHM
86683
3xD
Y
Cast iron
28

86724
WN
VHM
86683
3xD
○
Al/Al alloys
32

86729
WN
VHM
86683
3xD
F
for steel beams
40



v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code
130	6							90	5
110	5							75	5
130	7								
110	6								
130	6								
125	6								
110	5								
110	6								
90	5								
130	7								
110	6								
70	4								
105	5								
70	4								
60	5								
55	4								
55	3								
50	2								
		25	2						
		55	3						
		40	3						
		35	3						
				100	6				
				90	6				
				120	7				
				100	6				
		90	6						
				80	5				
				80	5				
				80	5				
				80	5				
		25	2						
		40	3						
		35	2						
								200	7
								180	7
								150	7
								120	7
								180	7
								70	6
								180	7
								120	6
								70	6
								50	6
								45	6
								35	5



Application recommendations for Multiplex HPC

Article no.
Standard/DIN
Tool material
used with holder
Drilling depth
Surface
Application
Std. range page

Drill Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

Coolant:
 ○ Air
 ● Oil
 ● Soluble oil

All data are approximate values. The actually achievable cutting speeds and feed rates depend on the respective machining conditions. We recommend suitable drilling trials.

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm ²)	Hardness	Coolant
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Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
Unalloyed case hardened steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Alloyed case hardened steels	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	-		≤48 HRC ≤66 HRC	●
Stainless steels, sulphured austenitic martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.86681 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
Cast iron	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
Spheroidal graphite iron and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
Chilled cast iron	-		≤350 HB	○
New cast materials CGI	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
New cast materials ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Aluminium and Al alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al cast alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
≤ 24 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤600		○
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
long-chipping	2.0790 CuNi18Zn19Pb	≤850		○
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○



Application recommendations for Multiplex HPC

Article no.
Standard/DIN
Tool material
used with holder
Drilling depth
Surface
Application
Std. range page

Drill Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

Coolant:
 ○ Air
 ● Oil
 ● Soluble oil

All data are approximate values. The actually achievable cutting speeds and feed rates depend on the respective machining conditions. We recommend suitable drilling trials.

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm ²)	Hardness	Coolant
Common structural steels	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
Unalloyed case hardened steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Alloyed case hardened steels	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	-		≤48 HRC ≤66 HRC	●
Stainless steels, sulphured austenitic martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.86681 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
Cast iron	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
Spheroidal graphite iron and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
Chilled cast iron	-		≤350 HB	○
New cast materials CGI	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
New cast materials ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Aluminium and Al alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al cast alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Brass, short-chipping long-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		○
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○



Application recommendations for Multiplex HPC

Article no.
Standard/DIN
Tool material
used with holder
Drilling depth
Surface
Application
Std. range page

Drill Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

Coolant:
 ○ Air
 ● Oil
 ● Soluble oil

All data are approximate values. The actually achievable cutting speeds and feed rates depend on the respective machining conditions. We recommend suitable drilling trials.

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm ²)	Hardness	Coolant
Common structural steels	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Unalloyed case hardened steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Alloyed case hardened steels	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Nitriding steels	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		●
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	-		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.86681 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
austenitic	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Cast iron	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Spheroidal graphite iron and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMw-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Chilled cast iron	-		≤350 HB	○
New cast materials CGI	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
New cast materials ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
Aluminium and Al alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Al cast alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
≤ 24 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

THE HARTNER PROGRAMME



▼ FU 500 / FN 500



▼ GUN DRILLS



▼ INOX DRILLS



▼ MICRO-PRECISION DRILLS



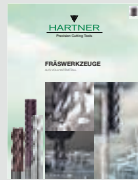
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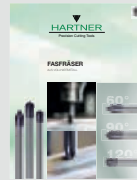
▼ TS-DRILLS



▼ TF 100 MULTI-MILL



▼ SOLID CARBIDE
MILLING CUTTERS



▼ CHAMFERING
MILLING CUTTERS



▼ MULTIPLEX



▼ MULTIPLEX HPC

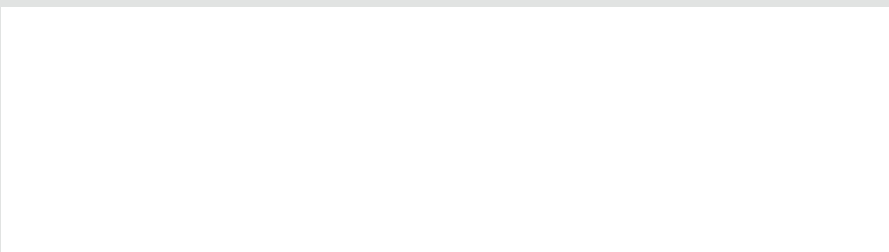


▼ TM VENDING MACHINES

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