

HARTNER

Precision Cutting Tools

MICRO PRECISION DRILLS

MADE OF HSS-E-PM OR SOLID CARBIDE





Micro-precision drills without oil feed

Hartner HSS-E-PM and Solid Carbide Micro Drills – Precision starting from Diameter 0.05 mm

Smallest borings require highest quality, as the least deviation in the straightness of the boring, in the tolerance or in the surface quality on the workpiece will already mean a defect or scrap in today's miniaturised productions. For micro productions, Hartner offers precision micro drills made of HSS-E-PM and solid carbide in nominal diameters from 0.05 and 0.2 mm respectively.

Point- and flute geometry, surfaces, shank types and cutting materials are perfectly concerted to match the application, so that smallest borings are worked out well and fabricated process-safe. Our HSS-E-PM micro drills are especially applied for small-series productions, where they offer high quality at a beneficial cost-performance ratio.

On the one hand, Hartner solid carbide micro drills, as drills with a long tool life, stand by for large-scale productions. On the other hand, with the article no. 89286 we also offer a specialist for processing glass fibre reinforced plastics (GRP) in the electric and electronic industry.

See the quality and performance of our micro drills for yourself. Numerous customers in the branches of precision mechanics, horology, medical technology, conductor board manufacturing and other fields of the micro production already rely on Hartner.



Order no. 87011

page 7



A special purpose drill with oversize shank for use in the instrument and clock making industries and for general precision engineering. Specially designed for drilling structural and carbon steels, high-alloyed steels, tool steels, cast and castalloys, Magnesium-alloys, Aluminium and plastics.

Standard	DIN 1899
Tool material	HSS-E-PM
Surface	○
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	118
Web thinned	≥ Ø
Tolerance	0/-0,004

Order no. 87016

page 7



A special purpose drill with oversize shank for use in the instrument and clock making industries and for general precision engineering. Specially designed for drilling structural and carbon steels, high-alloyed steels, tool steels, cast and castalloys, Magnesium-alloys, Aluminium and plastics.

Standard	DIN 1899
Tool material	HSS-E-PM
Surface	○
Type	N
Cutting direction	left-hand
Point grinding	Facet point
Point angle°	118
Web thinned	≥ Ø
Tolerance	0/-0,004

○ bright

● TiAlN

● AlTiN

● TiN



Micro-precision drills without oil feed

Order no. 84810

page 7



A special purpose drill with oversize shank for use in the instrument and clock making industries and for general precision engineering. Specially designed for drilling structural and carbon steels, high-alloyed steels, tool steels, cast und castalloys, Magnesium-alloys, Aluminium and plastics.

Standard	DIN 1899
Tool material	HSS-E-PM
Surface	T
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	118
Web thinned $\geq \emptyset$	
Tolerance	0/-0,004

Order no. 89281

page 7



A special purpose drill with oversize shank for use in the instrument and clock making industries and for general precision engineering. Specially designed for drilling structural and carbon steels, high-alloyed steels, tool steels, cast und castalloys, Magnesium-alloys, Aluminium and plastics.

Standard	Hartner std.
Tool material	Solid carbide
Surface	○
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	130
Web thinned $\geq \emptyset$	
Tolerance	0/-0,004

Order no. 86402

page 11



Micro drill for universal application with a uniform 3 mm shank and a uniform 38 mm total length. By using just one uniform carbide bar for the production of all diameters and due to large batch sizes, a good cost-effectiveness is achieved. The combination of solid carbide and the TiAlN-coating with a special flute geometry enables optimal chip evacuation also at higher cutting speeds and feeds. Good suitability for the machining of electronic circuit boards.

Standard	Hartner std.
Tool material	Solid carbide
Surface	A
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	140
Web thinned $\geq \emptyset$	0.80
Tolerance	h7

Order no. 89286

page 13



Specially designed drill for drilling fiberglass reinforced plastics (i.e. printed circuit boards) and other resin-based thermo-hardened products likely to cause rapid wear on the lands and cutting edges of high speed steel drills.

Standard	Hartner std.
Tool material	Solid carbide
Surface	○
Type	N
Cutting direction	right-hand
Point grinding	Relieved cone
Point angle°	130
Web thinned $\geq \emptyset$	
Tolerance	h7

○ bright

● A TiAlN

● A AlTiN

● T TiN



Solid carbide Micro-precision drills for high performance machining

Small but mighty -

with and without internal cooling

Solid carbide micro-precision drills without internal cooling for drilling depths up to 4xD and 7xD are available in the diameter range from 0.8 to 3.0 mm.

Holes up to 5xD, 8xD and 15xD are the domain of solid carbide micro-precision drills with internal cooling. Thanks to the optimised tool geometry, pecking is not required for holes up to 15xD with Hartner's solid carbide micro-precision drills.

The tool design makes the solid carbide micro-precision drill 4xD without internal cooling optimally suitable as a pilot drill for the 15xD micro-precision drill with internal cooling.

Superior in every sense

Solid carbide micro-precision drills have proven their exceptional performance capabilities in various volume applications and tool life tests. The tables below document a few application examples with convincing results.

Machining examples of solid carbide micro-precision drills 8xD and 15xD with IC

Hartner no.	86408	86408	86412	86412
Diameter	1.4 mm	2.5 mm	2.5 mm	2.1 mm
Coating	AlTiN	AlTiN	AlTiN	AlTiN
Material group	cast iron	alloyed case hardened steel	alloyed heat-treatable steel	stainless steel
Material description	GG25	16MnCr5	42CrMo4	X6CrNiTi18 10
Drill. depth [mm]	8xD	8xD	15xD	15xD
Hole type	blind hole	blind hole	blind hole	blind hole
Cooling	IC 80 bar	IC 80 bar	IC 80 bar	IC 80 bar
Coolant	soluble oil	soluble oil	soluble oil	soluble oil
Machine type	machining centre	machining centre	machining centre	machining centre
v_c [mm/min]	80	120	100	60
f [mm/rev.]	0.1	0.14	0.1	0.03
Tool life [m]	150	110	60	60

Internal cooling increases tool life considerably!

