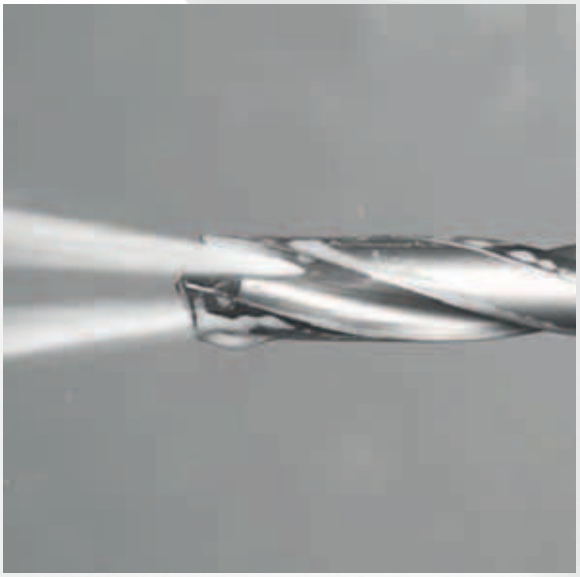
EN

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) · a (AlTiN nano) · F (FIRE) · A (TiAlN) · Y (TiAlSiN) · Ni (nickel-plated) · T (TiN)
Type	HPC
Drilling depth	1xD · 1,5xD · 3xD · 5xD · 7xD · 10xD
Tolerance on Ø	h7 · m7
Standard	WN
	to Hartner Standard
Point angle	140° · 145° · 160° 125°
Cutting direction	R (right) · N (neutral)
Shank form	HE
	to DIN 6535
Web thinning	
Internal coolant	
	with IC

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

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

optimal chip evacuation
- special flute cross-section
- ultra-smooth surface finish

perfect cooling lubrication
- coolant ducts with maximum cross section
- exit from the flute

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

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

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

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

Multiplex HPC holders

	Company std.	HPC		Ni	right-hand	with	1.5xD	11.000 - 39.005	**86682**	9

	Company std.	HPC		Ni	right-hand	with	3xD	11.000 - 39.005	**86683**	11

	Company std.	HPC		Ni	right-hand	with	5xD	11.000 - 39.000	**86684**	13

	Company std.	HPC		Ni	right-hand	with	7xD	11.000 - 31.505	**86685**	15

	Company std.	HPC		Ni	right-hand	with	10xD	11.000 - 31.505	**86686**	17

	Company std.	HPC		Ni	right-hand	with	1xD	11.000 - 36.005	**86681**	19

Multiplex HPC interchangeable inserts

●	○	○				Company std.	HPC	**Solid carbide**	F	right-hand			11.000 - 40.000	**86722**	20

○	●			○	○	Company std.	HPC	**Solid carbide**	a	right-hand			11.000 - 40.000	**86725**	24

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

Multiplex HPC interchangeable inserts

○		●				Company std.	HPC	**Solid carbide**	Y	right-hand			11.000 - 40.000	**86723**	28

			●			Company std.	HPC	**Solid carbide**	◯	right-hand			11.000 - 40.000	**86724**	32

○	○	○	○	○	○	Company std.	HPC	**Solid carbide**	a	right-hand			11.000 - 40.000	**86721**	36

●						Company std.		**Solid carbide**	F	right-hand			12.000 - 40.000	**86729**	40

Multiplex HPC countersink inserts

●	○	○		○	○	Company std.		**Solid carbide**	T	right-hand			52.020 - 93.080	**86728**	42

○		●				Company std.		**Solid carbide**	A	left and right			52.020 - 93.080	**86726**	43

			●			Company std.		**Solid carbide**	◯	right-hand			52.020 - 93.080	**86727**	44

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

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

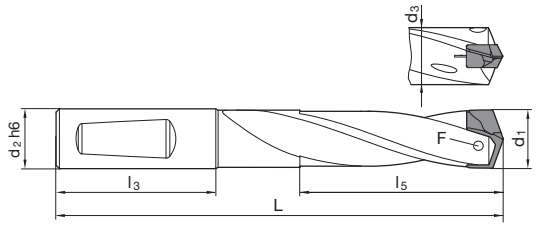
HARTNER

Multiplex HPC holders

Article no. 86682

Ni | HPC | 1,5xD | WN | R | HE

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	l3 mm	l5 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**

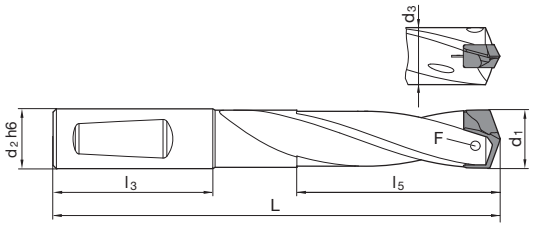
HARTNER

Multiplex HPC holders

Article no. 86683

Ni HPC 3xD WN R HE

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	l3 mm	l5 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**

