GUHRING
The Tool Company

NEW Larger Diameter Range

For extreme process reliability
From hole diameter 11 to 40.0 mm (0.433 - 1.575 in.)
For drilling depths 1.5xD, 3xD, 5xD, 7xD and 10xD
With interchangeable inserts for steel, stainless steel, cast iron and Al
Holders/interchangeable inserts for pilot drilling/countersinking

HT 800 WP

The interchangeable insert drilling system

HT 800 WP and power engineering

The ideal drilling system for the production of large, highly accurate holes in a variety of materials for wind and water power stations, engine plants or gas/steam turbines

With the new HT 800 WP interchangeable drilling system Guhring provides high-performance and cost-efficient holders for holes in diameters 11.00 to 40.0 mm (0.433 - 1.575 in.) These drills excel thanks to the following advantages:

A Extended tool life

Thanks to special, micro-machined cutting edges and the application oriented surface finish the interchangeable inserts of the HT 800 WP drilling system are especially wear resistant.

The holders of the HT 800 WP drilling system also possess a very high wear resistance. This is based on the optimized holder material with nickel plated surface as well as incremental holder sizes in steps of 0.5 mm up to diameter 31.99 mm and in steps of 1.0 mm above diameter 32.00 mm. This leads to less wear on the holder body.

B Optimized chip flow

Thanks to their flute cross section the holders of the HT 800 WP drilling system ensure optimal chip evacuation from the hole even with larger drilling depths.

C Perfect cooling lubrication

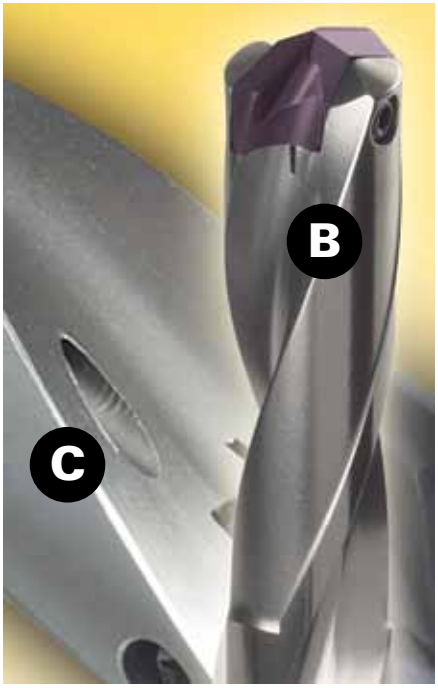
A perfect cooling lubrication is ensured by coolant ducts with maximum cross section, exiting in the flute. This enables an optimal cooling lubrication of the cutting edges and additionally supports chip evacuation from the hole.

D Highly accurate and rigid insert seat

The accurate insert seat enables the insert change in the machine in only a few, simple steps with a standard Torx screw driver. Thanks to the optimized material for the holders of the HT 800 WP drilling system, the insert can be changed more frequently than with conventional systems before the holder needs to be replaced due to wear of the insert seat. The clamping screws with screw lock ensure a secure holding of the interchangeable insert in the holder even with machines subject to high levels of vibrations.

Rigid holders

The close stepped diameter jumps with the holder sizes do more than simply reducing wear. Through the better guidance of the tool in the hole they also increase the rigidity of the HT 800 WP drilling system. Subsequently, resulting in longer tool life as well as improved workpiece surfaces.



HT 800 WP - Application Tips

Please observe the following notes and recommendations for the application of Guhring's HT 800 WP tools:

We recommend replacing the clamping screw when changing the insert.
Therefore, every holder is supplied with a clamping screw, Guhring no. 4071, and screwdriver, Guhring no. 1612. Every interchangeable insert is also supplied with a clamping screw, Guhring no. 4071.

When changing the insert please observe the following tightening torques for the clamping screw. Adhering to them is absolutely necessary for optimal machining results!

Diameter range (mm)	11.0 - 12.99	13.0 - 13.99	14.0 - 15.99	16.0 - 17.99	18.0 - 19.99	20.0 - 21.99	22.0 - 25.99	30.0 - 40.00
Thread	M2.2	M2.5	M3	M3.5	M4	M4.5	M5	M6
Torx size	T7	T8	T9	T10	T15	T15	T20	T25
Tightening torque [Nm]	**0.80**	**1.00**	**1.70**	**2.70**	**4.00**	**6.0**	**8.00**	**14.0**

Details apply to thread locking (Loctite)!

Examples of the HT800 WP extended tool life

Guhring no.	4107 + 4112	4109 + 4112	4109 + 4112	4107 + 4113	4108 + 4113
Diameter	17.5	17.5	17.5	17.5	14.1
Coating	nanoFIREX®	nanoFIREX®	nanoFIREX®	FIREX®	FIREX®
Material group	alloyed heat-treatable steel	alloyed heat-treatable steel	general structural steels	cast iron	cast iron
Material description	42CrMo4/ 1.7275	42CrMo4/ 1.7275	St52-3/ 1.0570	GG25/ 0.6025	GGG40/ 0.7040
Drill. depth [mm]	50	122.5	122.5	50	70
Hole type	blind hole	blind hole	blind hole	blind hole	blind hole
Cooling	IC 40 bar	IC 40 bar	IC 40 bar	IC 40 bar	IC 55 bar
Coolant	soluble oil	soluble oil	soluble oil	soluble oil	soluble oil
Machine type	machining center	machining center	machining center	machining center	machining center
v_c [m/min]	100	85	130	80	160
f_z [mm]	0.28	0.25	0.15	0.30	0.60
Tool life [m]	**50**	**30**	**35**	**250**	**120**

HT 800 WP Interchangeable Inserts

HT 800 WP interchangeable inserts are a synergy of tool material, geometry and coating perfectly adapted to your specific range of application. Subsequently, you will always achieve optimal machining results with maximum performance and highest economic efficiency. The insert change with HT 800 WP can be performed in the machine problem-free, the interchangeable insert always sits perfectly clamped and positioned in the holder.

Technical features and application recommendations

● optimal suitability
○ limited suitability

Application group	Material examples	Guhring no. 4112	4115	4113	4114	4111
	Tool material	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide
	Surface	nanoFIREX®	nanoA	FIREX®	bright	nanoA
	Point geometry	2-facet	relieved cone	2-facet	relieved cone	2-facet
	Point angle	140°	140°	140°	140°	145°
	Tolerance	h7	h7	m7	h7	m7
	Diameter	11.0 - 40.0	11.0 - 40.0	11.0 - 40.0	11.0 - 40.0	11.0 - 40.0
	Application	**steel**	**stainl. steel**	**cast iron**	**aluminium**	**pilot drilling**
						
P	steel, cast steel, stainless steel (ferritic and martensitic)	●	○	○		○
M	stainless steel and cast steel (austenitic and austenitic/ferritic)	○	●			○
K	grey cast iron, spheroidal graphite and malleable cast iron	○		●		○
N	aluminium and other non-ferrous metals				●	○
S	Special, Super- and Ti-alloys		○			○
H	Hardened steels and chilled cast iron		○			○

Complete compatibility

The new interchangeable inserts as well as the new holders of the HT 800 WP system are fully compatible with the conventional HT 800 WP interchangeable inserts and holders. You can, therefore, apply the new interchangeable inserts in the already existing HT 800 WP holders or combine new holders with existing interchangeable inserts. Drilling tests with both combination possibilities have shown that the efficiency of each package lies above the values of the old HT 800 WP system. You will definitely benefit!
The pilot insert 4111 can be combined with any holder, if the application requires a 145° point angle.