A comparison between a conventional micro-precision drill w/o internal cooling for holes up to 7xD and a 8xD drill with internal cooling 86408 demonstrates the advantages of internal cooling: Tool life increases considerably.

monstrates the advantages of internal cooling: Tool life increases considerably.

Hartner no.	Competitor without internal cooling	86408 with internal cooling
Diameter	2.6 mm	2.6 mm
Coating	TiAlN	AlTiN
Material group	stainless steel	stainless steel
Material description	X105CrMo17	X105CrMo17
Drill. depth [mm]	7xD	8xD
Hole type	blind hole	blind hole
Cooling	external	internal 100 bar
Coolant	neat oil	neat oil
Machine type	machining centre	machining centre
v_c [mm/min]	53	53
f [mm/rev.]	0.06	0.06
Tool life [m]	100 workpieces	500 workpieces, end of tool life not reached!



Order no. 86400

page 14



Solid carbide special drill with AlTiN-coating and reinforced shank without internal cooling for drilling small holes up to 4 x D boring depth particularly for steel. Also applicable for machining cast iron. The special flute geometry enables optimal chip break and chip removal also at higher cutting speeds and feeds. The two-facet point grinding on every cutting edge and the special web thinning ensure a good self-centering.

Standard	Hartner std.
Tool material	Solid carbide
Surface	A
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	140
Web thinned $\geq \varnothing$	0.80
Tolerance	m7

Order no. 86401

page 15



Solid carbide special drill with AlTiN-coating and reinforced shank without internal cooling for drilling small holes up to 7 x D boring depth particularly for steel. Also applicable for machining cast iron. The special flute geometry enables optimal chip break and chip removal also at higher cutting speeds and feeds. The two-facet point grinding on every cutting edge and the special web thinning ensure a good self-centering.

Standard	Hartner std.
Tool material	Solid carbide
Surface	A
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	140
Web thinned $\geq \varnothing$	0.80
Tolerance	m7



Order no. 86405

page 16



Solid carbide special drill with AlTiN coating, reinforced shank and internal coolant supply for drilling small holes with drilling depths up to 5xD especially in steel. Also suitable for cast machining. The special flute geometry enables optimal chip break and chip removal even with high feeds and speeds. The two-facet point grind and the special web thinning offer good selfcentering.

Standard	Hartner std.
Tool material	Solid carbide
Surface	A
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	140
Web thinned $\geq \varnothing$	1.40
Tolerance	m7

Order no. 86408

page 17



Solid carbide special drill with AlTiN coating, reinforced shank and internal coolant supply for drilling small holes with drilling depths up to 8xD especially in steel. Also suitable for cast machining. The special flute geometry enables optimal chip break and chip removal even with high feeds and speeds. The two-facet point grind and the special web thinning offer good selfcentering. The micro-precision drill order no. 86400 is the perfect pilot drill thanks to its 140° point angle.

Standard	Hartner std.
Tool material	Solid carbide
Surface	A
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	135
Web thinned $\geq \varnothing$	1.40
Tolerance	h7

Order no. 86412

page 17



Solid carbide special drill with AlTiN coating, reinforced shank and internal coolant supply for drilling small holes with drilling depths up to 15xD especially in steel. Also suitable for cast machining. The special flute geometry enables optimal chip break and chip removal even with high feeds and speeds. The two-facet point grind and the special web thinning offer good selfcentering. The micro-precision drill order no. 86400 is the perfect pilot drill thanks to its 140° point angle.

Standard	Hartner std.
Tool material	Solid carbide
Surface	A
Type	N
Cutting direction	right-hand
Point grinding	Facet point
Point angle°	135
Web thinned $\geq \varnothing$	1.40
Tolerance	h7

○ bright

A TiAlN

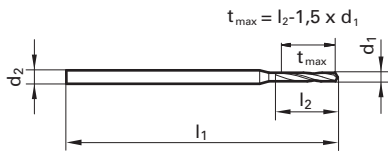
A AlTiN

T TiN



HARTNER

Micro-precision drills without oil feed



d1	d2	l1	l2	87011	87016	84810	89281
				134 right-hand N	138 left-hand N	135 right-hand N	102 right-hand N
				HSS-E-PM			Solid carbide
				Availability			
0.050	1.000	25.00	0.40	●			
0.060	1.000	25.00	0.40	●			
0.080	1.000	25.00	0.50	●			
0.090	1.000	25.00	0.50	●			
0.100	1.000	25.00	0.50	●			
0.110	1.000	25.00	0.50	●			
0.120	1.000	25.00	0.50	●			
0.130	1.000	25.00	0.80	●			
0.140	1.000	25.00	0.80	●			
0.150	1.000	25.00	0.80	●	●		
0.160	1.000	25.00	1.10	●	●		
0.170	1.000	25.00	1.10	●	●		
0.180	1.000	25.00	1.10	●	●		
0.190	1.000	25.00	1.10	●	●		
0.200	1.000	25.00	1.50	●	●	●	●
0.205	1.000	25.00	1.50	●			
0.210	1.000	25.00	1.50	●	●		
0.215	1.000	25.00	1.50	●			
0.220	1.000	25.00	1.50	●	●		
0.225	1.000	25.00	1.50	●			
0.230	1.000	25.00	1.50	●	●		
0.235	1.000	25.00	1.50	●			
0.240	1.000	25.00	1.50	●	●		
0.245	1.000	25.00	1.90	●			
0.250	1.000	25.00	1.90	●			
0.255	1.000	25.00	1.90	●			
0.260	1.000	25.00	1.90	●			
0.265	1.000	25.00	1.90	●			
0.270	1.000	25.00	1.90	●	●		
0.275	1.000	25.00	1.90	●			
0.280	1.000	25.00	1.90	●	●		
0.285	1.000	25.00	1.90	●			
0.290	1.000	25.00	1.90	●	●		
0.295	1.000	25.00	1.90	●			
0.300	1.000	25.00	1.90	●	●	●	●
0.310	1.000	25.00	2.40	●	●		
0.315	1.000	25.00	2.40	●			
0.320	1.000	25.00	2.40	●			
0.325	1.000	25.00	2.40	●			
0.330	1.000	25.00	2.40	●	●		
0.335	1.000	25.00	2.40	●			
0.340	1.000	25.00	2.40	●	●		
0.345	1.000	25.00	2.40	●			
0.350	1.000	25.00	2.40	●	●		●
0.355	1.000	25.00	2.40	●			
0.360	1.000	25.00	2.40	●	●		
0.365	1.000	25.00	2.40	●			
0.370	1.000	25.00	2.40	●	●		
0.375	1.000	25.00	2.40	●			
0.380	1.000	25.00	2.40	●	●		
0.385	1.000	25.00	3.00	●			
0.390	1.000	25.00	3.00	●	●		
0.400	1.000	25.00	3.00	●	●		●
0.405	1.000	25.00	3.00	●			