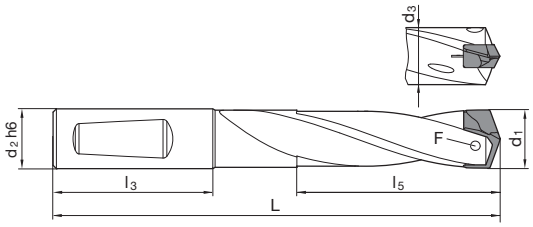
HARTNER

Multiplex HPC holders

Article no. 86684

Ni HPC 5xD WN R HE

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**

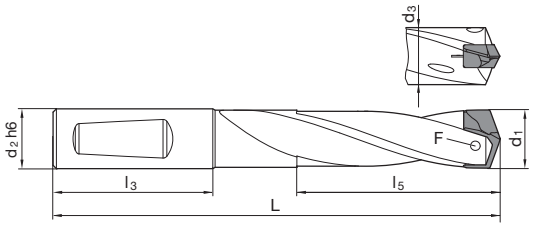
HARTNER

Multiplex HPC holders

Article no. 86685

Ni HPC 7xD WN R HE

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**

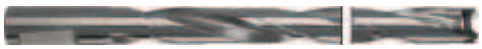
Multiplex HPC holders

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**

HARTNER

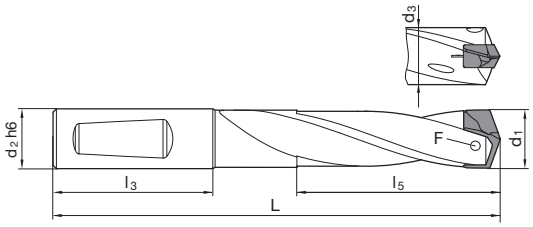
Multiplex HPC holders

Article no. 86686



Ni | HPC | 10xD | WN | R | HE

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

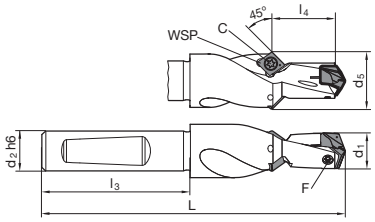
Size mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	Code no.
215	21.50-21.99	25.000	21.200	317.000	56.000	224.200	86843 4.500	**21.500**
215	21.50-21.99	25.400	21.200	317.000	56.000	224.200	86843 4.500	**21.505**
220	22.00-22.49	25.000	21.700	323.000	56.000	229.300	86843 5.000	**22.000**
220	22.00-22.49	25.400	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**

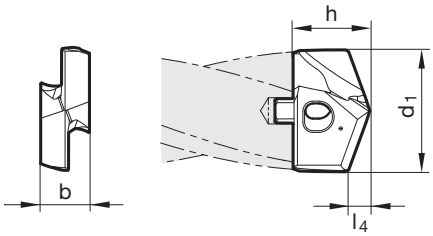
Multiplex HPC interchangeable inserts

Article no. 86722

P	M	K	N	S	H
●	○	○			

VHM | F | HPC | WN | 140° | h7 | R

web thinning ≥ Ø 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**

HARTNER

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

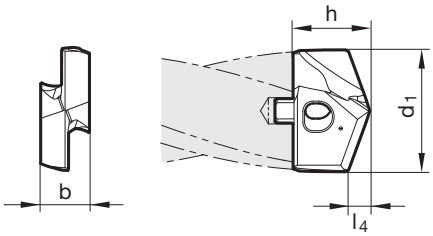
Multiplex HPC interchangeable inserts

Article no. 86725

P	M	K	N	S	H
○	●			○	○

VHM | a | HPC | WN | 140° | h7 | R

web thinning ≥ Ø 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	l4 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**

