

# GUHRING

## Solid carbide and HSS-E-PM-micro-precision drills

for the precise manufacture of smallest holes  
from 0.05 mm to 3.0 mm diameter



## Micro-precision drills The complete program

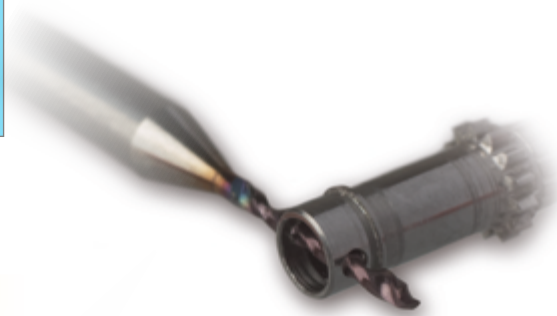
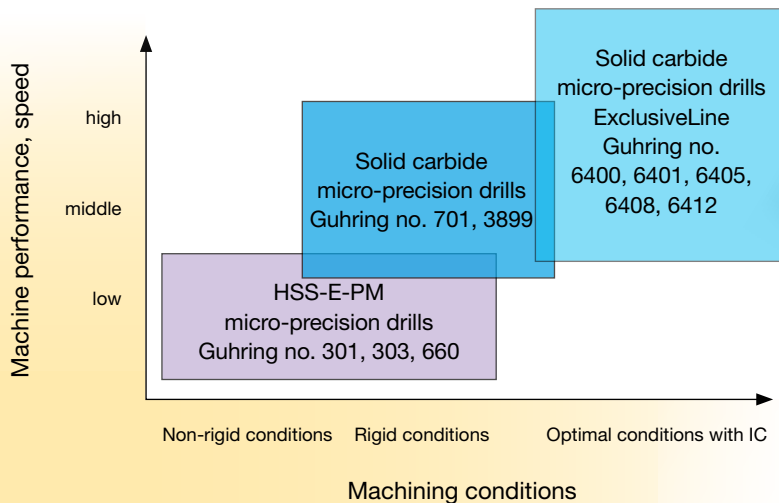
GUHRING - YOUR WORLD-WIDE PARTNER

# Types of micro-precision drills

## Advantages and range of application

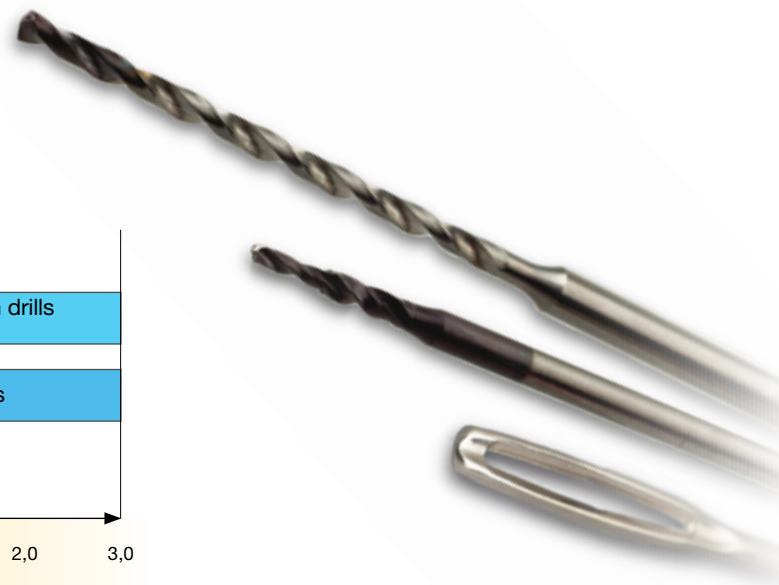
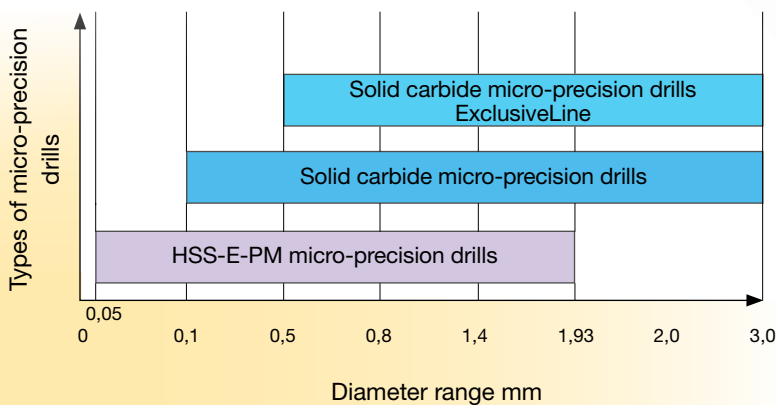
For volume production of large batch sizes with high-performance and internal cooling machine conditions as well as for machining tasks of smaller batch sizes or for limited

machine performance and difficult machining conditions Guhring provides the optimal solution.



## Range of program

The comprehensive Guhring solid carbide and HSS-E-PM micro-precision drill range covers the entire diameter range from 0.05 mm to 3.00 mm:



Guhring's micro-precision drill range including solid carbide and powder metallurgical high speed steel (HSS-E-PM) is optimally suitable for the production of the smallest holes in all fields of application.

The manufacture of highly accurate small diameter holes requires maximum quality and is one of the most demanding drilling operations.

For these tasks and for every user, Guhring's comprehensive standard range includes the optimal micro-precision drill.

## HSS-E-PM micro-precision drills

Guhring's micro-precision drills in highly efficient powder metallurgical HSS-E steel excel with a very high wear-resistance, high toughness and cutting edge stability that is especially important with difficult, less rigid machining conditions. The powder metallurgical produced HSS-E steel features a very homogeneous structure having a positive effect on the consistently high performance capability of the micro-precision drills.