● optimal suitability
○ limited suitability

Application group	Material examples	Guhring no. 7645	7632	7635
	Tool material	solid carbide	solid carbide	solid carbide
	Surface	TiN	TiAlN	bright
	Type	CPGT ... R	CPGW ...	CPGT ... R
	Application	**steel**	**cast iron**	**aluminium**
				
P	steel, cast steel, stainless steel (ferritic and martensitic)	●	○	
M	stainless steel and cast steel (austenitic and austenitic/ferritic)	○		
K	grey cast iron, spheroidal graphite und malleable cast iron	○	●	
N	aluminium and other non-ferrous metals			●
S	Special, Super- and Ti-alloys	○		
H	Hardened steels and chilled cast iron	○		

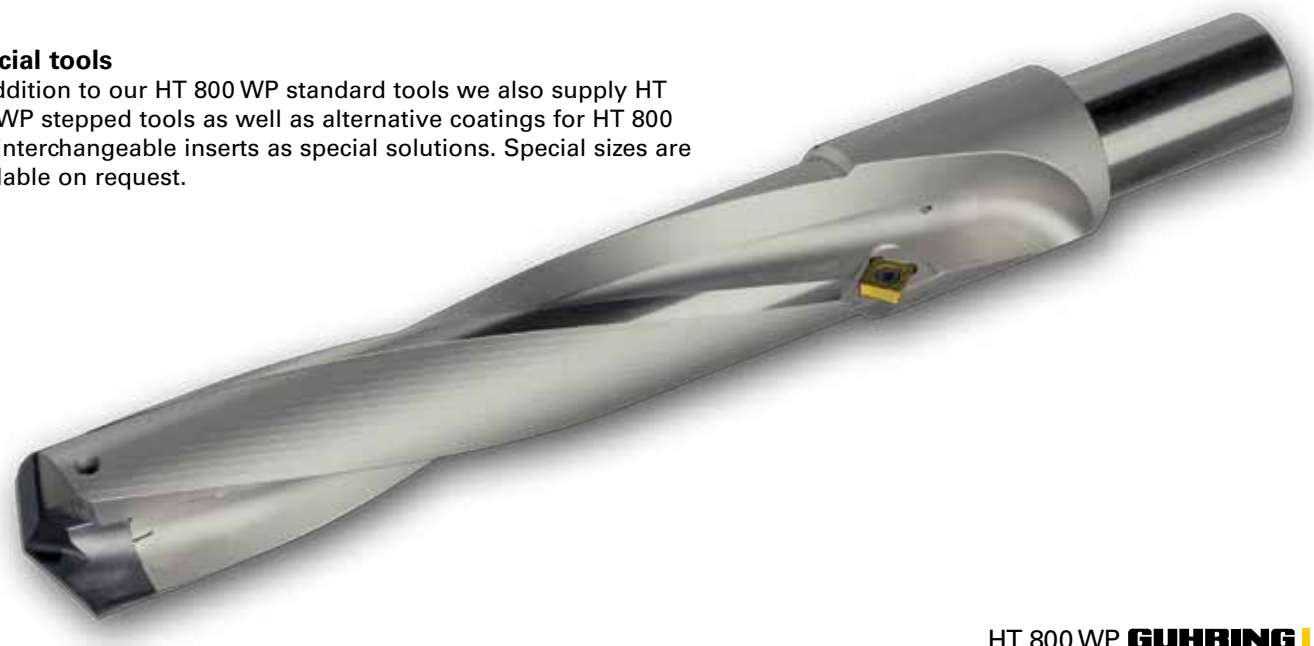
HT 800 WP Interchangeable Insert Holders

HT 800 WP holders offer highest accuracy and rigidity. The open flute together with internal cooling guarantees an optimal chip evacuation particularly from deeper holes. The reinforced shank to DIN 6535 HE ensures the strong and accurate clamping of the holder in the tool holder. As it meets the DIN standard for solid carbide monoblock tools, a problem-free changeover to the HT 800 WP system in production is possible at any time.

Guhring no.	4105	4106	4107	4108	4109	4110
Drilling depth	1 x D	1.5 x D	3 x D	5 x D	7 x D	10 x D
Diameter	11.0 - 40.00	11.0 - 40.00	11.0 - 40.00	11.0 - 40.00	11.0 - 31.99	11.0 - 31.99
Shank	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE
Page #	14	15 - 17	15 - 17	15 - 17	18 - 20	18 - 20
	45° pilot drilling/ countersinking					

Special tools

In addition to our HT 800 WP standard tools we also supply HT 800 WP stepped tools as well as alternative coatings for HT 800 WP interchangeable inserts as special solutions. Special sizes are available on request.



Carbide inserts with material-specific attributes

Four distinct geometries are available with the HT 800 WP drilling system, and they are completely interchangeable with any style drill body. The unique locating post and set screw design assures quick and accurate tool changes. The high performance insert designs allow for maximum penetration rates that far exceed conventional spade drills or dual insert drill designs.

① Choose your diameter (metric or inch)

② Choose the appropriate insert for your workpiece material

③ Note the holder size for that insert diameter; select a holder (1.5xD to 10xD) from the holder pages.