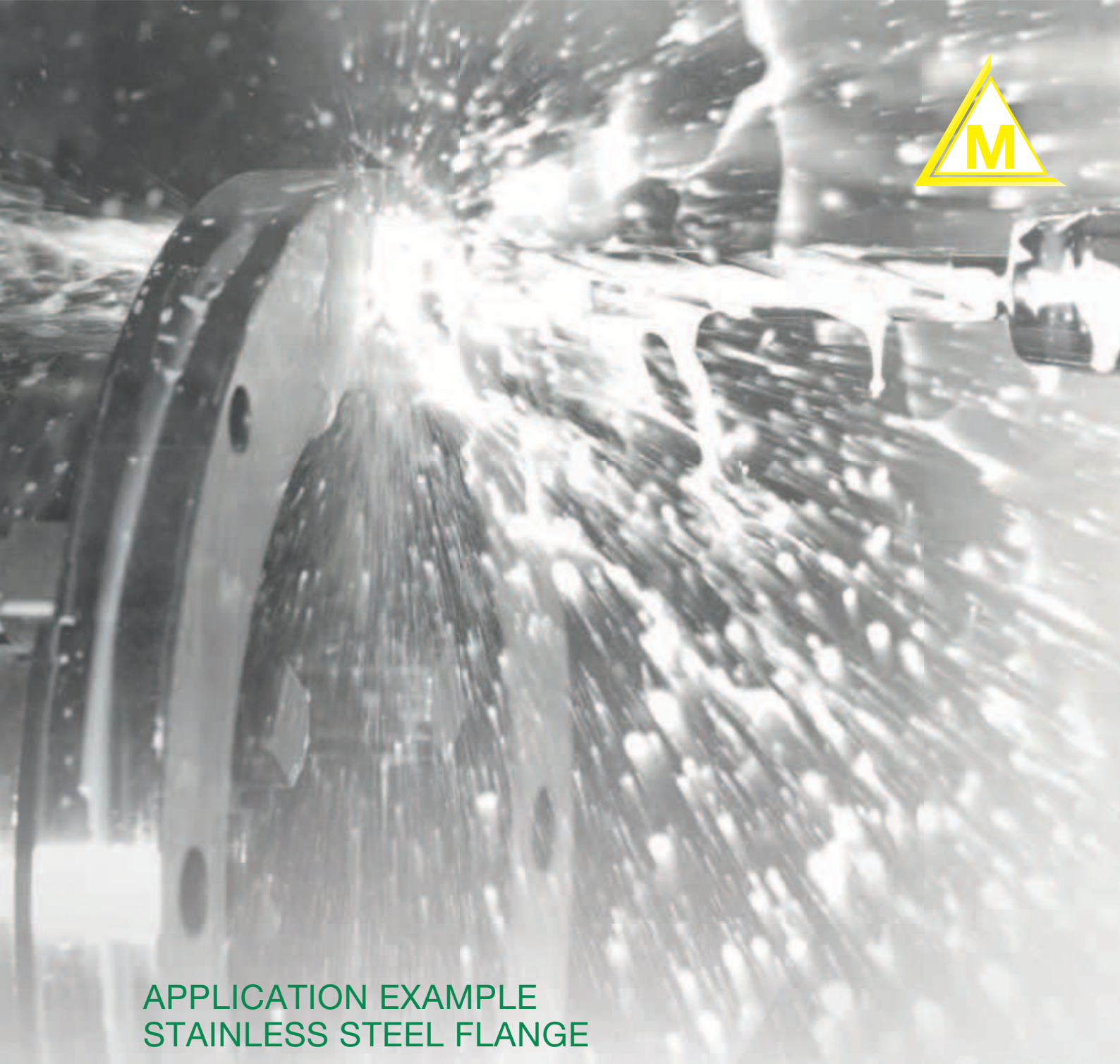
HARTNER

Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	l4 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	l4 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

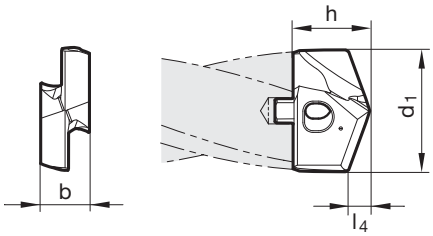
Multiplex HPC interchangeable inserts

Article no. 86723

P	M	K	N	S	H
○		•			

VHM | HPC | WN | 140° | m7 | R

web thinning ≥ Ø 11.000 • facet point grind • main cutting edge form straight (after correction) • clamping screws art. no. 86843 included
vermicular cast iron GGV • grey cast iron, malleable and spheroidal iron



Size	d1 mm	inch	l4 mm	b mm	l4 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**

HARTNER

Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	l4 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	l4 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

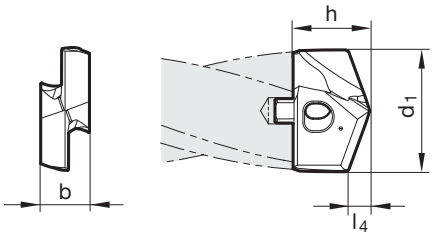
Multiplex HPC interchangeable inserts

Article no. 86724

P	M	K	N	S	H
			•		

VHM | ○ | HPC | WN | 140° | h7 | R | 

web thinning ≥ Ø 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	l4 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**