Intermediate sizes available.

○ bright

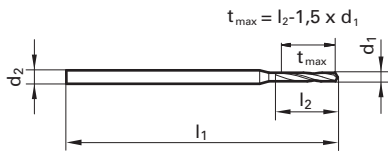
● TiAlN

● AlTiN

● TiN



Micro-precision drills without oil feed



d1	d2	l1	l2	87011	87016	84810	89281
				134 right-hand N	138 left-hand N	135 right-hand N	102 right-hand N
mm	mm	mm	mm	Availability			
0.410	1.000	25.00	3.00	●	●		
0.415	1.000	25.00	3.00	●			
0.420	1.000	25.00	3.00	●	●		
0.425	1.000	25.00	3.00	●			
0.430	1.000	25.00	3.00	●	●		
0.435	1.000	25.00	3.00	●			
0.440	1.000	25.00	3.00	●	●		
0.450	1.000	25.00	3.00	●	●	●	●
0.460	1.000	25.00	3.00	●	●		
0.470	1.000	25.00	3.00	●	●		
0.480	1.000	25.00	3.00	●	●		
0.485	1.000	25.00	3.40	●			
0.490	1.000	25.00	3.40	●	●	●	
0.495	1.000	25.00	3.40	●			
0.500	1.000	25.00	3.40	●	●	●	●
0.505	1.000	25.00	3.40	●			
0.510	1.000	25.00	3.40	●	●	●	
0.515	1.000	25.00	3.40	●			
0.520	1.000	25.00	3.40	●	●	●	
0.525	1.000	25.00	3.40	●			
0.530	1.000	25.00	3.40	●	●		
0.535	1.000	25.00	3.90	●			
0.540	1.000	25.00	3.90	●	●		
0.550	1.000	25.00	3.90	●	●		
0.555	1.000	25.00	3.90	●			
0.560	1.000	25.00	3.90	●	●		
0.570	1.000	25.00	3.90	●	●		
0.575	1.000	25.00	3.90	●			
0.580	1.000	25.00	3.90	●	●		
0.585	1.000	25.00	3.90	●			
0.590	1.000	25.00	3.90	●	●	●	
0.595	1.000	25.00	3.90	●			
0.600	1.000	25.00	3.90	●	●	●	●
0.605	1.000	25.00	4.20	●			
0.610	1.000	25.00	4.20	●	●		
0.615	1.000	25.00	4.20	●			
0.620	1.000	25.00	4.20	●	●		
0.625	1.000	25.00	4.20	●			
0.630	1.000	25.00	4.20	●	●		
0.640	1.000	25.00	4.20	●			
0.650	1.000	25.00	4.20	●			
0.660	1.000	25.00	4.20	●	●		
0.665	1.000	25.00	4.20	●			
0.670	1.000	25.00	4.20	●	●		
0.680	1.000	25.00	4.80	●	●		
0.690	1.000	25.00	4.80	●	●		
0.695	1.000	25.00	4.80	●			
0.700	1.000	25.00	4.80	●	●	●	●
0.705	1.000	25.00	4.80	●			
0.710	1.000	25.00	4.80	●	●		
0.720	1.000	25.00	4.80	●			
0.730	1.000	25.00	4.80	●			
0.740	1.000	25.00	4.80	●	●		
0.750	1.000	25.00	4.80	●	●		

Intermediate sizes available.