① Dia fract.	Dia mm	h mm	b mm	l4 mm	② Series 4115 nano-A EDP No.	Series 4114 bright EDP No.	Series 4113 FIREX® EDP No.	Series 4112 nano-FIREX® EDP No.	③ Drill Holder Size	Pilot Drill Holder Size
	11.00	7.5	4.5	2.1	9041150110000	9041140110000	9041130110000	9041120110000	110	110
	11.20				9041150112000	9041140112000	9041130112000	9041120112000		
	11.50			2.1	9041150115000	9041140115000	9041130115000	9041120115000		
29/64	11.51			2.1	9041150115100	9041140115100	9041130115100	9041120115100		
	11.70	7.5	4.5	2.1	9041150117000	9041140117000	9041130117000	9041120117000	115	110
	11.80			2.1	9041150118000	9041140118000	9041130118000	9041120118000		
15/32	11.91			2.2	9041150119100	9041140119100	9041130119100	9041120119100		
	12.00			2.2	9041150120000	9041140120000	9041130120000	9041120120000		
	12.10	7.7	5.0	2.2	9041150121000	9041140121000	9041130121000	9041120121000	120	120
	12.20			2.2	9041150122000	9041140122000	9041130122000	9041120122000		
31/64	12.30			2.2	9041150123000	9041140123000	9041130123000	9041120123000		
	12.50			2.3	9041150125000	9041140125000	9041130125000	9041120125000		
	12.60			2.3	9041150126000	9041140126000	9041130126000	9041120126000		
1/2	12.70	7.7	5.0	2.3	9041150127000	9041140127000	9041130127000	9041120127000	125	120
	12.80			2.3	9041150128000	9041140128000	9041130128000	9041120128000		
	12.90			2.3	9041150129000	9041140129000	9041130129000	9041120129000		
	13.00			2.4	9041150130000	9041140130000	9041130130000	9041120130000		
33/64	13.10	8.5	5.5	2.4	9041150131000	9041140131000	9041130131000	9041120131000	130	130
17/32	13.49			2.4	9041150134900	9041140134900	9041130134900	9041120134900		
	13.50			2.4	9041150135000	9041140135000	9041130135000	9041120135000		
	13.60			2.4	9041150136000	9041140136000	9041130136000	9041120136000		
	13.70	8.5	5.5	2.4	9041150137000	9041140137000	9041130137000	9041120137000	135	130
	13.80			2.5	9041150138000	9041140138000	9041130138000	9041120138000		
35/64	13.89			2.5	9041150138900	9041140138900	9041130138900	9041120138900		
	14.00			2.5	9041150140000	9041140140000	9041130140000	9041120140000		
	14.10	9.6	6.0	2.5	9041150141000	9041140141000	9041130141000	9041120141000	140	140
9/16	14.29			2.6	9041150142900	9041140142900	9041130142900	9041120142900		
	14.40			2.6	9041150144000	9041140144000	9041130144000	9041120144000		
	14.50			2.6	9041150145000	9041140145000	9041130145000	9041120145000		
	14.60			2.7	9041150146000	9041140146000	9041130146000	9041120146000		
37/64	14.68	9.6	6.0	2.7	9041150146800	9041140146800	9041130146800	9041120146800	145	140
	14.70			2.7	9041150147000	9041140147000	9041130147000	9041120147000		
	14.80			2.7	9041150148000	9041140148000	9041130148000	9041120148000		
	15.00			2.7	9041150150000	9041140150000	9041130150000	9041120150000		
19/32	15.08			2.7	9041150150800	9041140150800	9041130150800	9041120150800		
	15.10	9.8	6.0	2.7	9041150151000	9041140151000	9041130151000	9041120151000	150	140
	15.20			2.8	9041150152000	9041140152000	9041130152000	9041120152000		
	15.30			2.8	9041150153000	9041140153000	9041130153000	9041120153000		
39/64	15.48			2.8	9041150154800	9041140154800	9041130154800	9041120154800		
	15.50			2.8	9041150155000	9041140155000	9041130155000	9041120155000		
	15.60			2.9	9041150156000	9041140156000	9041130156000	9041120156000		
	15.70	9.8	6.0	2.9	9041150157000	9041140157000	9041130157000	9041120157000	155	140
	15.80			2.9	9041150158000	9041140158000	9041130158000	9041120158000		
5/8	15.87			2.9	9041150158700	9041140158700	9041130158700	9041120158700		
	16.00	11.0	7.0	2.9	9041150160000	9041140160000	9041130160000	9041120160000	160	160
41/64	16.27			3.0	9041150162700	9041140162700	9041130162700	9041120162700		

Inserts are always supplied with clamping screw, Guhring no. 4071.

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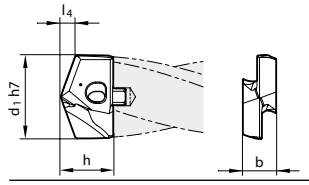
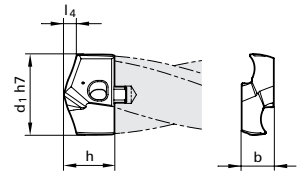
Application Materials:



Series 4115

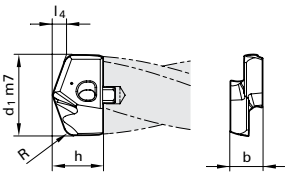
Stainless Steels



Series 4114

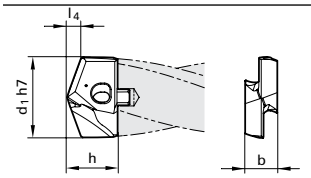
Aluminum & Aluminum Alloys

Application Materials:



Series 4113

Cast Iron



Series 4112

General Steels/ Brass

Universal Steels

Stainless Steels

Hardened Materials

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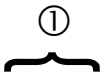
Dia fract.	Dia mm	h mm	b mm	l4 mm	Series 4115 nano-A EDP No.	Series 4114 bright EDP No.	Series 4113 FIREX® EDP No.	Series 4112 nano-FIREX® EDP No.	Drill Holder Size	Pilot Drill Holder Size
	16.50	11.0	7.0	3.0	9041150165000	9041140165000	9041130165000	9041120165000	165	160
21/32	16.67			3.0	9041150166700	9041140166700	9041130166700	9041120166700		
	17.00			3.1	9041150170000	9041140170000	9041130170000	9041120170000		
43/64	17.07	11.0	7.0	3.1	9041150170700	9041140170700	9041130170700	9041120170700	170	160
11/16	17.46			3.1	9041150174600	9041140174600	9041130174600	9041120174600		
	17.50			3.2	9041150175000	9041140175000	9041130175000	9041120175000		
	17.60	11.0	7.0	3.2	9041150176000	9041140176000	9041130176000	9041120176000	175	160
45/64	17.86			3.3	9041150178600	9041140178600	9041130178600	9041120178600		
	18.00	12.6	8.0	3.3	9041150180000	9041140180000	9041130180000	9041120180000	180	180
23/32	18.26			3.3	9041150182600	9041140182600	9041130182600	9041120182600		
	18.50	12.6	8.0	3.4	9041150185000	9041140185000	9041130185000	9041120185000	185	180
47/64	18.65			3.4	9041150186500	9041140186500	9041130186500	9041120186500		
	19.00			3.5	9041150190000	9041140190000	9041130190000	9041120190000		
3/4	19.05	12.6	8.0	3.5	9041150190500	9041140190500	9041130190500	9041120190500	190	180
49/64	19.45			3.5	9041150194500	9041140194500	9041130194500	9041120194500		
	19.50			3.5	9041150195000	9041140195000	9041130195000	9041120195000		
	19.60	12.6	8.0	3.6	9041150196000	9041140196000	9041130196000	9041120196000	195	180
25/32	19.84			3.6	9041150198400	9041140198400	9041130198400	9041120198400		
	20.00	13.9	9.0	3.6	9041150200000	9041140200000	9041130200000	9041120200000	200	200
51/64	20.24			3.6	9041150202400	9041140202400	9041130202400	9041120202400		
	20.50	13.9	9.0	3.7	9041150205000	9041140205000	9041130205000	9041120205000	205	200
13/16	20.64			3.8	9041150206400	9041140206400	9041130206400	9041120206400		
	21.00			3.8	9041150210000	9041140210000	9041130210000	9041120210000		
53/64	21.03	13.9	9.0	3.8	9041150210300	9041140210300	9041130210300	9041120210300	210	200
	21.10			3.9	9041150211000	9041140211000	9041130211000	9041120211000		
27/32	21.43			3.9	9041150214300	9041140214300	9041130214300	9041120214300		
	21.50	13.9	9.0	3.9	9041150215000	9041140215000	9041130215000	9041120215000	215	200
55/64	21.83			4.0	9041150218300	9041140218300	9041130218300	9041120218300		
	22.00	15.3	10.0	4.0	9041150220000	9041140220000	9041130220000	9041120220000	220	220
7/8	22.22			4.0	9041150222200	9041140222200	9041130222200	9041120222200		
	22.50	15.3	10.0	4.1	9041150225000	9041140225000	9041130225000	9041120225000	225	220
57/64	22.62			4.1	9041150226200	9041140226200	9041130226200	9041120226200		
	23.00			4.2	9041150230000	9041140230000	9041130230000	9041120230000		
29/32	23.02	15.3	10.0	4.2	9041150230200	9041140230200	9041130230200	9041120230200	230	220
59/64	23.42			4.3	9041150234200	9041140234200	9041130234200	9041120234200		
	23.50	15.3	10.0	4.3	9041150235000	9041140235000	9041130235000	9041120235000	235	220
15/16	23.81			4.3	9041150238100	9041140238100	9041130238100	9041120238100		
	24.00			4.4	9041150240000	9041140240000	9041130240000	9041120240000		
	24.10	15.8	11.0	4.4	9041150241000	9041140241000	9041130241000	9041120241000	240	240
61/64	24.21			4.4	9041150242100	9041140242100	9041130242100	9041120242100		
	24.50	15.8	11.0	4.5	9041150245000	9041140245000	9041130245000	9041120245000	245	240
31/32	24.61			4.5	9041150246100	9041140246100	9041130246100	9041120246100		
	25.00	15.8	11.0	4.5	9041150250000	9041140250000	9041130250000	9041120250000	250	240
1	25.40			4.6	9041150254000	9041140254000	9041130254000	9041120254000		
	25.50	15.8	11.0	4.6	9041150255000	9041140255000	9041130255000	9041120255000	255	240

Inserts are always supplied with clamping screw, Guhring no. 4071.