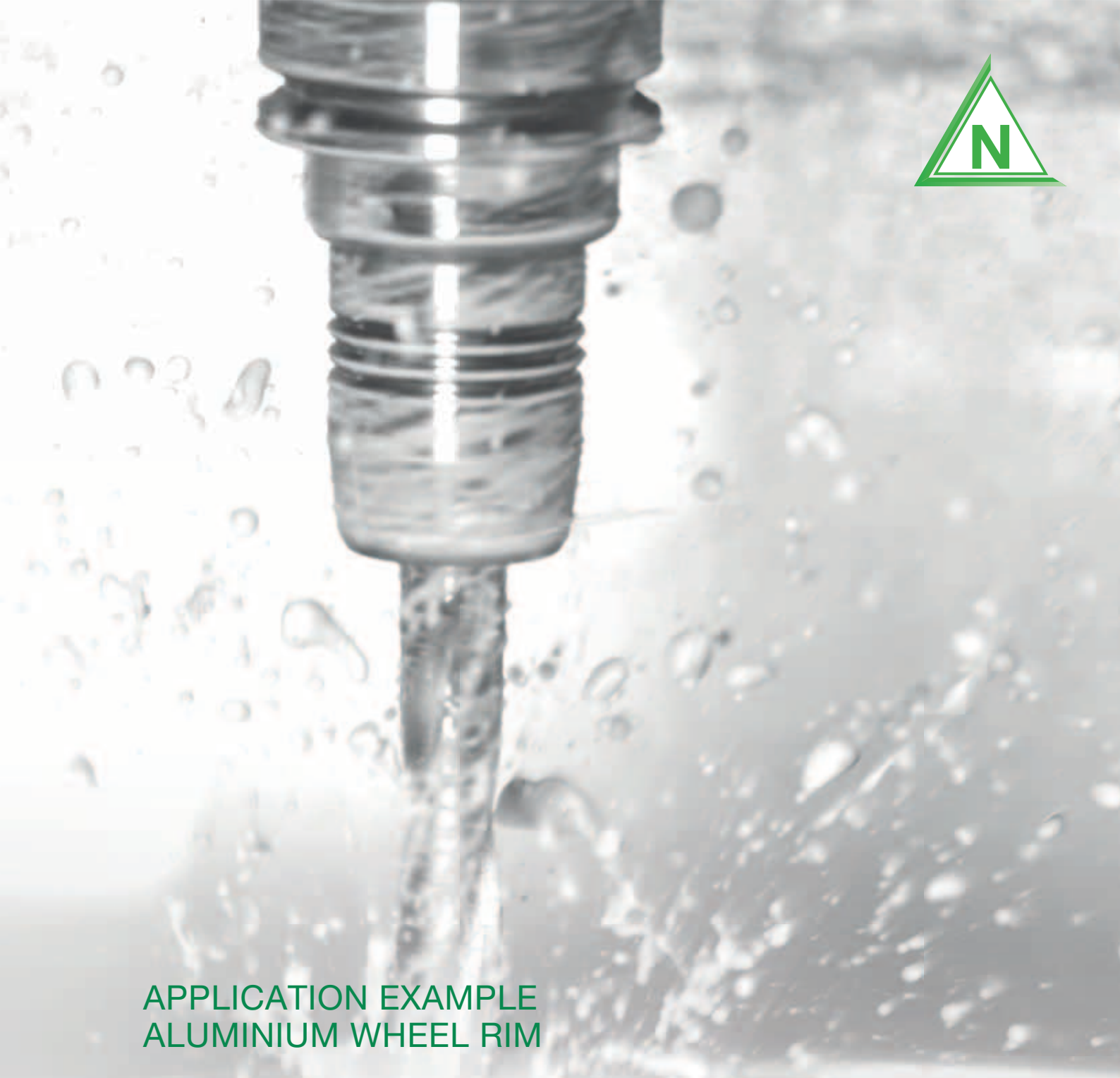
HARTNER

Multiplex HPC interchangeable inserts

Size	d1 mm	inch	l4 mm	b mm	l4 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	l4 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

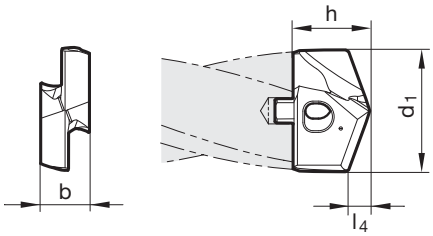
Multiplex HPC interchangeable inserts

Article no. 86721

P	M	K	N	S	H
○	○	○	○	○	○

VHM | a | HPC | WN | 145° | m7 | R

web thinning ≥ Ø 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	l4 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	l4 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