HSS-E-PM micro-precision drills are hence suitable, for example, for application on multi-spindle machines, on machines with speed limitations or for the manufacture of small and average batch sizes as here they offer high quality with an optimal price-performance ratio. For higher demands on tool life and cutting parameters Guhring provides HSS-E-PM micro-precision in the standard range also with TiN-coating. Even for special applications where left-hand cutting drilling tools are required Guhring can offer a standard solution.

## Solid carbide micro-precision drills

Guhring's solid carbide micro-precision drills without internal cooling cover a comprehensive diameter range from 0.1 mm to 3.0 mm. With solid carbide micro-precision drills it is possible to achieve higher cutting parameters and longer tool life when machining conditions are more stable and machines



are more powerful compared to HSS-E-PM micro-precision drills. The reason for this is the use of ultra-fine carbide that features a very high hardness, heat-resistance and wear-resistance and makes the enormous performance capabilities of solid carbide micro-precision drills possible.

## Solid carbide micro-precision drills ExclusiveLine also with internal cooling

Solid carbide ExclusiveLine micro-precision drills, available with or without coolant ducts, make high-performance machining in most materials possible.

Micro-precision drills demonstrate their full performance potential in volume production of large batch sizes with rigid machine conditions, high machine performance and spindle speeds. The 2-facet point grind per cutting edge with ground cutting edge honing permits high cutting values as well as optimal chip breaking. Chip spaces with special flute geometry evacuate the chips safely from the hole.

For drilling depths to 4xD and 7xD, solid carbide micro-precision drills without internal cooling are available in the diameter range from 0.5 to 3.0 mm.



Especially for the machining of stainless steels and special alloys as well as deep holes 5xD, 8xD and 15xD solid carbide micro-precision drills with internal cooling prove their performance capability. Thanks to the optimised tool geometry pecking is not necessary with Guhring's solid carbide micro-precision drills up to 15xD.

The tools are designed so that solid carbide micro-precision drills up to 4xD without internal cooling and up to 5xD with internal cooling are optimally suited as pilot drill for the 15xD micro-precision drill with internal cooling.

## Special solutions to customer requirements

In addition to the standard micro-precision mentioned, Guhring also supplies HSS-E-PM and solid carbide micro-precision drills as special tools at customer request. They include:

- intermediate dimensions to the standard range



- stepped tools for stepped holes or countersink holes
- special lengths up to 30xD drilling depth
- different shank variants
- alternative coatings

# Range of application

Guhring's HSS-E-PM and solid carbide micro-precision drills can be used in numerous fields of application. A large number

of customers in the following industries already rely on micro-precision drills from Guhring:

## Paper industry

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- paper roller holes

## Electrical industry

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- plug connectors

## Food industry

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- mincing machine matrixes
- colanders

## Energy technology

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- heat exchangers

## Watch and jewellery industry

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- chain links
- gear finishing

## Medical technology

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- dental technology  
drive shafts

## Precision mechanics / miniature precision components

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- shafts
- bushings
- bolts

## Automotive industry




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- injector nozzles / injectors
- pumps, hydraulic systems
- ventilation holes in tyre  
manufacturing



## Program

Standard	Type	Tool illustration	Cutting direction	Tool material	Surface finish	d1	Guhring no.	Discount group	Standard range, page
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### HSS-E-PM micro-precision drills without internal cooling

DIN 1899	N		right-hand	HSS-E-PM	○	0.050 - 1.930	301	134	6
DIN 1899	N		left-hand	HSS-E-PM	○	0.130 - 1.850	303	138	12
DIN 1899	N		right-hand	HSS-E-PM	Ⓢ	0.160 - 1.900	660	135	17




### Solid carbide micro-precision drills without internal cooling

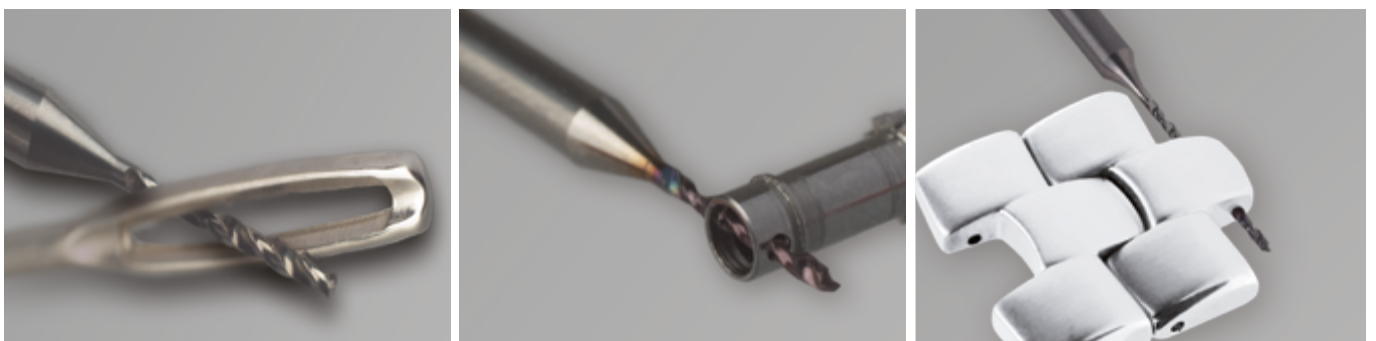
Guhring std.	N		right-hand	Solid carbide	○	0.200 - 1.400	701	102	20
Guhring std.	N		right-hand	Solid carbide	Ⓐ	0.100 - 3.000	3899	102	21