Carbide inserts with material-specific attributes



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Dia fract.	Dia mm	h mm	b mm	l4 mm	Series 4115 nano-A EDP No.	Series 4114 bright EDP No.	Series 4113 FIREX® EDP No.	Series 4112 nano-FIREX® EDP No.	Drill Holder Size	Pilot Drill Holder Size
	26.000	4.80	12.00	20.00	9041150260000	9041140260000	9041130260000	9041120260000	260	260
1 1/32	26.190	4.80	12.00	20.00	9041150261900	9041140261900	9041130261900	9041120261900		
	26.500	4.90	12.00	20.00	9041150265000	9041140265000	9041130265000	9041120265000	265	260
1 3/64	26.590	4.90	12.00	20.00	9041150265900	9041140265900	9041130265900	9041120265900		
	27.000	5.00	12.00	20.00	9041150270000	9041140270000	9041130270000	9041120270000	270	260
	27.500	5.10	12.00	20.00	9041150275000	9041140275000	9041130275000	9041120275000	275	260
	27.700	5.10	12.00	20.00	9041150277000	9041140277000	9041130277000	9041120277000		
1 3/32	27.780	5.10	12.00	20.00	9041150277800	9041140277800	9041130277800	9041120277800		
	28.000	5.10	13.00	20.70	9041150280000	9041140280000	9041130280000	9041120280000	280	280
1 7/64	28.180	5.20	13.00	20.70	9041150281800	9041140281800	9041130281800	9041120281800		
	28.500	5.20	13.00	20.70	9041150285000	9041140285000	9041130285000	9041120285000	285	280
1 1/8	28.580	5.30	13.00	20.70	9041150285800	9041140285800	9041130285800	9041120285800		
	29.000	5.30	13.00	20.70	9041150290000	9041140290000	9041130290000	9041120290000	290	280
1 5/32	29.370	5.40	13.00	20.70	9041150293700	9041140293700	9041130293700	9041120293700		
	29.500	5.40	13.00	20.70	9041150295000	9041140295000	9041130295000	9041120295000	295	280
	29.600	5.50	13.00	20.70	9041150296000			9041120296000		
1 11/64	29.770	5.50	14.00	22.30	9041150297700	9041140297700	9041130297700	9041120297700	300	300
	30.000	5.50	14.00	22.30	9041150300000	9041140300000	9041130300000	9041120300000		
1 3/16	30.160	5.60	14.00	22.30	9041150301600	9041140301600	9041130301600	9041120301600	305	300
	30.500	5.70	14.00	22.30	9041150305000	9041140305000	9041130305000	9041120305000		
1 7/32	30.960	5.70	14.00	22.30	9041150309600	9041140309600	9041130309600	9041120309600	310	300
	31.000	5.80	14.00	22.30	9041150310000	9041140310000	9041130310000	9041120310000	315	300
	31.500	5.80	14.00	22.30	9041150315000	9041140315000	9041130315000	9041120315000		
1 1/4	31.750	5.90	15.00	23.10	9041150317500	9041140317500	9041130317500	9041120317500	320	320
	32.000	6.00	15.00	23.10	9041150320000	9041140320000	9041130320000	9041120320000		
	32.500	6.00	15.00	23.10	9041150325000	9041140325000	9041130325000	9041120325000		
1 9/32	32.540	6.00	15.00	23.10	9041150325400	9041140325400	9041130325400	9041120325400		
1 19/64	32.940	6.10	15.00	23.10	9041150329400	9041140329400	9041130329400	9041120329400	330	320
	33.000	6.10	15.00	23.10	9041150330000	9041140330000	9041130330000	9041120330000		
1 5/16	33.340	6.10	15.00	23.10	9041150333400	9041140333400	9041130333400	9041120333400		
	33.500	6.20	15.00	23.10	9041150335000	9041140335000	9041130335000	9041120335000	340	320
	34.000	6.30	15.00	23.10	9041150340000	9041140340000	9041130340000	9041120340000		
1 11/32	34.130	6.30	15.00	23.10	9041150341300	9041140341300	9041130341300	9041120341300		
	34.500	6.40	15.00	23.10	9041150345000	9041140345000	9041130345000	9041120345000		
1 3/8	34.930	6.40	15.00	23.10	9041150349300	9041140349300	9041130349300	9041120349300	350	360
	35.000	6.50	15.00	23.10	9041150350000	9041140350000	9041130350000	9041120350000		
	35.500	6.60	15.00	23.10	9041150355000	9041140355000	9041130355000	9041120355000		
1 13/32	35.720	6.60	16.00	23.90	9041150357200	9041140357200	9041130357200	9041120357200	360	360
	36.000	6.70	16.00	23.90	9041150360000	9041140360000	9041130360000	9041120360000		
	36.500	6.70	16.00	23.90	9041150365000	9041140365000	9041130365000	9041120365000		
1 7/16	36.510	6.80	16.00	23.90	9041150365100	9041140365100	9041130365100	9041120365100	370	360
	37.000	6.80	16.00	23.90	9041150370000	9041140370000	9041130370000	9041120370000		
1 15/32	37.310	6.90	16.00	23.90	9041150373100	9041140373100	9041130373100	9041120373100		
	37.500	7.00	16.00	23.90	9041150375000	9041140375000	9041130375000	9041120375000	380	360
	38.000	7.00	16.00	23.90	9041150380000	9041140380000	9041130380000	9041120380000		
1 1/2	38.100	7.00	16.00	23.90	9041150381000	9041140381000	9041130381000	9041120381000		
1 33/64	38.500	7.10	16.00	23.90	9041150385000	9041140385000	9041130385000	9041120385000		
	39.000	7.10	16.00	23.90	9041150390000	9041140390000	9041130390000	9041120390000	390	360
	39.500	7.20	16.00	23.90	9041150395000	9041140395000	9041130395000	9041120395000		
	40.000	7.30	16.00	23.90	9041150400000	9041140400000	9041130400000	9041120400000		

Inserts are always supplied with clamping screw, Guhring no. 4071.

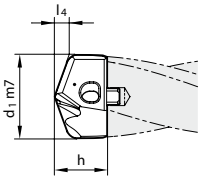
HT 800 WP Interchangeable Insert Drills

Drill inserts for pilot drilling - Series 4111

Carbide, nano-A™ coated

145° point angle, m7 tolerance on diameter

The Series 4105 is a pilot and chamfering tool specifically designed for pilot drilling 7xD and especially 10xD deep hole applications. The Series 4111 insert has a 145° point angle which is required for proper application of a pre-drill pilot operation. This pilot drilling insert is also interchangeable with all other HT 800 WP body series.