○ bright

● TiAlN

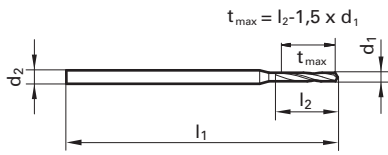
● AlTiN

● TiN



HARTNER

Micro-precision drills without oil feed



				87011	87016	84810	89281
				HSS-E-PM			Solid carbide
				134	138	135	102
				right-hand	left-hand	right-hand	right-hand
				N	N	N	N
				○	○	Ⓣ	○
d1	d2	l1	l2	Availability			
mm	mm	mm	mm				
0.760	1.000	25.00	5.30	●	●	●	
0.770	1.000	25.00	5.30	●			
0.780	1.000	25.00	5.30	●	●		
0.790	1.000	25.00	5.30	●	●		
0.800	1.500	25.00	5.30	●	●	●	●
0.810	1.500	25.00	5.30	●	●		
0.820	1.500	25.00	5.30	●	●		
0.830	1.500	25.00	5.30	●	●		
0.840	1.500	25.00	5.30	●	●		
0.850	1.500	25.00	5.30	●	●		
0.860	1.500	25.00	6.00	●	●		
0.870	1.500	25.00	6.00	●	●		
0.880	1.500	25.00	6.00	●	●	●	
0.890	1.500	25.00	6.00	●	●		
0.900	1.500	25.00	6.00	●	●	●	
0.910	1.500	25.00	6.00	●	●		
0.920	1.500	25.00	6.00	●	●	●	
0.930	1.500	25.00	6.00	●	●		
0.940	1.500	25.00	6.00	●	●		
0.950	1.500	25.00	6.00	●	●	●	
0.960	1.500	25.00	6.80	●	●		
0.970	1.500	25.00	6.80	●	●		
0.980	1.500	25.00	6.80	●	●	●	
0.990	1.500	25.00	6.80	●	●		
1.000	1.500	25.00	6.80	●	●	●	●
1.010	1.500	25.00	6.80	●	●		
1.020	1.500	25.00	6.80	●			
1.030	1.500	25.00	6.80	●			
1.040	1.500	25.00	6.80	●	●		
1.050	1.500	25.00	6.80	●	●	●	
1.060	1.500	25.00	6.80	●	●		
1.070	1.500	25.00	7.60	●			
1.080	1.500	25.00	7.60	●	●		
1.100	1.500	25.00	7.60	●	●	●	●
1.110	1.500	25.00	7.60	●			
1.120	1.500	25.00	7.60	●			
1.140	1.500	25.00	7.60	●			
1.150	1.500	25.00	7.60	●	●	●	
1.160	1.500	25.00	7.60	●	●		
1.170	1.500	25.00	7.60		●		
1.180	1.500	25.00	7.60	●		●	
1.190	1.500	25.00	8.50	●			
1.200	1.500	25.00	8.50	●	●	●	
1.210	1.500	25.00	8.50	●	●		
1.220	1.500	25.00	8.50	●	●		
1.230	1.500	25.00	8.50	●			
1.240	1.500	25.00	8.50	●			
1.250	1.500	25.00	8.50	●	●	●	●
1.260	1.500	25.00	8.50	●			
1.270	1.500	25.00	8.50	●			
1.280	1.500	25.00	8.50	●			
1.290	1.500	25.00	8.50		●		
1.300	1.500	25.00	8.50	●	●	●	●
1.310	1.500	25.00	8.50	●	●		

Intermediate sizes available.

○ bright

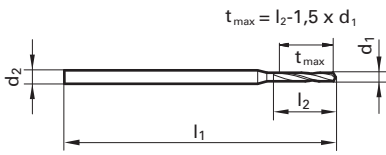
ⓐ TiAlN

ⓐ AlTiN

Ⓣ TiN



Micro-precision drills without oil feed



				87011	87016	84810	89281
				HSS-E-PM			Solid carbide
				134	138	135	102
				right-hand	left-hand	right-hand	right-hand
				N	N	N	N
				○	○	●	○
d1	d2	l1	l2	Availability			
mm	mm	mm	mm				
1.320	1.500	25.00	8.50	●	●		
1.340	1.500	25.00	9.50	●			
1.350	1.500	25.00	9.50	●	●		
1.380	1.500	25.00	9.50	●			
1.390	1.500	25.00	9.50	●			
1.400	1.500	25.00	9.50	●	●	●	
1.410	1.500	25.00	9.50	●			
1.420	1.500	25.00	9.50	●			
1.430	1.500	25.00	9.50	●			
1.440	1.500	25.00	9.50	●			
1.450	1.500	25.00	9.50	●	●	●	
1.500	2.000	30.00	9.50	●		●	
1.600	2.000	30.00	10.60	●			
1.630	2.000	30.00	10.60	●			
1.700	2.000	30.00	10.60	●			
1.800	2.000	30.00	11.80	●			
1.850	2.000	30.00	11.80	●			
1.900	2.000	30.00	11.80	●			

Intermediate sizes available.

○ bright

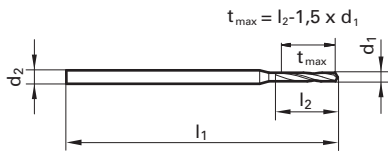
● TiAlN

● AlTiN

● TiN



Micro-precision drills without oil feed



d1	d2	l1	l2	Availability
mm	mm	mm	mm	
0.100	3.000	38.00	1.20	●
0.150	3.000	38.00	2.00	●
0.200	3.000	38.00	2.50	●
0.250	3.000	38.00	3.00	●
0.300	3.000	38.00	5.00	●
0.310	3.000	38.00	5.00	●
0.350	3.000	38.00	6.00	●
0.370	3.000	38.00	6.00	●
0.400	3.000	38.00	7.00	●
0.450	3.000	38.00	7.00	●
0.500	3.000	38.00	7.00	●
0.550	3.000	38.00	7.00	●
0.600	3.000	38.00	7.00	●
0.640	3.000	38.00	7.00	●
0.650	3.000	38.00	7.00	●
0.700	3.000	38.00	8.00	●
0.710	3.000	38.00	8.00	●
0.720	3.000	38.00	8.00	●
0.740	3.000	38.00	8.00	●
0.750	3.000	38.00	8.00	●
0.760	3.000	38.00	8.00	●
0.770	3.000	38.00	8.00	●
0.780	3.000	38.00	8.00	●
0.790	3.000	38.00	8.00	●
0.800	3.000	38.00	10.00	●
0.810	3.000	38.00	10.00	●
0.820	3.000	38.00	10.00	●
0.830	3.000	38.00	10.00	●
0.840	3.000	38.00	10.00	●
0.850	3.000	38.00	10.00	●
0.860	3.000	38.00	10.00	●
0.870	3.000	38.00	10.00	●
0.880	3.000	38.00	10.00	●
0.890	3.000	38.00	10.00	●
0.900	3.000	38.00	10.00	●
0.910	3.000	38.00	10.00	●
0.920	3.000	38.00	10.00	●
0.930	3.000	38.00	10.00	●
0.940	3.000	38.00	10.00	●
0.950	3.000	38.00	10.00	●
0.960	3.000	38.00	10.00	●
0.970	3.000	38.00	10.00	●
0.980	3.000	38.00	10.00	●
0.990	3.000	38.00	10.00	●
1.000	3.000	38.00	10.00	●
1.100	3.000	38.00	10.00	●
1.110	3.000	38.00	10.00	●
1.150	3.000	38.00	10.00	●
1.200	3.000	38.00	10.00	●
1.210	3.000	38.00	10.00	●
1.400	3.000	38.00	10.00	●
1.450	3.000	38.00	10.00	●
1.500	3.000	38.00	10.00	●
1.510	3.000	38.00	10.00	●

86402
 Solid carbide
 102
 right-hand
 N
 A

Intermediate sizes available.