### Solid carbide micro-precision drills ExclusiveLine without int. cooling

Guhring std.	N		4xD	Solid carbide	Ⓐ	0.500 - 3.000	6400	164	23
Guhring std.	N		7xD	Solid carbide	Ⓐ	0.500 - 3.000	6401	164	25

### Solid carbide micro-precision drills ExclusiveLine with internal cooling

Guhring std.	N		5xD	Solid carbide	Ⓐ	1.400 - 3.000	6405	164	27
Guhring std.	N		8xD	Solid carbide	Ⓐ	1.400 - 3.000	6408	164	28
Guhring std.	N		15xD	Solid carbide	Ⓐ	1.400 - 3.000	6412	164	29



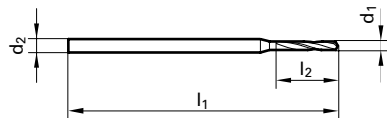
# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	134
<b>Guhring no.</b>	<b>301</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
0.050	1.000	25.00	0.40	●
0.060	1.000	25.00	0.40	●
0.070	1.000	25.00	0.50	●
0.075	1.000	25.00	0.50	●
0.080	1.000	25.00	0.50	●
0.090	1.000	25.00	0.50	●
0.100	1.000	25.00	0.50	●
0.105	1.000	25.00	0.50	●
0.110	1.000	25.00	0.50	●
0.115	1.000	25.00	0.50	●
0.120	1.000	25.00	0.50	●
0.121	1.000	25.00	0.80	○
0.125	1.000	25.00	0.80	●
0.128	1.000	25.00	0.80	●
0.130	1.000	25.00	0.80	●
0.140	1.000	25.00	0.80	●
0.143	1.000	25.00	0.80	●
0.145	1.000	25.00	0.80	●
0.147	1.000	25.00	0.80	○
0.150	1.000	25.00	0.80	●
0.155	1.000	25.00	1.10	●
0.160	1.000	25.00	1.10	●
0.170	1.000	25.00	1.10	●
0.175	1.000	25.00	1.10	●
0.180	1.000	25.00	1.10	●
0.190	1.000	25.00	1.10	●
0.195	1.000	25.00	1.50	●
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	●

external cooling

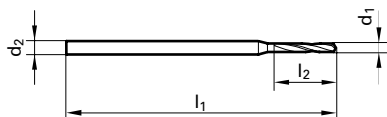
# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	134
<b>Guhring no.</b>	<b>301</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
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	●
0.305	1.000	25.00	2.40	●
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	●
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	●
0.432	1.000	25.00	3.00	●
0.435	1.000	25.00	3.00	●
0.440	1.000	25.00	3.00	●
0.445	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	●
0.475	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	●

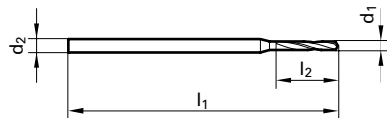
external cooling

# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	134
<b>Guhring no.</b>	<b>301</b>
DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
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	●
0.632	1.000	25.00	4.20	●
0.640	1.000	25.00	4.20	●
0.650	1.000	25.00	4.20	●
0.655	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	●
0.675	1.000	25.00	4.80	●
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	●
0.725	1.000	25.00	4.80	●

external cooling



# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	134
<b>Guhring no.</b>	<b>301</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
0.730	1.000	25.00	4.80	●
0.740	1.000	25.00	4.80	●
0.750	1.000	25.00	4.80	●
0.760	1.000	25.00	5.30	●
0.770	1.000	25.00	5.30	●
0.775	1.000	25.00	5.30	○
0.780	1.000	25.00	5.30	●
0.790	1.000	25.00	5.30	●
0.795	1.500	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	●
0.825	1.500	25.00	5.30	●
0.830	1.500	25.00	5.30	●
0.840	1.500	25.00	5.30	●
0.845	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	●
0.925	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	●
1.055	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	●

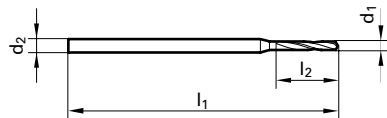
external cooling

# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	☒
Discount group	134
<b>Guhring no.</b>	<b>301</b>
DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
1.090	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	●
1.130	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	●
1.175	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	●
1.265	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	●
1.320	1.500	25.00	8.50	●
1.325	1.500	25.00	9.50	●
1.330	1.500	25.00	9.50	●
1.340	1.500	25.00	9.50	●
1.350	1.500	25.00	9.50	●
1.370	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	●
1.460	2.000	30.00	9.50	●
1.470	2.000	30.00	9.50	●
1.500	2.000	30.00	9.50	●

external cooling ☒

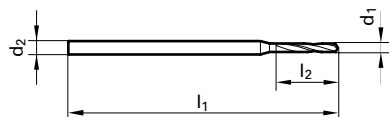
# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	134
<b>Guhring no.</b>	<b>301</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
1.520	2.000	30.00	10.60	●
1.530	2.000	30.00	10.60	●
1.540	2.000	30.00	10.60	●
1.550	2.000	30.00	10.60	●
1.590	2.000	30.00	10.60	●
1.600	2.000	30.00	10.60	●
1.610	2.000	30.00	10.60	●
1.630	2.000	30.00	10.60	●
1.640	2.000	30.00	10.60	○
1.650	2.000	30.00	10.60	●
1.660	2.000	30.00	10.60	●
1.690	2.000	30.00	10.60	○
1.700	2.000	30.00	10.60	●
1.710	2.000	30.00	11.80	●
1.715	2.000	30.00	11.80	○
1.730	2.000	30.00	11.80	●
1.745	2.000	30.00	11.80	●
1.750	2.000	30.00	11.80	●
1.775	2.000	30.00	11.80	●
1.800	2.000	30.00	11.80	●
1.830	2.000	30.00	11.80	●
1.840	2.000	30.00	11.80	●
1.850	2.000	30.00	11.80	●
1.860	2.000	30.00	11.80	●
1.900	2.000	30.00	11.80	●
1.920	2.000	30.00	13.20	●
1.930	2.000	30.00	13.20	○