Series 4111

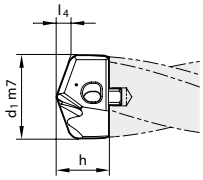
Dia fract.	Dia mm	h mm	b mm	l4 mm	Series 4111 nano-A insert EDP No.	Holder Size
	11.00	6.9	4.5	1.5	9041110110000	110
	11.20	6.9	4.5	1.5	9041110112000	
	11.50	6.9	4.5	1.5	9041110115000	115
29/64	**11.51**	6.9	4.5	1.5	9041110115100	
	11.70	6.9	4.5	1.6	9041110117000	
	11.80	6.9	4.5	1.6	9041110118000	
15/32	**11.91**	6.9	4.5	1.6	9041110119100	
	12.00	7.1	5.0	1.6	9041110120000	120
	12.10	7.1	5.0	1.6	9041110121000	
	12.20	7.1	5.0	1.6	9041110122000	
31/64	**12.30**	7.1	5.0	1.6	9041110123000	
	12.50	7.1	5.0	1.7	9041110125000	125
	12.60	7.1	5.0	1.7	9041110126000	
1/2	**12.70**	7.1	5.0	1.7	9041110127000	
	12.80	7.1	5.0	1.7	9041110128000	
	12.90	7.1	5.0	1.7	9041110129000	
	13.00	7.9	5.5	1.7	9041110130000	130
33/64	**13.10**	7.9	5.5	1.7	9041110131000	
17/32	**13.49**	7.9	5.5	1.8	9041110134900	
	13.50	7.9	5.5	1.8	9041110135000	135
	13.60	7.9	5.5	1.8	9041110136000	
	13.70	7.9	5.5	1.8	9041110137000	
	13.80	7.9	5.5	1.9	9041110138000	
35/64	**13.89**	7.9	5.5	1.9	9041110138900	
	14.00	9.1	6.0	1.9	9041110140000	140
	14.10	9.1	6.0	1.9	9041110141000	
9/16	**14.29**	9.1	6.0	1.9	9041110142900	
	14.40	9.1	6.0	1.9	9041110144000	
	14.50	9.1	6.0	1.9	9041110145000	145
	14.60	9.1	6.0	2.0	9041110146000	
37/64	**14.68**	9.1	6.0	2.0	9041110146800	
	14.70	9.1	6.0	2.0	9041110147000	
	14.80	9.1	6.0	2.0	9041110148000	
	15.00	9.1	6.0	2.0	9041110150000	150
19/32	**15.08**	9.1	6.0	2.0	9041110150800	
	15.10	9.1	6.0	2.0	9041110151000	
	15.20	9.1	6.0	2.0	9041110152000	
	15.30	9.1	6.0	2.1	9041110153000	
39/64	**15.48**	9.1	6.0	2.1	9041110154800	
	15.50	9.1	6.0	2.1	9041110155000	155
	15.60	9.1	6.0	2.1	9041110156000	
	15.70	9.1	6.0	2.1	9041110157000	
	15.80	9.1	6.0	2.1	9041110158000	
5/8	**15.87**	9.1	6.0	2.1	9041110158700	
	16.00	10.2	7.0	2.1	9041110160000	160
41/64	**16.27**	10.2	7.0	2.2	9041110162700	
	16.50	10.2	7.0	2.2	9041110165000	165
21/32	**16.67**	10.2	7.0	2.2	9041110166700	

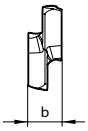
Dia fract.	Dia mm	h mm	b mm	l4 mm	Series 4111 nano-A insert EDP No.	Holder Size
	17.00	10.2	7.0	2.3	9041110170000	170
43/64	**17.07**	10.2	7.0	2.3	9041110170700	
11/16	**17.46**	10.2	7.0	2.3	9041110174600	
	17.50	10.2	7.0	2.3	9041110175000	175
	17.60	10.2	7.0	2.3	9041110176000	
45/64	**17.86**	10.2	7.0	2.4	9041110178600	
	18.00	11.7	8.0	2.4	9041110180000	180
23/32	**18.26**	11.7	8.0	2.4	9041110182600	
	18.50	11.7	8.0	2.5	9041110185000	185
47/64	**18.65**	11.7	8.0	2.5	9041110186500	
	19.00	11.7	8.0	2.5	9041110190000	190
3/4	**19.05**	11.7	8.0	2.5	9041110190500	
49/64	**19.45**	11.7	8.0	2.6	9041110194500	
	19.50	11.7	8.0	2.6	9041110195000	195
	19.60	11.7	8.0	2.6	9041110196000	
25/32	**19.84**	11.7	8.0	2.7	9041110198400	
	20.00	12.9	9.0	2.7	9041110200000	200
51/64	**20.24**	12.9	9.0	2.7	9041110202400	
	20.50	12.9	9.0	2.7	9041110205000	205
13/16	**20.64**	12.9	9.0	2.8	9041110206400	
	21.00	12.9	9.0	2.8	9041110210000	210
53/64	**21.03**	12.9	9.0	2.8	9041110210300	
	21.10	12.9	9.0	2.8	9041110211000	
27/32	**21.43**	12.9	9.0	2.9	9041110214300	
	21.50	12.9	9.0	2.9	9041110215000	215
55/64	**21.83**	12.9	9.0	2.9	9041110218300	
	22.00	14.3	10.0	3.0	9041110220000	220
7/8	**22.22**	14.3	10.0	3.0	9041110222200	
	22.50	14.3	10.0	3.0	9041110225000	225
57/64	**22.62**	14.3	10.0	3.0	9041110226200	
	23.00	14.3	10.0	3.1	9041110230000	230
29/32	**23.02**	14.3	10.0	3.1	9041110230200	
59/64	**23.42**	14.3	10.0	3.1	9041110234200	
	23.50	14.3	10.0	3.1	9041110235000	235
15/16	**23.81**	14.3	10.0	3.2	9041110238100	
	24.00	14.7	11.0	3.2	9041110240000	240
	24.10	14.7	11.0	3.2	9041110241000	
61/64	**24.21**	14.7	11.0	3.2	9041110242100	
	24.50	14.7	11.0	3.3	9041110245000	245
31/32	**24.61**	14.7	11.0	3.3	9041110246100	
	25.00	14.7	11.0	3.4	9041110250000	250
1	**25.40**	14.7	11.0	3.4	9041110254000	
	25.50	14.7	11.0	3.4	9041110255000	255
	26.00	4.10	12.00	19.40	9041110260000	260
1 1/32	26.19	4.10	12.00	19.40	9041110261900	
	26.50	4.10	12.00	19.40	9041110265000	265
1 3/64	26.59	4.20	12.00	19.40	9041110265900	
	27.00	4.20	12.00	19.40	9041110270000	270

Inserts are always supplied with clamping screw, Guhring no. 4071.