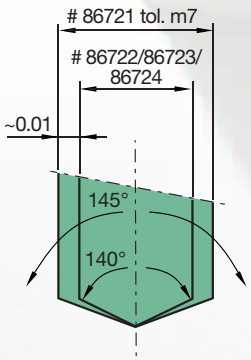
Size	d1 mm	 inch	l4 mm	b mm	l4 mm	Code no.
320	32.000		5.100	15.000	22.400	**32.000**
320	32.500		5.200	15.000	22.400	**32.500**
320	32.540	1 9/32	5.200	15.000	22.400	**32.540**
320	33.000		5.300	15.000	22.400	**33.000**
320	33.340	1 5/16	5.300	15.000	22.400	**33.340**
320	33.500		5.300	15.000	22.400	**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



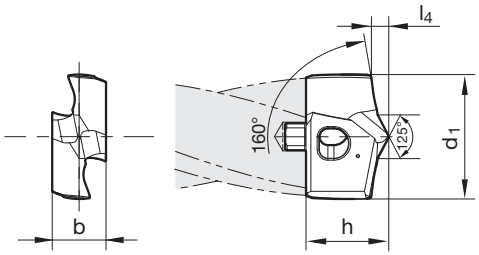
Multiplex HPC interchangeable inserts

Article no. 86729

P	M	K	N	S	H
•					

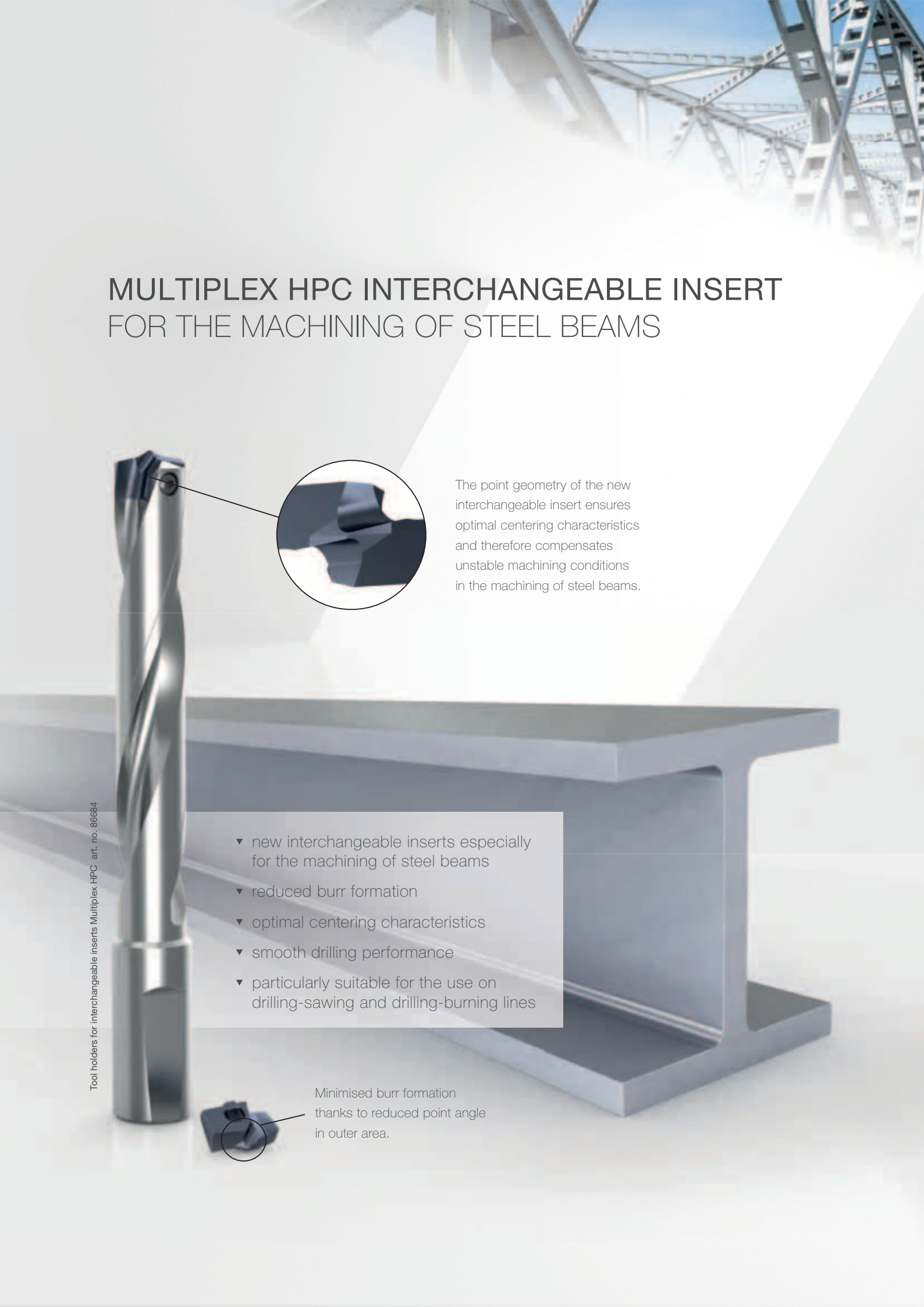
VHM | F | WN | 160° 125° | h7 | R

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	l4 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**

MULTIPLEX 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.

Tool holders for interchangeable inserts Multiplex HPC art. no. 86684

Multiplex HPC countersink inserts

Article no. 86728

P	M	K	N	S	H
●	○	○		○	○

VHM | T | WN | R

alloyed/unalloyed steel and cast steel

ISO	Holder size	Code no.
CPGT050202FR-P	110-140	**52.020**
CPGT050204FR-P	110-140	**52.040**
CPGT060202FR-P	160-180	**62.020**
CPGT060204FR-P	160-180	**62.040**
CPGT09T308FR-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.
CPGW050202FN-K	110-140	**52.020**
CPGW050204FN-K	110-140	**52.040**
CPGW060202FN-K	160-180	**62.020**
CPGW060204FN-K	160-180	**62.040**
CPGW09T308FN-K	300-360	**93.080**

Multiplex HPC countersink inserts

Article no. 86727

P	M	K	N	S	H
			•		

VHM | ○ | WN | R