○ bright

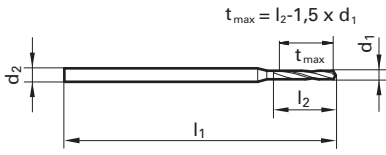
● TiAlN

● AlTiN

● TiN



Micro-precision drills without oil feed



d1	d2	l1	l2	
mm	mm	mm	mm	
1.520	3.000	38.00	10.00	●
1.550	3.000	38.00	10.00	●
1.600	3.000	38.00	12.00	●
1.650	3.000	38.00	12.00	●
1.700	3.000	38.00	12.00	●
1.800	3.000	38.00	12.00	●
1.810	3.000	38.00	12.00	●
1.830	3.000	38.00	12.00	●
1.850	3.000	38.00	12.00	●
1.900	3.000	38.00	12.00	●
1.920	3.000	38.00	12.00	●
1.950	3.000	38.00	12.00	●
1.980	3.000	38.00	12.00	●
2.000	3.000	38.00	12.00	●
2.050	3.000	38.00	12.00	●
2.100	3.000	38.00	12.00	●
2.400	3.000	38.00	12.00	●
2.500	3.000	38.00	12.00	●
2.600	3.000	38.00	12.00	●
2.750	3.000	38.00	12.00	●
2.950	3.000	38.00	12.00	●
3.000	3.000	38.00	12.00	●

86402
Solid carbide
 102
 right-hand
 N
 ●

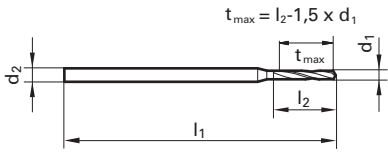
Availability

Intermediate sizes available.

- bright
- TiAIN
- AlTiN
- TiN



Micro-precision drills without oil feed



d1	d2	l1	l2	Availability
mm	mm	mm	mm	
0.500	0.500	38.00	8.50	●
0.600	0.600	38.00	9.50	●
0.650	0.650	38.00	10.50	●
0.700	0.700	38.00	10.50	●
0.750	0.750	38.00	12.50	●
0.800	0.800	38.00	12.50	●
0.850	0.850	38.00	14.50	●
0.900	0.900	38.00	14.50	●
1.000	1.000	38.00	17.00	●
1.050	1.050	38.00	17.00	●
1.100	1.100	38.00	17.00	●
1.400	1.400	38.00	17.00	●
1.450	1.450	38.00	17.00	●

89286
Solid carbide
 102
 right-hand
 N
 ○

Availability

Intermediate sizes available.

○ bright

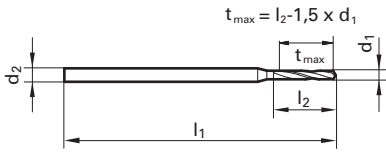
● TiAlN

● AlTiN

● TiN



Micro-precision drills without oil feed 4 x D



d1	d2	l1	l2	Availability
mm	mm	mm	mm	
0.500	3.000	47.00	3.00	●
0.550	3.000	47.00	3.30	●
0.600	3.000	47.00	3.60	●
0.650	3.000	47.00	3.90	●
0.700	3.000	47.00	4.20	●
0.750	3.000	47.00	4.50	●
0.800	3.000	47.00	4.80	●
0.850	3.000	47.00	5.10	●
0.900	3.000	47.00	5.40	●
0.950	3.000	47.00	5.70	●
1.000	3.000	47.00	6.00	●
1.050	3.000	47.00	6.30	●
1.100	3.000	47.00	6.60	●
1.150	3.000	47.00	6.90	●
1.200	3.000	47.00	7.20	●
1.250	3.000	47.00	7.50	●
1.300	3.000	47.00	7.80	●
1.350	3.000	47.00	8.10	●
1.400	3.000	47.00	8.40	●
1.450	3.000	47.00	8.70	●
1.500	3.000	47.00	9.00	●
1.550	3.000	47.00	9.30	●
1.590	3.000	47.00	9.60	●
1.600	3.000	47.00	9.60	●
1.650	3.000	47.00	9.90	●
1.700	3.000	47.00	10.20	●
1.750	3.000	47.00	10.50	●
1.800	3.000	52.00	10.80	●
1.850	3.000	52.00	11.10	●
1.900	3.000	52.00	11.40	●
1.950	3.000	52.00	11.70	●
1.980	4.000	59.00	12.00	●
2.000	4.000	59.00	12.00	●
2.050	4.000	59.00	12.30	●
2.100	4.000	59.00	12.60	●
2.150	4.000	59.00	12.90	●
2.200	4.000	59.00	13.20	●
2.250	4.000	59.00	13.50	●
2.300	4.000	59.00	13.80	●
2.350	4.000	59.00	14.10	●
2.380	4.000	59.00	14.40	●
2.400	4.000	59.00	14.40	●
2.450	4.000	59.00	14.70	●
2.500	4.000	59.00	15.00	●
2.550	4.000	59.00	15.30	●
2.600	4.000	59.00	15.60	●
2.650	4.000	59.00	15.90	●
2.700	4.000	59.00	16.20	●
2.750	4.000	59.00	16.50	●
2.780	4.000	59.00	16.80	●
2.800	4.000	59.00	16.80	●
2.850	4.000	59.00	17.10	●
2.900	4.000	59.00	17.40	●
2.950	4.000	59.00	17.70	●
3.000	4.000	59.00	18.00	●

Intermediate sizes available.