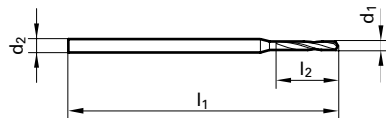
external cooling

# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	☒
Discount group	138
<b>Guhring no.</b>	<b>303</b>
DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- left-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
0.130	1.000	25.00	0.80	○
0.140	1.000	25.00	0.80	○
0.150	1.000	25.00	0.80	○
0.155	1.000	25.00	1.10	○
0.160	1.000	25.00	1.10	●
0.170	1.000	25.00	1.10	○
0.175	1.000	25.00	1.10	○
0.180	1.000	25.00	1.10	○
0.185	1.000	25.00	1.10	○
0.190	1.000	25.00	1.10	●
0.195	1.000	25.00	1.50	○
0.200	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	○
0.290	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	○
0.330	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	●
0.370	1.000	25.00	2.40	●
0.380	1.000	25.00	2.40	●
0.390	1.000	25.00	3.00	●
0.400	1.000	25.00	3.00	●

external cooling ☒

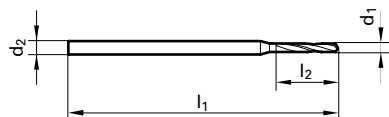
# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	138
<b>Guhring no.</b>	<b>303</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- left-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> 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	○
0.430	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	●
0.465	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	●
0.510	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	○
0.545	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	●
0.565	1.000	25.00	3.90	○
0.570	1.000	25.00	3.90	●
0.580	1.000	25.00	3.90	●
0.590	1.000	25.00	3.90	●
0.600	1.000	25.00	3.90	●
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	●
0.655	1.000	25.00	4.20	○
0.660	1.000	25.00	4.20	●
0.670	1.000	25.00	4.20	●
0.675	1.000	25.00	4.80	○
0.680	1.000	25.00	4.80	○

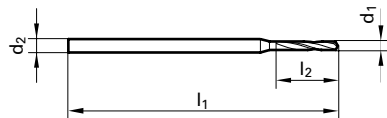
external cooling

# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	138
<b>Guhring no.</b>	<b>303</b>
DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- left-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
0.685	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	●
0.710	1.000	25.00	4.80	●
0.720	1.000	25.00	4.80	●
0.725	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	●
0.760	1.000	25.00	5.30	○
0.770	1.000	25.00	5.30	○
0.775	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	●
0.805	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	●
0.855	1.500	25.00	6.00	○
0.860	1.500	25.00	6.00	○
0.870	1.500	25.00	6.00	●
0.875	1.500	25.00	6.00	○
0.880	1.500	25.00	6.00	●
0.885	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	○
0.915	1.500	25.00	6.00	○
0.920	1.500	25.00	6.00	○
0.925	1.500	25.00	6.00	○
0.930	1.500	25.00	6.00	●
0.935	1.500	25.00	6.00	○
0.940	1.500	25.00	6.00	○
0.945	1.500	25.00	6.00	○
0.950	1.500	25.00	6.00	○
0.960	1.500	25.00	6.80	●
0.965	1.500	25.00	6.80	○
0.970	1.500	25.00	6.80	●

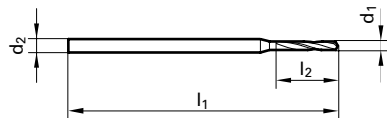
external cooling

# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	138
<b>Guhring no.</b>	<b>303</b>
DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- left-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
0.975	1.500	25.00	6.80	●
0.980	1.500	25.00	6.80	●
0.985	1.500	25.00	6.80	○
0.990	1.500	25.00	6.80	○
0.995	1.500	25.00	6.80	●
1.000	1.500	25.00	6.80	●
1.005	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	●
1.035	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	●
1.085	1.500	25.00	7.60	○
1.090	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	○
1.125	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	●
1.250	1.500	25.00	8.50	○
1.270	1.500	25.00	8.50	○
1.280	1.500	25.00	8.50	●
1.285	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	○
1.320	1.500	25.00	8.50	○
1.330	1.500	25.00	9.50	○
1.350	1.500	25.00	9.50	○
1.360	1.500	25.00	9.50	○
1.375	1.500	25.00	9.50	○

external cooling

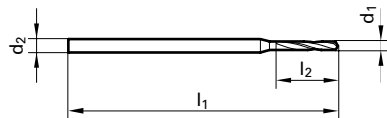
# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	138
<b>Guhring no.</b>	<b>303</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- left-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank
- < Ø 0.16 mm HSS-E



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
1.400	1.500	25.00	9.50	●
1.405	1.500	25.00	9.50	○
1.425	1.500	25.00	9.50	○
1.450	1.500	25.00	9.50	●
1.460	2.000	30.00	9.50	○
1.500	2.000	30.00	9.50	●
1.525	2.000	30.00	10.60	○
1.600	2.000	30.00	10.60	○
1.615	2.000	30.00	10.60	○
1.800	2.000	30.00	11.80	○
1.850	2.000	30.00	11.80	○

external cooling



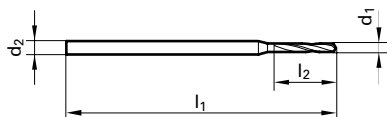
# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	TiN
Cooling	<input checked="" type="checkbox"/>
Discount group	135
<b>Guhring no.</b>	<b>660</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
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	●
0.210	1.000	25.00	1.50	●
0.220	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	●
0.290	1.000	25.00	1.90	●
0.295	1.000	25.00	1.90	○
0.300	1.000	25.00	1.90	●
0.305	1.000	25.00	2.40	●
0.310	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	●
0.350	1.000	25.00	2.40	●
0.360	1.000	25.00	2.40	●
0.370	1.000	25.00	2.40	●
0.380	1.000	25.00	2.40	●
0.390	1.000	25.00	3.00	●
0.400	1.000	25.00	3.00	●
0.410	1.000	25.00	3.00	●
0.420	1.000	25.00	3.00	●
0.430	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	●