aluminium and Al-alloys • non-ferrous metals

ISO	Holder size	Code no.
CPGT050202FR-AL	110-140	**52.020**
CPGT050204FR-AL	110-140	**52.040**
CPGT060202FR-AL	160-180	**62.020**
CPGT060204FR-AL	160-180	**62.040**
CPGT09T308FR-AL	300-360	**93.080**

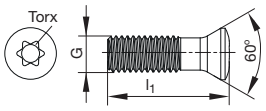
HARTNER

Clamping screws for countersink holders

Article no. 86846

WN

tightening torques for screws see “Multiplex HPC - technology and advantages”



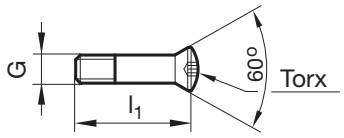
G	l1 mm	Torx	**Code no.**
M 2,0X5,50	5.500	T6	**2.000**
M 2,0X5,30	5.300	T7	**2.500**
M 4 X9,50	9.500	T15	**4.006**

Clamping screws for HPC Multiplex holders 1.5-10xD

Article no. 86843

WN

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**

Torque wrenches

Article no. 86844

WN

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

WN

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**

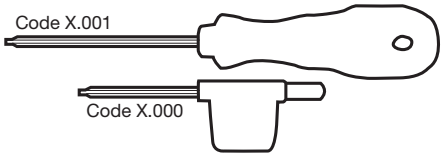
HARTNER

Torx screwdriver

Article no. 86842

WN

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, AlSi) 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!

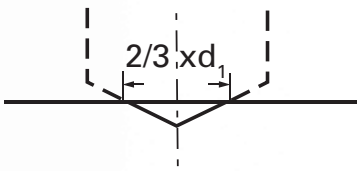
Diameter range	11.0 - 12.99	13.0 - 13.99	14.0 - 15.99	16.0 - 17.99	18.0 - 19.99	20.0 - 21.99	22.0 - 29.99	30.0 - 40.00
Thread	M2.2	M2.5	M3	M3.5	M4	M4.5	M5	M6
Torx size	T7	T8	T9	T10	T15	T15	T20	T25
Tightening torque [Nm]	0.8	1.0	1.7	2.7	4.0	6.0	8.0	14.0

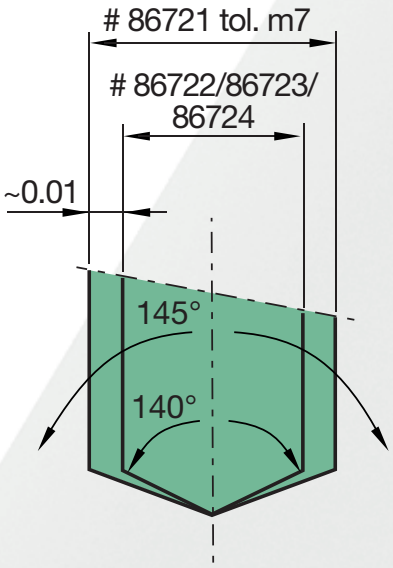
Indications valid for thread lock „Loctite“!