○ bright

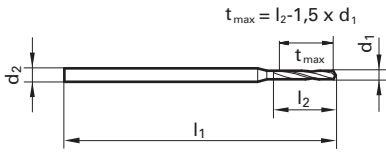
● TiAlN

● AlTiN

● TiN



Micro-precision drills without oil feed 7 x D



d1	d2	l1	l2	Availability
mm	mm	mm	mm	
0.500	3.000	47.00	4.00	●
0.550	3.000	47.00	4.40	●
0.600	3.000	47.00	4.80	●
0.650	3.000	47.00	5.20	●
0.700	3.000	47.00	5.60	●
0.750	3.000	47.00	6.00	●
0.800	3.000	47.00	6.40	●
0.850	3.000	47.00	6.80	●
0.900	3.000	47.00	7.20	●
0.950	3.000	47.00	7.60	●
1.000	3.000	47.00	8.00	●
1.050	3.000	47.00	8.40	●
1.100	3.000	47.00	8.80	●
1.150	3.000	47.00	9.20	●
1.200	3.000	52.00	10.80	●
1.250	3.000	52.00	11.30	●
1.300	3.000	52.00	11.70	●
1.350	3.000	52.00	12.20	●
1.400	3.000	52.00	12.60	●
1.450	3.000	52.00	13.10	●
1.500	3.000	52.00	13.50	●
1.550	3.000	52.00	14.00	●
1.590	3.000	52.00	14.40	●
1.600	3.000	52.00	14.40	●
1.650	3.000	52.00	14.90	●
1.700	3.000	52.00	15.30	●
1.750	3.000	52.00	15.80	●
1.800	3.000	52.00	16.20	●
1.850	3.000	52.00	16.70	●
1.900	3.000	52.00	17.10	●
1.950	3.000	52.00	17.60	●
1.980	4.000	63.00	18.00	●
2.000	4.000	63.00	18.00	●
2.050	4.000	63.00	18.50	●
2.100	4.000	63.00	18.90	●
2.150	4.000	63.00	19.40	●
2.200	4.000	63.00	19.80	●
2.250	4.000	63.00	20.30	●
2.300	4.000	63.00	20.70	●
2.350	4.000	63.00	21.20	●
2.380	4.000	63.00	21.60	●
2.400	4.000	63.00	21.60	●
2.450	4.000	63.00	22.10	●
2.500	4.000	63.00	22.50	●
2.550	4.000	63.00	23.00	●
2.600	4.000	67.00	23.40	●
2.650	4.000	67.00	23.90	●
2.700	4.000	67.00	24.30	●
2.750	4.000	67.00	24.80	●
2.780	4.000	67.00	25.20	●
2.800	4.000	67.00	25.20	●
2.850	4.000	67.00	25.70	●
2.900	4.000	67.00	26.10	●
2.950	4.000	67.00	26.60	●
3.000	4.000	67.00	27.00	●

Intermediate sizes available.

○ bright

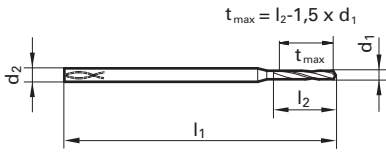
● TiAlN

● AlTiN

● TiN



Micro-precision drills with oil feed 5 x D



d1	d2	l1	l2	Availability
mm	mm	mm	mm	
1.400	4.000	52.00	11.00	●
1.450	4.000	52.00	12.00	●
1.500	4.000	52.00	12.00	●
1.550	4.000	52.00	12.00	●
1.590	4.000	52.00	13.00	●
1.600	4.000	52.00	13.00	●
1.650	4.000	52.00	13.00	●
1.700	4.000	56.00	14.00	●
1.750	4.000	56.00	14.00	●
1.800	4.000	56.00	14.00	●
1.850	4.000	56.00	15.00	●
1.900	4.000	56.00	15.00	●
1.950	4.000	56.00	16.00	●
1.980	4.000	56.00	16.00	●
2.000	4.000	56.00	16.00	●
2.050	4.000	56.00	16.00	●
2.100	4.000	62.00	17.00	●
2.150	4.000	62.00	17.00	●
2.200	4.000	62.00	18.00	●
2.250	4.000	62.00	18.00	●
2.300	4.000	62.00	18.00	●
2.350	4.000	62.00	19.00	●
2.380	4.000	62.00	19.00	●
2.400	4.000	62.00	19.00	●
2.450	4.000	62.00	20.00	●
2.500	4.000	62.00	20.00	●
2.550	4.000	62.00	20.00	●
2.600	4.000	66.00	21.00	●
2.650	4.000	66.00	21.00	●
2.700	4.000	66.00	22.00	●
2.750	4.000	66.00	22.00	●
2.780	4.000	66.00	22.00	●
2.800	4.000	66.00	22.00	●
2.850	4.000	66.00	23.00	●
2.900	4.000	66.00	23.00	●
2.950	4.000	66.00	24.00	●
3.000	4.000	66.00	24.00	●

86405
 Solid carbide
 164
 right-hand
 N
 ●

Availability

Intermediate sizes available.