external cooling

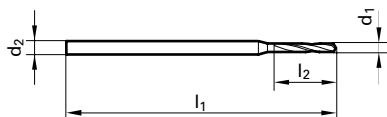
# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	TiN
Cooling	☒
Discount group	135
<b>Guhring no.</b>	<b>660</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
0.490	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	●
0.520	1.000	25.00	3.40	●
0.530	1.000	25.00	3.40	●
0.540	1.000	25.00	3.90	●
0.550	1.000	25.00	3.90	●
0.560	1.000	25.00	3.90	●
0.570	1.000	25.00	3.90	●
0.580	1.000	25.00	3.90	●
0.590	1.000	25.00	3.90	●
0.600	1.000	25.00	3.90	●
0.610	1.000	25.00	4.20	●
0.620	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	●
0.670	1.000	25.00	4.20	●
0.680	1.000	25.00	4.80	●
0.690	1.000	25.00	4.80	●
0.700	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	●
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	●
0.900	1.500	25.00	6.00	●

external cooling ☒

# Micro-precision drills ~5 x D without internal cooling

Tool material	<b>HSS-E-PM</b>
Surface finish	TiN
Cooling	☒
Discount group	135
<b>Guhring no.</b>	<b>660</b>

DIN	<b>DIN 1899</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

### Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 118° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
0.910	1.500	25.00	6.00	●
0.920	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	●
1.000	1.500	25.00	6.80	●
1.020	1.500	25.00	6.80	●
1.040	1.500	25.00	6.80	●
1.050	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	●
1.150	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	●
1.220	1.500	25.00	8.50	●
1.250	1.500	25.00	8.50	●
1.300	1.500	25.00	8.50	●
1.350	1.500	25.00	9.50	●
1.390	1.500	25.00	9.50	○
1.400	1.500	25.00	9.50	●
1.420	1.500	25.00	9.50	●
1.450	1.500	25.00	9.50	●
1.500	2.000	30.00	9.50	●
1.800	2.000	30.00	11.80	●
1.900	2.000	30.00	11.80	●

☒ external cooling

# Solid carbide micro-precision drills ~5 x D without internal cooling

Tool material	<b>Solid carbide</b>
Surface finish	bright
Cooling	<input checked="" type="checkbox"/>
Discount group	102
<b>Guhring no.</b>	<b>701</b>

DIN	<b>Guhring std.</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h8</b>
Type	<b>N</b>

## Product information

- drilling depth ~ 5xD
- right-hand cutting
- facet point grind
- 130° point angle
- Ø tolerance 0/-0.004 mm
- re-inforced shank



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
0.200	1.000	25.00	1.50	●
0.220	1.000	25.00	1.50	●
0.250	1.000	25.00	1.90	●
0.260	1.000	25.00	1.90	●
0.280	1.000	25.00	1.90	●
0.300	1.000	25.00	1.90	●
0.330	1.000	25.00	2.40	●
0.350	1.000	25.00	2.40	●
0.400	1.000	25.00	3.00	●
0.450	1.000	25.00	3.00	●
0.500	1.000	25.00	3.40	●
0.600	1.000	25.00	3.90	●
0.650	1.000	25.00	4.20	●
0.700	1.000	25.00	4.80	●
0.750	1.000	25.00	4.80	●
0.800	1.500	25.00	5.30	●
0.810	1.500	25.00	5.30	●
0.830	1.500	25.00	5.30	●
0.850	1.500	25.00	5.30	●
0.900	1.500	25.00	6.00	●
1.000	1.500	25.00	6.80	●
1.050	1.500	25.00	6.80	●
1.100	1.500	25.00	7.60	●
1.150	1.500	25.00	7.60	●
1.200	1.500	25.00	8.50	●
1.250	1.500	25.00	8.50	●
1.300	1.500	25.00	8.50	●
1.350	1.500	25.00	9.50	●
1.400	1.500	25.00	9.50	●

external cooling

# Solid carbide micro-precision drills without internal cooling

Tool material	<b>Solid carbide</b>
Surface finish	TiAIN
Cooling	<input checked="" type="checkbox"/>
Discount group	102
<b>Guhring no.</b>	<b>3899</b>

DIN	<b>Guhring std.</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h6</b>
Type	<b>N</b>

## Product information

- right-hand cutting
- facet point grind
- 140° point angle
- Ø tolerance = 1.0 h7
- re-inforced shank



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
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	○

external cooling

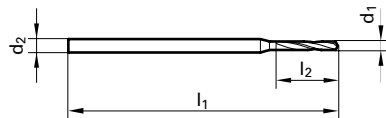
# Solid carbide micro-precision drills without internal cooling

Tool material	<b>Solid carbide</b>
Surface finish	TiAIN
Cooling	<input checked="" type="checkbox"/>
Discount group	102
<b>Guhring no.</b>	<b>3899</b>

DIN	<b>Guhring std.</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h6</b>
Type	<b>N</b>

## Product information

- right-hand cutting
- facet point grind
- 140° point angle
- Ø tolerance = 1.0 h7
- re-inforced shank



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
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	●
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	●