- 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.

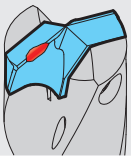
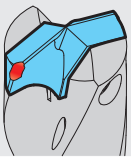
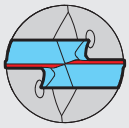
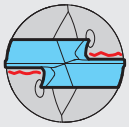
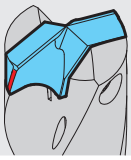
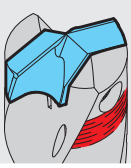
PILOT DRILLING / COUNTERSINKING

- For drilling depths from 5xD 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.

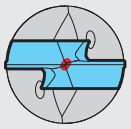
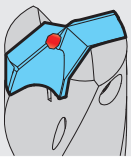
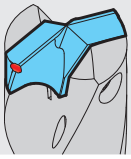
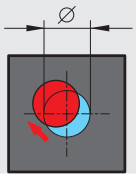
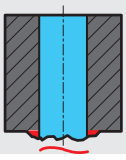
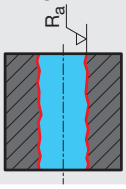




Troubleshooting

	Problem	Cause	Remedy
1	**Cutting edge build up** 	low cutting speed	increase cutting speed
		excessive honing of cutting lip	reduce cutting lip honing
		bright finish cutting lip	have tool coated
2	**Crumbling of outer corners** 	non rigid conditions, insufficient workpiece clamping	rigid clamping of workpiece
		deviation from concentricity too large	check and correct concentricity if possible
		interrupted cut	reduce feed
3	**Heavy wear at flank** 	cutting speed too high	reduce cutting speed
		feed too low	increase feed
		clearance angle too small	increase clearance angle
4	**Crumbling on cutting lips** 	non rigid conditions, insufficient workpiece clamping	rigid clamping of workpiece
		interrupted cut	reduce feed
		max. wear values exceeded	reduce tool change intervals
		incorrect tool type	apply suitable tool (see selection guide)
5	**Land wear** 	non rigid conditions, insufficient workpiece clamping	rigid clamping of workpiece
		deviation from concentricity too large	check and correct concentricity if possible
		back taper too small	increase back taper
		incorrect coolant (oil), coolant too weak	increase strength of coolant or use neat oil
6	**Scoring on tool body** 	non rigid conditions, insufficient workpiece clamping	rigid clamping of workpiece
		deviation from concentricity too large	check and correct concentricity if possible
		interrupted cut	reduce feed
		abrasive workpiece material	increase strength of coolant or use neat oil

Troubleshooting

	Problem	Cause	Remedy
7	**Heavy chisel edge wear** 	cutting speed too low	increase cutting speed
		feed too high	reduce feed
		excessive honing of cutting lip	reduce cutting lip honing
8	**Crumbling at intersection, web thinning and cutting lip** 	clearance angle too small	increase clearance angle
		excessive honing of cutting lip	reduce cutting lip honing
		incorrect tool type	apply suitable tool (see selection guide)
9	**Plastic deformation of outer corner** 	cutting speed too high	reduce cutting speed
		insufficient coolant volume	increase volume/pressure
		incorrect or no honing at corner	correct honing
10	**Misalignment** 	non rigid conditions, insufficient workpiece clamping	rigid clamping of workpiece
		deviation from concentricity too large	check and correct concentricity if possible
		spotting area transverse	use milling cutter (2-fluted) for spotting
		chisel edge too large	reduce chisel edge
11	**Heavy burring on breakthrough** 	feed too high	reduce feed
		max. wear values exceeded	reduce tool change intervals
		excessive honing of cutting lip	reduce cutting lip honing
12	**Unsatisfactory surface quality** 	non rigid conditions, insufficient workpiece clamping	rigid clamping of workpiece
		deviation from concentricity too large	check and correct concentricity if possible
		insufficient coolant volume	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/mm²)	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	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
malleable cast iron	**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		○

≤1×D / ≤1.5×D

86722	86725	86723	86724	86721	86729
WN	WN	WN	WN	WN	WN
VHM	VHM	VHM	VHM	VHM	VHM
86681/86682	86681/86682	86681/86682	86681/86682	86681/86682	86681/86682
1.5xD	1.5xD	1.5xD	1.5xD	1xD/1.5xD	1.5xD
F	a	Y	○	a	F
Steel	stainless steels	Cast iron	Al/Al alloys	Pilot drill./countersink.	for steel beams
20	24	28	32	36	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/mm²)	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	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
malleable cast iron	**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		○