○ bright

● TiAlN

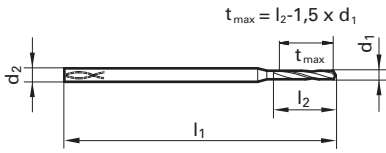
● AlTiN

● TiN



HARTNER

Micro-precision drills with oil feed 8 x D/15 x D



d1	d2	l1	l2
mm	mm	mm	mm
1.400	4.000	52.00	15.00
1.500	4.000	52.00	17.00
1.600	4.000	52.00	18.00
1.700	4.000	56.00	19.00
1.800	4.000	56.00	20.00
1.900	4.000	56.00	21.00
2.000	4.000	56.00	22.00
2.100	4.000	62.00	23.00
2.200	4.000	62.00	24.00
2.300	4.000	62.00	25.00
2.400	4.000	62.00	26.00
2.500	4.000	62.00	28.00
2.600	4.000	66.00	29.00
2.700	4.000	66.00	30.00
2.800	4.000	66.00	31.00
2.900	4.000	66.00	32.00
3.000	4.000	66.00	33.00

86408

Solid carbide

164

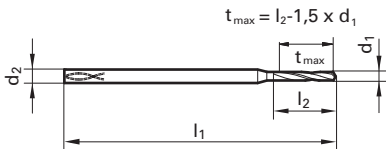
right-hand

N



Availability

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-
-
-
-
-
-



d1	d2	l1	l2
mm	mm	mm	mm
1.400	4.000	62.00	25.00
1.500	4.000	62.00	27.00
1.600	4.000	62.00	29.00
1.700	4.000	70.00	31.00
1.800	4.000	70.00	32.00
1.900	4.000	70.00	34.00
2.000	4.000	70.00	36.00
2.100	4.000	78.00	38.00
2.200	4.000	78.00	40.00
2.300	4.000	78.00	42.00
2.400	4.000	78.00	44.00
2.500	4.000	78.00	45.00
2.600	4.000	87.00	47.00
2.700	4.000	87.00	48.00
2.800	4.000	87.00	50.00
2.900	4.000	87.00	52.00
3.000	4.000	87.00	54.00

86412

Solid carbide

164

right-hand

N



Availability

-
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-
-

Intermediate sizes available.

○ bright

● TiAlN

● AlTiN

● TiN



Recommendations

Pilot drilling

For the application of solid carbide micro precision drills 15xD we recommend a pilot hole 1xD up to 2xD depth. For this pilot hole, the solid carbide micro precision drill 4xD is optimally suitable. Its point angle and its diameter tolerance are perfectly adapted.

Filter quality

When applying solid carbide micro precision drills, we recommend constant monitoring of the lubricant's filter quality due to the extremely small coolant duct diameters.

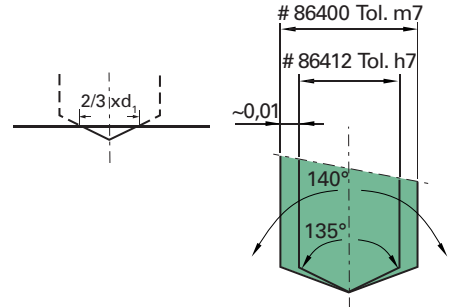
Centering

In order to achieve full performance with solid carbide micro precision drills from 8xD drilling depth, we recommend centering. The solid carbide micro precision drill up to 4xD, Hartner no. 86400, can be applied for this purpose. The centering diameter should be approximately 2/3xD.

Drill Ø mm	Feed column no.									
	101	102	103	104	105	106	107	108	109	
	f (mm/rev.)									
0.10	0.002	0.003	0.003	0.004	0.006	0.007	0.010	0.013	0.016	
0.16	0.002	0.003	0.004	0.005	0.007	0.009	0.012	0.016	0.022	
0.25	0.003	0.004	0.005	0.007	0.009	0.011	0.014	0.019	0.024	
0.30	0.004	0.005	0.007	0.009	0.011	0.015	0.019	0.025	0.033	
0.50	0.005	0.007	0.008	0.011	0.014	0.019	0.024	0.031	0.041	
0.63	0.007	0.009	0.012	0.015	0.020	0.026	0.034	0.044	0.057	
0.80	0.010	0.013	0.016	0.020	0.024	0.031	0.038	0.048	0.060	
1.00	0.020	0.024	0.029	0.035	0.041	0.050	0.060	0.072	0.086	
1.50	0.030	0.035	0.040	0.046	0.052	0.060	0.069	0.080	0.092	
2.00	0.040	0.046	0.053	0.061	0.070	0.080	0.093	0.106	0.122	

☒ with external cooling
 ■ with internal cooling

Drill Ø mm	Feed column no. for art. no. 86400/86401/86402/86405/86408/86412													
	56	57	58	59	60	61	62	63	64	65	66	67	68	
	f (mm/rev.)													
0.50	0.006	0.012	0.018	0.022	0.030	0.035	0.040	0.045	0.050	0.050	0.055	0.060	0.060	
0.80	0.008	0.016	0.024	0.032	0.040	0.050	0.060	0.070	0.080	0.080	0.080	0.090	0.090	
1.00	0.012	0.022	0.032	0.042	0.060	0.070	0.080	0.090	0.100	0.100	0.110	0.110	0.120	
1.50	0.021	0.036	0.051	0.066	0.090	0.100	0.120	0.130	0.150	0.150	0.160	0.170	0.180	
2.00	0.032	0.052	0.072	0.092	0.120	0.140	0.160	0.180	0.200	0.210	0.220	0.230	0.240	
2.50	0.045	0.070	0.095	0.120	0.150	0.170	0.200	0.220	0.250	0.260	0.270	0.280	0.300	
3.00	0.060	0.090	0.120	0.150	0.180	0.210	0.240	0.270	0.300	0.310	0.330	0.340	0.360	



STOP All drilling tools from 8xD must be guided during spot drilling. They must never operate at full speed without support in the machine shop