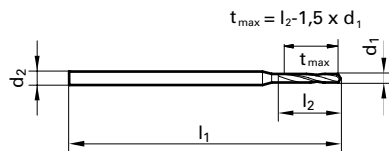
external cooling

# Solid carbide micro-precision drills ExclusiveLine 4 x D without int. cooling

Tool material	Solid carbide	
Surface finish	SuperA	
Cooling	☒	
Discount group	164	
<b>Guhring no.</b>	<b>6400</b>	
DIN	<b>Guhring std.</b>	
Shank design	<b>re-inforced</b>	
Shank tolerance	<b>h6</b>	
Type	<b>N</b>	

## Product information

- drilling depth ~4 x D
- right-hand cutting
- 2-facet point grind
- 140° point angle
- special flute form
- Ø tolerance m7
- pilot drill for 6412



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
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	●

☒ external cooling



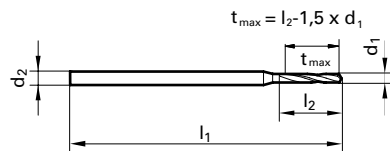


# Solid carbide micro-precision drills ExclusiveLine 7 x D without int. cooling

Tool material	<b>Solid carbide</b>
Surface finish	SuperA
Cooling	<input checked="" type="checkbox"/>
Discount group	164
<b>Guhring no.</b>	<b>6401</b>
DIN	<b>Guhring std.</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h6</b>
Type	<b>N</b>

## Product information

- drilling depth ~7 x D
- right-hand cutting
- 2-facet point grind
- 140° point angle
- special flute form
- Ø tolerance m7



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
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	●

external cooling



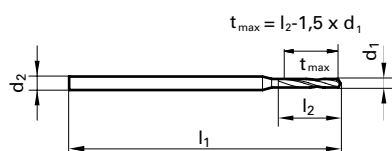
# Solid carbide micro-precision drills ExclusiveLine 5 x D with int. cooling

Tool material	Solid carbide
Surface finish	TiAIN
Cooling	■
Discount group	164
<b>Guhring no.</b>	<b>6405</b>

DIN	<b>Guhring std.</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h6</b>
Type	<b>N</b>

### Product information

- drilling depth ~5 x D
- right-hand cutting
- 2-facet point grind
- 140° point angle
- special flute form
- Ø tolerance m7
- pilot drill for 6412



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
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	●

■ internal cooling

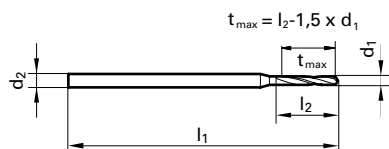
# Solid carbide micro-precision drills ExclusiveLine 8 x D with int. cooling

Tool material	<b>Solid carbide</b>
Surface finish	TiAIN
Cooling	■
Discount group	164
<b>Guhring no.</b>	<b>6408</b>

DIN	<b>Guhring std.</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h6</b>
Type	<b>N</b>

### Product information

- drilling depth ~8 x D
- right-hand cutting
- 2-facet point grind
- 135° point angle
- special flute form
- Ø tolerance h7



d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
1.400	4.000	52.00	15.00	●
1.450	4.000	52.00	16.00	●
1.500	4.000	52.00	17.00	●
1.550	4.000	52.00	17.00	●
1.590	4.000	52.00	18.00	●
1.600	4.000	52.00	18.00	●
1.650	4.000	52.00	18.00	●
1.700	4.000	56.00	19.00	●
1.750	4.000	56.00	19.00	●
1.800	4.000	56.00	20.00	●
1.850	4.000	56.00	20.00	●
1.900	4.000	56.00	21.00	●
1.950	4.000	56.00	21.00	●
1.980	4.000	56.00	22.00	●
2.000	4.000	56.00	22.00	●
2.050	4.000	56.00	23.00	●
2.100	4.000	62.00	23.00	●
2.150	4.000	62.00	24.00	●
2.200	4.000	62.00	24.00	●
2.250	4.000	62.00	25.00	●
2.300	4.000	62.00	25.00	●
2.350	4.000	62.00	26.00	●
2.380	4.000	62.00	26.00	●
2.400	4.000	62.00	26.00	●
2.450	4.000	62.00	27.00	●
2.500	4.000	62.00	28.00	●
2.550	4.000	62.00	28.00	●
2.600	4.000	66.00	29.00	●
2.650	4.000	66.00	29.00	●
2.700	4.000	66.00	30.00	●
2.750	4.000	66.00	30.00	●
2.780	4.000	66.00	31.00	●
2.800	4.000	66.00	31.00	●
2.850	4.000	66.00	31.00	●
2.900	4.000	66.00	32.00	●
2.950	4.000	66.00	32.00	●
3.000	4.000	66.00	33.00	●

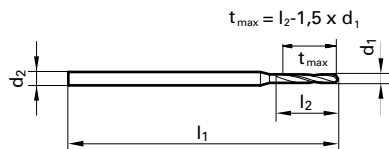
# Solid carbide micro-precision drills ExclusiveLine 15 x D with int. cooling

Tool material	Solid carbide
Surface finish	TiAIN
Cooling	■
Discount group	164
<b>Guhring no.</b>	<b>6412</b>

DIN	<b>Guhring std.</b>
Shank design	<b>re-inforced</b>
Shank tolerance	<b>h6</b>
Type	<b>N</b>

### Product information

- drilling depth ~15 x D
- right-hand cutting
- head tipped
- 2-facet point grind
- 135° point angle
- special flute form
- Ø tolerance h7
- please apply 6400 or 6405 as pilot drill