HT 800 WP Interchangeable Insert Drills

Dia fract.	Dia mm	h mm	b mm	l4 mm	Series 4111 nano-A insert EDP No.	Holder Size
	27.50	4.30	12.00	19.40	9041110275000	
	27.70	4.30	12.00	19.40	9041110277000	275
1 3/32	27.78	4.30	12.00	19.40	9041110277800	
	28.00	4.40	13.00	20.10	9041110280000	280
	28.18	4.40	13.00	20.10	9041110281800	
	28.50	4.50	13.00	20.10	9041110285000	285
	28.58	4.50	13.00	20.10	9041110285800	285
	29.00	4.60	13.00	20.10	9041110290000	290
1 5/32	29.37	4.60	13.00	20.10	9041110293700	
	29.50	4.60	13.00	20.10	9041110295000	295
	30.00	4.70	14.00	21.70	9041110300000	300
1 3/16	30.16	4.70	14.00	21.70	9041110301600	
	30.50	4.80	14.00	21.70	9041110305000	305
	30.96	4.80	14.00	21.70	9041110309600	
	31.00	4.90	14.00	21.70	9041110310000	310
	31.50	4.90	14.00	21.70	9041110315000	315
1 1/4	31.75	4.90	14.00	21.70	9041110317500	
	32.00	5.00	15.00	22.40	9041110320000	
	32.50	5.10	15.00	22.40	9041110325000	320
1 9/32	32.54	5.10	15.00	22.40	9041110325400	
	33.00	5.20	15.00	22.40	9041110330000	
1 5/16	33.34	5.20	15.00	22.40	9041110333400	330
	33.50	5.30	15.00	22.40	9041110335000	
	34.00	5.40	15.00	22.40	9041110340000	
1 11/32	34.13	5.40	15.00	22.40	9041110341300	340
	34.50	5.40	15.00	22.40	9041110345000	
	34.93	5.40	15.00	22.40	9041110349300	
	35.00	5.50	15.00	22.40	9041110350000	
	35.50	5.60	15.00	22.40	9041110355000	350
	35.72	5.60	15.00	22.40	9041110357200	
	36.00	5.70	16.00	23.20	9041110360000	
	36.50	5.70	16.00	23.20	9041110365000	360
	36.51	5.70	16.00	23.20	9041110365100	
	37.00	5.80	16.00	23.20	9041110370000	
1 15/32	37.31	5.80	16.00	23.20	9041110373100	370
	37.50	5.90	16.00	23.20	9041110375000	
	38.00	6.00	16.00	23.20	9041110380000	
1 1/2	38.10	6.00	16.00	23.20	9041110381000	380
1 33/64	38.50	6.10	16.00	23.20	9041110385000	
	39.00	6.20	16.00	23.20	9041110390000	
	39.50	6.20	16.00	23.20	9041110395000	390
	40.00	6.20	16.00	23.20	9041110400000	





Series 4111

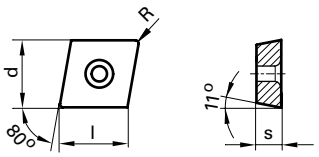
Inserts are always supplied with clamping screw, Guhring no. 4071.

Countersink inserts for pilot and countersink holes

Series 7645 for steels

Series 7632 for cast iron

Series 7635 for aluminum



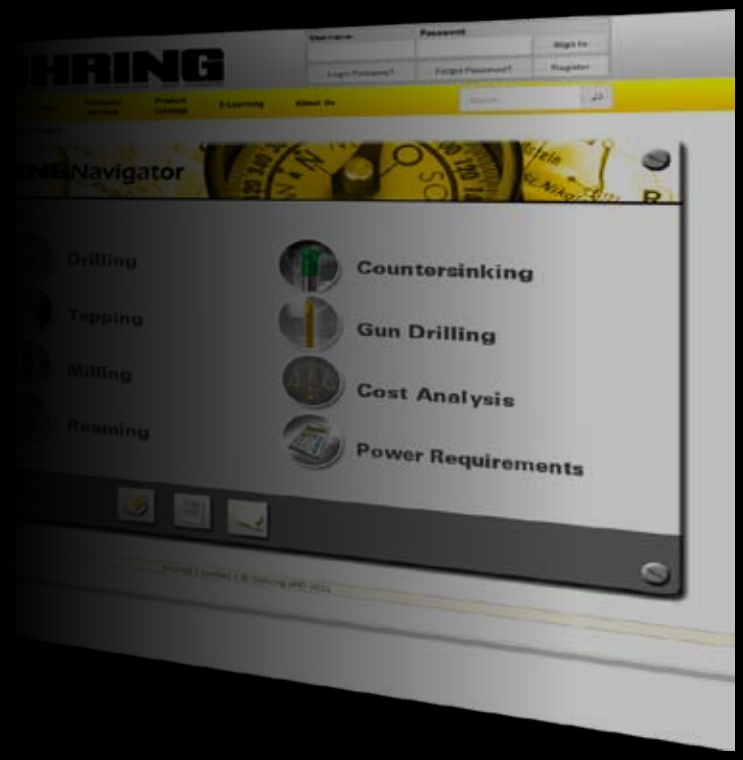
Type	d mm	s mm	R mm	l mm	Series 7645 TiN coated EDP No.	Series 7632 TiAlN coated EDP No.	Series 7635 Bright finish EDP No.	Drill Holder Size
CPGT050204R	**5.56**	2.38	0.4	5.64	9076450520400		9076350520400	110-140
CPGT060204R	**6.35**	2.38	0.4	6.45	9076450620400		9076350620400	160-240
CPGT09T308R	**9.53**	3.97	0.8	9.67	9076450930800		9076350930800	300-360
CPGW050204	**5.56**	2.38	0.4	5.60		9076320520400		110-140
CPGW060204	**6.35**	2.38	0.4	6.40		9076320620400		160-240
CPGT09T308	**9.53**	3.97	0.8	9.67		9076320930800		300-360

Guhring Navigator:

Guhring Navigator is a step by step program that allows you to find the perfect Guhring tool for your machining task.

Guhring Navigator allows you to specify the material you are cutting and tool features you desire. The ending search result displays the ideal tool(s), speeds and feeds as well as other key information.

Stop flipping through a catalog to find the right tool and let Guhring Navigator do the work for you!



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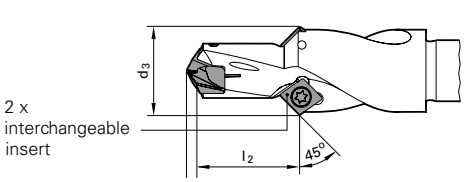
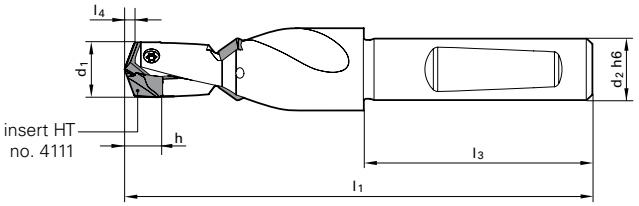
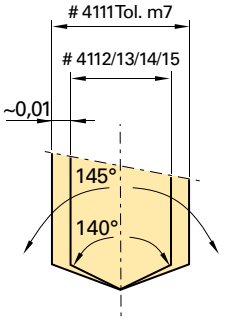
1 x D for Pilot Drilling and Countersinking