Material	Material example <i>Figures in bold = material no. to DIN EN 10 027</i>	Tens. strength MPa N/mm ²	Hard- ness
Common structural steels	1.0035 S185, 1.0486 StE P275N, 1.0345 P235GH, 1.0425 P265GH 1.0050 E295, 1.0070 E360, 1.8937 P500NH		
Free-cutting steels	1.0718 11SMnPb30, 1.0736 115Mn37 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20		
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C45E 1.0601 C60, 1.1221 C60E		
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4		
Unalloyed case hardened steels	1.0301 C10, 1.1121 C10E		
Alloyed case hardened steels	1.7043 38Cr4 1.5752 14NiCr14, 1.7131 16MnCr5, 1.7264 20CrMo5		
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7		
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4		
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 61CrV4		
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4		
Stainless steels, sulphured	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18 9		
austenitic	1.4301 X5CrNi18 10, 1.4541 X6CrNiTi18 10, 1.4571 X6CrNiMoTi 17 12 2		
martensitic	1.4057 X17CrNi16-1, 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18 2		
Hardened steels	-		
Special alloys	Nimonic, Inconel, Monel, Hastelloy		
Cast iron	EN-GJL-100 ... EN-GJL-200 (bisher GG10 ... GG20) EN-GJL-250 ... EN-GJL-350 (bisher GG25 ... GG45)		
Spheroidal graphite and malleable cast iron	EN-GJMW-350-4, EN-GJMB-550-4, EN-GJS-500-7 (bisher GTW35, GTS55, GGG50) EN-GJMB-700-2, EN-GJS-700-2 (bisher GTW65, GTS70, GGG70)		
Chilled cast iron	-		
Ti and Ti-alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1		
Aluminium and Al-alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1		
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5		
Al cast iron ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9		
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg		
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3		
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb		
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2		
long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5		
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn		
long-chipping	2.0790 CuNi18Zn19Pb 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2		
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren		
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon		
Kevlar	Kevlar		
Glass, carbon concent. plastics	GFK/CFK		

○ bright

● TiAlN

● AlTiN

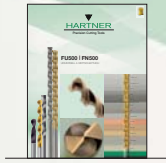
● TiN

Tool material	HSS-E-PM	HSS-E-PM	Sol. carb.	Sol. carb.	Sol. carb.	Solid carbide	Solid carbide
Surface finish	○ ○	Ⓣ	○	ⓐ	○	ⓐ ⓐ	ⓐ ⓐ ⓐ
Cooling	☒ ☒	☒	☒	☒	☒	☒ ☒	☒ ☒ ☒
Drilling depth					~ 10 x D	~ 4 x D ~ 7 x D	~ 5 x D ~ 8 x D ~ 15 x D
Article no.	87011 87016	84810	89281	86402	89286	86400 86401	86405 86408 86412



V _c m/min	Feed column no.	V _c m/min	Feed column no.	V _c m/min	Feed col. no.	V _c m/min	Feed col. no.	V _c m/min	Feed col. no.	V _c m/min	Feed column no.	V _c m/min	Feed column no.	
21	106	27	106	50	105	100	62	100	64	62	105	62	58	58
18	105	23	105	35	104	100	62	100	64	62	100	62	58	58
18	106	23	106	50	105	100	62	100	64	62	105	62	59	59
16	105	21	105	45	104	90	61	90	63	61	90	61	59	59
20	105	26	105	45	104	90	62	90	64	62	95	62	58	58
18	105	23	105	35	104	90	62	90	64	62	95	62	58	58
14	104	18	104	30	103	90	61	90	63	61	90	61	58	58
14	104	18	104	30	103	90	61	90	63	61	90	61	58	58
12	103	16	103	30	103	90	61	90	63	61	90	61	58	58
18	106	23	106	50	103	100	61	100	63	61	100	61	57	57
14	104	18	104	40	103	85	61	85	63	61	85	61	58	58
12	103	16	103	40	103	70	60	70	62	60	70	60	58	58
14	104	18	104	25	103	70	60	70	62	60	70	60	57	57
12	103	16	103	25	103	60	60	60	62	60	60	60	57	57
16	104	20	104	25	103	50	60	50	62	60	50	60	58	58
14	103	18	103	25	103	60	60	60	62	60	50	60	58	58
14	103	18	103	25	103	60	60	60	62	60	50	60	58	58
108	102	10	102	20	102	60	57	60	57	57	50	57	57	57
106	104	108	104	25	103	60	57	60	57	57	50	57	57	57
106	103	108	103	25	102	30	57	30	57	57	70	57	57	57
106	103	108	103	25	102	15	56	15	56	56	60	56	56	56
				15	104	30	57	30	57	57	70	57	57	57
				15	103	10	56	10	56	56	25	56	56	56
26	106	33	106	80	105	130	66	<150	68	66	<150	60	60	60
22	106	28	106	60	105	130	66	<140	68	66	<140	60	60	60
18	106	23	106	60	105	130	66	<140	68	66	<140	60	60	60
22	106	28	106	50	105	120	65	<130	67	65	<130	60	60	60
				45	104									
				25	104									
				160	107									
				150	106									
26	107	33	107	100	106	15	56	15	56	56	35	56	56	56
18	106	23	106	60	106	15	56	15	56	56	35	56	56	56
75	106	97	106	150	105	70	68	70	68	68	70	68	68	68
42	105	53	105	50	105	70	68	70	68	68	70	68	68	68
				67	106	135	59	135	59	59	135	59	59	59
				67	106	135	59	135	59	59	135	59	59	59
22	105	28	105	44	104									
22	104	28	104	68	103									
18	104	23	104	49	103									
13	104	16	104	53	103									
		14	104	36	103									
16	104	20	104	50	103			50	104					
18	104	23	104	36	103			40	103					
				60	104			80	103					

Our programme:



FU 500/FN500



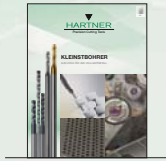
Gun Drills



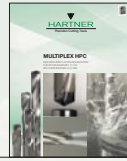
INOX Drills



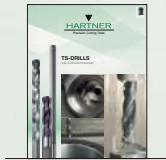
Multiplex



Micro Precision Drills



Multiplex HPC



TS-Drills



Standard Range



Highlights



TM Vending Machines



Threading Tools



Solid Carbide
High Performance Milling Cutters



De-burring Tools



Chamfering Milling Cutters



TF 100 Multi-Mill

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