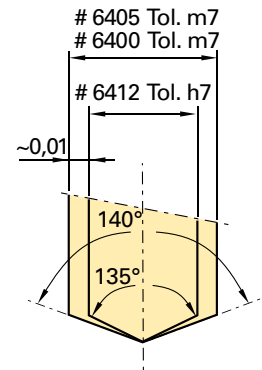
d <sub>1</sub> mm	d <sub>2</sub> mm	l <sub>1</sub> mm	l <sub>2</sub> mm	Availability
1.400	4.000	62.00	25.00	●
1.500	4.000	62.00	27.00	●
1.590	4.000	62.00	29.00	●
1.600	4.000	62.00	29.00	●
1.700	4.000	70.00	31.00	●
1.800	4.000	70.00	32.00	●
1.900	4.000	70.00	34.00	●
1.980	4.000	70.00	36.00	●
2.000	4.000	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	●
2.380	4.000	78.00	44.00	●
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	●
2.780	4.000	87.00	50.00	●
2.800	4.000	87.00	50.00	●
2.900	4.000	87.00	52.00	●
3.000	4.000	87.00	54.00	●

# Application recommendations

## Pilot drilling

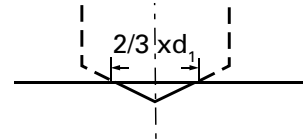
For the application of solid carbide micro-precision drills 15xD we recommend a pilot hole 1xD up to 2xD depth.

For this pilot hole, the solid carbide micro-precision drill 4xD without internal cooling and 5xD with internal cooling are optimally suitable, the solid carbide micro-precision drill 5xD with internal cooling especially for stainless steels and special alloys. Their point angle and their diameter tolerance are perfectly adapted.



## Centering

In order to achieve full performance with solid carbide micro-precision drills from 8xD drilling depth, we recommend centering. The ExclusiveLine solid carbide micro-precision drill up to 4xD, Guhring no. 6400, can be applied for this purpose. The centering diameter should be approximately  $\frac{2}{3}xD$ .



## 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, for example with our check instrument CC 3000.



## Tool clamping

For the clamping of the solid carbide micro-precision drills we recommend our HMC 3000 hydraulic chucks. They permit the direct clamping of tools with shank diameters from 3 mm. Advantages are the fast, easy and precise length adjustment and the perfect concentricity  $R < 3 \mu\text{m}$  at drilling depth 10xD.



# HMC 3000 SOLID CARBIDE DRILLS

## PERFECT CLAMPING

HMC 3000 hydraulic chucks  
together with solid carbide  
micro-precision drills





- ⇒ direct hydraulic clamping of shanks from  $\text{Ø } 3 \text{ mm}$
- ⇒ quick, simple and accurate length setting
- ⇒ perfect concentricity  $R < 3 \text{ }\mu\text{m}$  with  $10 \times d1$

# Micro-precision drills

Tools with bold feed column no. are preferred choice.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the GuhringNavigator on the internet: [www.guehring.de](http://www.guehring.de).

Guhring no. 

Guhring no. 

Standard/DIN

Tool material

Carbide grade

Surface finish

Type

Cooling

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

Coolant:

- Air
- Neat oil
- Soluble oil

Cutting direction:

- right-hand cutting
- left-hand cutting

Drill Ø mm	Feed column no. for Guhring no. 6400/6401/6408/6412												
	56	57	58	59	60	61	62	63	64	65	66	67	68
	f (mm/rev.)												
<b>0.50</b>	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
<b>0.80</b>	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
<b>1.00</b>	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
<b>1.50</b>	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
<b>2.00</b>	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
<b>2.50</b>	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
<b>3.00</b>	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

Material group	Material examples, new description (old description in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm <sup>2</sup> )	Hardness	Coolant
Common structural steels	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 ≤1000		<input type="radio"/>
Free-cutting steels	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 ≤1000		<input type="radio"/>
Unalloyed heat-treatable steels	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤700 ≤850 ≤1000		<input type="radio"/>
Alloyed heat-treatable steels	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1000 ≤1400		<input type="radio"/>
Unalloyed case hardened steels	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		<input type="radio"/>
Alloyed case hardened steels	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6 <b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1000 ≤1400		<input checked="" type="radio"/>
Nitriding steels	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1000 ≤1400		<input checked="" type="radio"/>
Tool steels	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 ≤1400		<input checked="" type="radio"/>
High speed steels	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		<input checked="" type="radio"/>
Spring steels	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	<input checked="" type="radio"/>
Stainless steels, sulphured	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		<input checked="" type="radio"/>
austenitic	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		<input checked="" type="radio"/>
martensitic	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		<input checked="" type="radio"/>
Hardened steels	-		≤48 HRC ≤66 HRC	<input checked="" type="radio"/>
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		<input checked="" type="radio"/>
Cast iron	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20) <b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤240 HB ≤350 HB	<input type="radio"/>
Spheroidal graphite iron and malleable cast iron	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35) <b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	<input type="radio"/>
Chilled cast iron	-		≤350 HB	<input type="radio"/>
Ti and Ti-alloys	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		<input checked="" type="radio"/>
Aluminium and Al-alloys	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		<input type="radio"/>
Al wrought alloys	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		<input type="radio"/>
Al cast alloys ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		<input type="radio"/>
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input type="radio"/>
Magnesium alloys	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		<input type="radio"/>
Copper, low-alloyed	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5Zn2Pb	≤500		<input type="radio"/>
Brass, short-chipping	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		<input type="radio"/>
long-chipping	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		<input type="radio"/>
Bronze, short-chipping	<b>2.1090</b> CuSn7Zn2Pb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn <b>2.0790</b> CuNi18Zn19Pb	≤600 ≤850		<input checked="" type="radio"/>
Bronze, long-chipping	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤850 ≤1000		<input checked="" type="radio"/>
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		<input type="radio"/>
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		<input type="radio"/>
New cast materials GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB ≤300 HB	<input type="radio"/>
New cast materials ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1000 ≤1400		<input type="radio"/>
Kevlar	Kevlar	≤1000		<input type="radio"/>
Glass, carbon concentrated plastics	GFK/CFK	≤1000		<input type="radio"/>





# Clamping chucks

## for micro-precision drills and micro-tools with shank-Ø < 6 mm

Guhring suitable clamping chucks for the optimal holding and clamping of micro-precision tools that guarantee high clamping force, perfect concentricity as well as easy handling.