Holders for pilot drilling - Series 4105

HSS, coolant fed, nickel treated







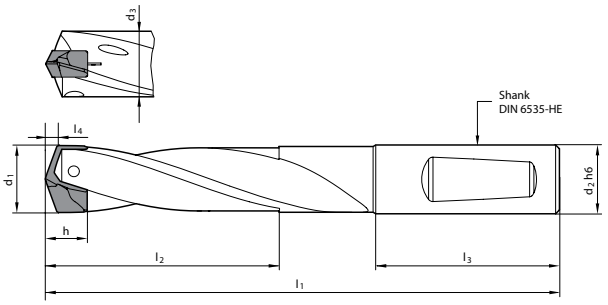
Pilot drilling example

Holder Size	EDP No.	d1 Insert Range mm	d2 mm	d2 in	d3 mm	Series 4105 Holder (1xD w/countersink) l1 mm	l2 mm	l3 mm
110	9041050110000	11.00-11.99	12.00	1/2	17.00	81.00	14.80	45.00
	9041050110050	11.00-11.99	12.70		17.00			
120	9041050120000	12.00-12.99	12.00	1/2	18.00	84.00	15.80	45.00
	9041050120050	12.00-12.99	12.70		18.00			
130	9041050130000	13.00-13.99	14.00	5/8	18.00	86.00	16.30	45.00
	9041050130050	13.00-13.99	15.875		18.00			
140	9041050140000	14.00-15.99	16.00	5/8	18.00	93.00	17.40	48.00
	9041050140050	14.00-15.99	15.875		18.00			
160	9041050160000	16.00-17.99	18.00	3/4	20.00	99.00	19.40	48.00
	9041050160050	16.00-17.99	19.05		20.00			
180	9041050180000	18.00-19.99	20.00	3/4	22.00	106.00	21.40	50.00
	9041050180050	18.00-19.99	19.05		22.00			
200	9041050200000	20.00-21.99	25.00	1.0"	24.00	117.00	23.40	56.00
	9041050200050	20.00-21.99	25.40		24.00			
220	9041050220000	22.00-23.99	25.00	1.0"	26.00	122.00	25.40	56.00
	9041050220050	22.00-23.99	25.40		26.00			
240	9041050240000	24.00-25.99	25.00	1.0"	28.00	128.00	27.40	56.00
	9041050240050	24.00-25.99	25.40		28.00			
260	9041050260000	26.00 - 27.99	32.00		32.00	142.00	28.00	60.00
	9041050260050	26.00 - 27.99	31.75		32.00			
280	9041050280000	28.00 - 29.99	32.00		34.00	147.00	30.00	60.00
	9041050280050	28.00 - 29.99	31.75		34.00			
300	9041050300000	30.00 - 31.99	32.00		38.00	152.00	32.00	60.00
	9041050300050	30.00 - 31.99	31.75		38.00			
320	9041050320000	32.00 - 35.99	32.00		42.00	163.00	36.00	60.00
	9041050320050	32.00 - 35.99	31.75		42.00			
360	9041050360000	36.00 - 40.00	32.00		46.00	173.00	40.00	60.00
	9041050360050	36.00 - 40.00	31.75		46.00			

Holders are always supplied with clamping screw, Guhring no. 4071, and screwdriver, Guhring no. 1612.

Holders for drilling - Series 4106 (1.5xD), 4107 (3xD) and 4108 (5xD)

HSS, coolant fed, nickel treated



③ **l1 dimensions listed include insert series 4112, 4113, 4114, and 4115 only. Pilot insert series 4111 has different h and l4 dimensions*

Holder Size	d1 Insert Range mm	d2 mm	d2 in	d3 mm	l3 mm	Series 4106 (1.5xD) EDP No.	l1* mm	l2 mm	Series 4107 (3xD) EDP No.	l1* mm	l2 mm	Series 4108 (5xD) EDP No.	l1* mm	l2 mm
110	11.00-11.49	12.00		10.70	45.00	9041060110000	84.00	19.30	9041070110000	101.00	36.60	9041080110000	124.00	59.60
110	11.00-11.49	12.70	1/2	10.70		9041060110050			9041070110050			9041080110050		
115	11.50-11.99	12.00		11.20	45.00	9041060115000	85.00	20.10	9041070115000	103.00	38.10	9041080115000	127.00	62.10
115	11.50-11.99	12.70	1/2	11.20		9041060115050			9041070115050			9041080115050		
120	12.00-12.49	12.00		11.70	45.00	9041060120000	87.00	21.00	9041070120000	106.00	39.70	9041080120000	131.00	64.70
120	12.00-12.49	12.70	1/2	11.70		9041060120050			9041070120050			9041080120050		
125	12.50-12.99	14.00		12.20	45.00	9041060125000	89.00	21.90	9041070125000	108.00	41.30	9041080125000	134.00	67.30
125	12.50-12.99	15.875	5/8	12.20		9041060125050			9041070125050			9041080125050		
130	13.00-13.49	14.00		12.70	45.00	9041060130000	90.00	22.60	9041070130000	110.00	42.90	9041080130000	137.00	69.90
130	13.00-13.49	15.875	5/8	12.70		9041060130050			9041070130050			9041080130050		
135	13.50-13.99	14.00		13.20	45.00	9041060135000	92.00	23.60	9041070135000	113.00	44.60	9041080135000	141.00	72.60
135	13.50-13.99	15.875	5/8	13.20		9041060135050			9041070135050			9041080135050		
140	14.00-14.49	14.00		13.70	45.00	9041060140000	93.00	24.50	9041070140000	115.00	46.20	9041080140000	144.00	75.20
140	14.00-14.49	15.875	5/8	13.70		9041060140050			9041070140050			9041080140050		
145	14.50-14.99	16.00		14.20	48.00	9041060145000	98.00	25.30	9041070145000	120.00	47.80	9041080145000	150.00	77.80
145	14.50-14.99	15.875	5/8	14.20		9041060145050			9041070145050			9041080145050		
150	15.00-15.49	16.00		14.70	48.00	9041060150000	100.00	26.10	9041070150000	123.00	49.30	9041080150000	154.00	80.30
150	15.00-15.49	15.875	5/8	14.70		9041060150050			9041070150050			9041080150050		
155	15.50-15.99	16.00		15.20	48.00	9041060155000	101.00	27.00	9041070155000	125.00	50.90	9041080155000	157.00	82.90
155	15.50-15.99	15.875	5/8	15.20		9041060155050			9041070155050			9041080155050		
160	16.00-16.49	16.00		15.70	48.00	9041060160000	102.00	27.80	9041070160000	127.00	52.90	9041080160000	160.00	85.90
160	16.00-16.49	15.875	5/8	15.70		9041060160050			9041070160050			9041080160050		
165	16.50-16.99	18.00		16.20	48.00	9041060165000	105.00	28.70	9041070165000	130.00	54.10	9041080165000	164.00	88.10
165	16.50-16.99	19.05	3/4	16.20		9041060165050			9041070165050			9041080165050		
170	17.00-17.49	18.00		16.70	48.00	9041060170000	106.00	29.60	9041070170000	132.00	55.80	9041080170000	167.00	90.80
170	17.00-17.49	19.05	3/4	16.70		9041060170050			9041070170050			9041080170050		
175	17.50-17.99	18.00		17.20	48.00	9041060175000	107.00	30.40	9041070175000	134.00	57.40	9041080175000	170.00	93.40
175	17.50-17.99	19.05	3/4	17.20		9041060175050			9041070175050			9041080175050		
180	18.00-18.49	18.00		17.70	48.00	9041060180000	109.00	31.20	9041070180000	137.00	58.90	9041080180000	174.00	95.90
180	18.00-18.49	19.05	3/4	17.70		9041060180050			9041070180050			9041080180050		

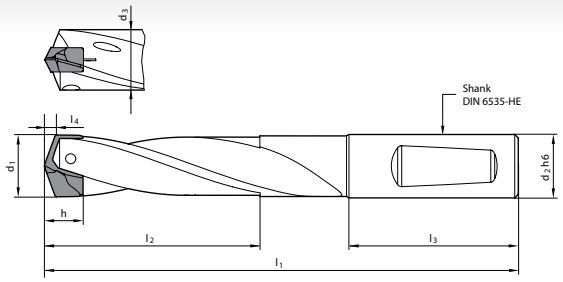
Holders are always supplied with clamping screw, Guhring no. 4071, and screwdriver, Guhring no. 1612.