≤3×D

86722	86725	86723	86724	86729
WN	WN	WN	WN	WN
VHM	VHM	VHM	VHM	VHM
86683	86683	86683	86683	86683
3xD	3xD	3xD	3xD	3xD
F	a	Y	○	F
Steel	stainless steels	Cast iron	Al/Al alloys	for steel beams
20	24	28	32	40





v_c m/min	VR-Code
130	6
110	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

v_c m/min	VR-Code
25	2
55	3
40	3
35	3
90	6
25	2
40	3
35	2

v_c m/min	VR-Code
100	6
90	6
120	7
100	6
80	5
80	5
80	5
80	5

v_c m/min	VR-Code
200	7
180	7
150	7
120	7
180	7
70	6
180	7
120	6
70	6
50	6
45	6
35	5

v_c m/min	VR-Code
90	5
75	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/mm²)	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	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
malleable cast iron	**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		○

≤5×D

86722	86725	86723	86724	86729
WN	WN	WN	WN	WN
VHM	VHM	VHM	VHM	VHM
86684	86684	86684	86684	86684
5xD	5xD	5xD	5xD	5xD
F	a	Y	○	F
Steel	stainless steels	Cast iron	Al/Al alloys	for steel beams
20	24	28	32	40





v_c m/min	VR-Code
125	6
105	5
125	7
105	6
125	6
120	6
105	5
105	6
85	5
125	7
105	6
70	4
105	5
70	4
55	5
50	4
55	3
50	2

v_c m/min	VR-Code
25	2
55	3
40	3
35	3
90	6
25	2
40	3
35	2

v_c m/min	VR-Code
100	6
90	6
120	7
100	6
80	5
80	5
80	5
80	5

v_c m/min	VR-Code
180	7
180	7
140	7
110	7
180	7
70	6
180	7
120	6
70	6
50	6
45	6
35	5

v_c m/min	VR-Code
90	5
75	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/mm²)	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		○

≤7×D

86722	86725	86723	86724	86729
WN	WN	WN	WN	WN
VHM	VHM	VHM	VHM	VHM
86685	86685	86685	86685	86685
7xD	7xD	7xD	7xD	7xD
F	a	Y	◯	F
Steel	stainless steels	Cast iron	Al/Al alloys	for steel beams
20	24	28	32	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
120	5							*90*	5
105	4							*75*	5
120	6								
105	5								
120	5								
110	5								
100	4								
100	5								
85	4								
120	6								
100	5								
70	4								
105	4								
70	3								
55	4								
50	3								
55	2								
50	2								
		25	1						
		55	2						
		40	2						
		35	2						
				80	6				
				70	6				
				100	7				
				80	6				
		70	6						
				60	5				
				60	5				
				60	5				
				60	5				
		25	1						
		40	2						
		35	1						
						180	6		
						180	6		
						140	6		
						110	6		
						180	6		
						70	5		
						180	6		
						120	5		
						70	5		
						50	5		
						45	5		
						35	4		

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/mm²)	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	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
malleable cast iron	**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		○

≤10×D

86722	86725	86723	86724	86729
WN	WN	WN	WN	WN
VHM	VHM	VHM	VHM	VHM
86686	86686	86686	86686	86686
10xD	10xD	10xD	10xD	10xD
F	a	Y	○	F
Steel	stainless steels	Cast iron	Al/Al alloys	for steel beams
20	24	28	32	40





v_c m/min	VR-Code
100	5
95	4
100	6
95	5
100	5
95	5
90	4
90	5
85	4
100	6
90	5
70	4
95	4
70	3
55	4
50	3
55	2
50	2

v_c m/min	VR-Code
25	1
55	2
40	2
35	2
70	6
25	1
40	2
35	1

v_c m/min	VR-Code
80	6
70	6
100	7
80	6
60	5
60	5
60	5
60	5

v_c m/min	VR-Code
150	6
150	6
130	6
105	6
150	6
70	5
150	6
110	5
70	5
50	5
45	5
35	4

v_c m/min	VR-Code
85	4
70	4

THE HARTNER PROGRAMME

▼ FU 500 / FN 500

▼ GUN DRILLS

▼ INOX DRILLS

▼ MICRO-PRECISION DRILLS

▼ THREADING TOOLS

▼ TS-DRILLS

▼ TF 100 MULTI-MILL

▼ SOLID CARBIDE
MILLING CUTTERS

▼ CHAMFERING
MILLING CUTTERS

▼ MULTIPLEX

▼ MULTIPLEX HPC

▼ TM VENDING MACHINES

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