### HSK-A hydraulic chucks HMC 3000 for clamping small diameters

**GÜHROJET**

Guh. no. 4618

#### Product information

- perfect concentricity: < 3 µm at 10xd<sub>1</sub>
- balancing quality: G6,3 / 30.000 U/min
- HSK-A to DIN 69893
- IC and GÜHROJET peripheral cooling ensure optimal chip evacuation and tool lubrication

#### Scope of delivery

- incl. length adjustment screw
- incl. hexagon chuck key Guhring no. 4912
- order coolant delivery set Guhring no. 4949 separately

Available for tool shank diameters 3 mm, 4 mm, 5 mm to HSK-A 32, HSK-A 40, HSK-A 50, HSK-A 63 or HSK-A100.



### ISO taper hydraulic chucks HMC 3000 for clamping small diameters

**GÜHROJET**

Guh. no. 4619

#### Product information

- perfect concentricity: < 3 µm at 10xd<sub>1</sub>
- balancing quality: G6,3 / 30.000 U/min
- ISO taper to DIN 69871 Form AD/B
- IC and GÜHROJET peripheral cooling ensure optimal chip evacuation and tool lubrication

#### Scope of delivery

- incl. length adjustment screw
- incl. hexagon chuck key Guhring no. 4912
- order pull studs Guhring no. 4925, 4926 separately



### MAS/BT hydraulic chucks HMC 3000 for clamping small diameters

**GÜHROJET**

Guh. no. 4620

#### Product information

- perfect concentricity: < 3 µm at 10xd<sub>1</sub>
- balancing quality: G6,3 / 30.000 U/min
- MAS/BT to JIS B 6339-2 form JD/JF (\*: version JD without coolant supply over collar)
- IC and GÜHROJET peripheral cooling ensure optimal chip evacuation and tool lubrication

#### Scope of delivery

- incl. length adjustment screw
- incl. hexagon chuck key Guhring no. 4912
- order pull studs Guhring no. 4927, 4928 separately



Guhring also provides mini drill chucks with HSK25, HSK32 and HSK40 to DIN 69893 or straight shank for tool shank diameters from 0.2 mm to 3.00 mm as a special solution.

### AMC with HSK holders to DIN 69893 or straight shank

Special tool

#### Product information

- HSK-A or HSK-E to DIN 69893
- perfect concentricity: 10 µm
- clamping range: 0.2 - 1.5 mm or 1.5 - 3.0 mm










Further information regarding our products can be found in our range of brochures. Please contact us!

# Additional tools for micro-precision machining

## Micro-fluteless taps and thread milling cutters

Guhring also provides micro-fluteless taps and thread milling cutters for the easy and process reliable production of threads from M1 as standard tools. Advantages:

- versatile application from universal machining up to high-tensile materials up to HRC 65
- highly accurate, perfectly machined threads

Standard	Type	Form	Ø tolerance	Tool illustration	Tool material	Surface finish	d1	Guh. no.
Micro-fluteless taps for ISO metric threads								
DIN 2174	N	C	6HX		HSS-E	Ⓢ	M1 - M1,8	921
JIS B 4430	N	C	RH4		HSS-E	○	M1 - M1,8	1016
JIS B 4430	N	C	RH4		HSS-E	Ⓢ	M1 - M1,8	1017
Micro-thread milling cutters								
Guhring std.	SP M			 3 x D	Solid carbide	Ⓒ	M1,6 - M12	4226
Guhring std.	SP G			 3 x D	Solid carbide	Ⓒ	G1/16' - G2'	4228
Guhring std.	SP M/MF			 3 x D	Solid carbide	Ⓒ	M1,4 - M10	4226
Micro-thread milling cutters for hard machining (45 HRC – 65 HRC)								
Guhring std.	SP M			 3 x D	Solid carbide	Ⓐ	M2 - M12	4227

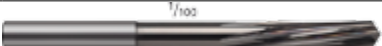


## Mini-slot drills

Guhring provides mini-slot drills in the standard range from diameter 0.3 mm

Standard	Type	Shank design	Tool illustration	Tool material	Surface finish	d1	Guh. no.
Mini-slot drills (2-fluted)							
DIN 6527 L	N	HA		Solid carbide	Ⓕ	from 1,000	3635
Mini-slot drills (3-fluted)							
Guhring std.	N	Ø<2,0 HA/HB		Solid carbide	Ⓕ	from 0,300	3684

## Reamers for smallest holes

Guhring also provides solid carbide and HSS-E reamers for reaming operations in the smallest holes from diameter 0.98 mm in the standard range.

Standard	Form	Tool illustration	Tool material	Surface finish	d1	Guh. no.
NC machine reamers						
Guhring std.	B	 1/100	Solid carbide	○	from 0,980	1427
DIN 212-3	B	 1/100	HSS-E	○	from 1,000	455
DIN 212-3	B		HSS-E	○	from 1,000	490

Further information regarding our products can be found in our range of brochures. Please contact us!

DRILLING

TAPPING/THREAD MILLING/  
FLUTELESS TAPPING

MILLING

REAMING

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SPECIAL TOOLING  
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DE-BURRING

MODULAR TOOLING  
SYSTEMS

TOOL RESTORATION SERVICE

# GUHRING

## Guhring KG

P.O. Box 100247 • D-72423 Albstadt  
Herderstrasse 50-54 • D-72458 Albstadt

Tel.: +49 74 31 17-0  
Fax: +49 74 31 17-21 279

info@guehring.de  
www.guehring.de

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