Holders

③ *Continued from previous page*

Holder Size	d1 Insert Range mm	d2 mm	d2 in	d3 mm	l3 mm	Series 4106 (1.5xD) EDP No.	l1* mm	l2 mm	Series 4107 (3xD) EDP No.	l1* mm	l2 mm	Series 4108 (5xD) EDP No.	l1* mm	l2 mm
185	18.50-18.99	20.00		18.20	50.00	9041060185000	113.00	32.10	9041070185000	141.00	60.50	9041080185000	179.00	98.50
185	18.50-18.99	19.05	3/4	18.20		9041060185050			9041070185050			9041080185050		
190	19.00-19.49	20.00		18.70	50.00	9041060190000	114.00	32.90	9041070190000	143.00	62.10	9041080190000	182.00	101.10
190	19.00-19.49	19.05	3/4	18.70		9041060190050			9041070190050			9041080190050		
195	19.50-19.99	20.00		19.20	50.00	9041060195000	116.00	33.70	9041070195000	146.00	63.70	9041080195000	186.00	103.70
195	19.50-19.99	19.05	3/4	19.20		9041060195050			9041070195050			9041080195050		
200	20.00-20.49	20.00		19.70	50.00	9041060200000	117.00	34.60	9041070200000	148.00	65.30	9041080200000	189.00	106.30
200	20.00-20.49	19.05	3/4	19.70		9041060200050			9041070200050			9041080200050		
205	20.50-20.99	25.00		20.20	56.00	9041060205000	128.00	35.50	9041070205000	159.00	67.00	9041080205000	201.00	109.00
205	20.50-20.99	25.40	1.0"	20.20		9041060205050			9041070205050			9041080205050		
210	21.00-21.49	25.00		20.70	56.00	9041060210000	129.00	36.40	9041070210000	161.00	68.60	9041080210000	204.00	111.60
210	21.00-21.49	25.40	1.0"	20.70		9041060210050			9041070210050			9041080210050		
215	21.50-21.99	25.00		21.20	56.00	9041060215000	130.00	37.20	9041070215000	163.00	70.10	9041080215000	207.00	114.10
215	21.50-21.99	25.40	1.0"	21.20		9041060215050			9041070215050			9041080215050		
220	22.00-22.49	25.00		21.70	56.00	9041060220000	131.00	38.00	9041070220000	165.00	71.70	9041080220000	210.00	116.70
220	22.00-22.49	25.40	1.0"	21.70		9041060220050			9041070220050			9041080220050		
225	22.50-22.99	25.00		22.20	56.00	9041060225000	134.00	38.90	9041070225000	168.00	73.30	9041080225000	214.00	119.30
225	22.50-22.99	25.40	1.0"	22.20		9041060225050			9041070225050			9041080225050		
230	23.00-23.49	25.00		22.70	56.00	9041060230000	135.00	39.80	9041070230000	170.00	74.90	9041080230000	217.00	121.90
230	23.00-23.49	25.40	1.0"	22.70		9041060230050			9041070230050			9041080230050		
235	23.50-23.99	25.00		23.20	56.00	9041060235000	137.00	40.60	9041070235000	173.00	76.50	9041080235000	221.00	124.50
235	23.50-23.99	25.40	1.0"	23.20		9041060235050			9041070235050			9041080235050		
240	24.00-24.49	25.00		23.70	56.00	9041060240000	138.00	41.50	9041070240000	175.00	78.10	9041080240000	224.00	127.10
240	24.00-24.49	25.40	1.0"	23.70		9041060240050			9041070240050			9041080240050		
245	24.50-24.99	25.00		24.20	56.00	9041060245000	140.00	42.30	9041070245000	177.00	79.70	9041080245000	227.00	129.70
245	24.50-24.99	25.40	1.0"	24.20		9041060245050			9041070245050			9041080245050		
250	25.00-25.49	25.00		24.70	56.00	9041060250000	142.00	43.20	9041070250000	180.00	81.30	9041080250000	231.00	132.30
250	25.00-25.49	25.40	1.0"	24.70		9041060250050			9041070250050			9041080250050		
255	25.50-25.99	32.00		25.20	60.00	9041060255000	148.00	44.00	9041070255000	187.00	82.90	9041080255000	239.00	134.90
255	25.50-25.99	31.75		25.20		9041060255050			9041070255050			9041080255050		

HT 800 WP Interchangeable Insert Drills



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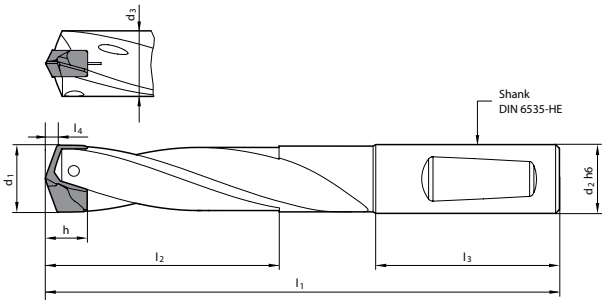
	d1					Series 4106 (1.5xD)			Series 4107 (3xD)			Series 4108 (5xD)		
Holder Size	Insert Range mm	d2 mm	d2 in	d3 mm	l3 mm	EDP No.	l1* mm	l2 mm	EDP No.	l1* mm	l2 mm	EDP No.	l1* mm	l2 mm
260	26.00-26.49	32.00		25.70	60.00	9041060260000	151.00	44.30	9041070260000	191.00	84.00	9041080260000	244.00	137.00
260	26.00-26.49	31.75		25.70		9041060260050			9041070260050			9041080260050		
265	26.50-26.49	32.00		26.20	60.00	9041060265000	153.00	45.10	9041070265000	193.00	86.10	9041080265000	247.00	140.00
265	26.50-26.49	31.75		26.20		9041060265050			9041070265050			9041080265050		
270	27.00-27.49	32.00		26.70	60.00	9041060270000	155.00	46.00	9041070270000	196.00	87.20	9041080270000	251.00	142.00
270	27.00-27.49	31.75		26.70		9041060270050			9041070270050			9041080270050		
275	27.50-27.99	32.00		27.20	60.00	9041060275000	156.00	46.80	9041070275000	198.00	88.90	9041080275000	254.00	144.80
275	27.50-27.99	31.75		27.20		9041060275050			9041070275050			9041080275050		
280	28.00-28.49	32.00		27.70	60.00	9041060280000	157.00	47.70	9041070280000	200.00	90.50	9041080280000	257.00	147.40
280	28.00-28.49	31.75		27.70		9041060280050			9041070280050			9041080280050		
285	28.50-28.99	32.00		28.20	60.00	9041060285000	159.00	48.50	9041070285000	202.00	92.50	9041080285000	260.00	150.40
285	28.50-28.99	31.75		28.20		9041060285050			9041070285050			9041080285050		
290	29.00-29.48	32.00		28.70	60.00	9041060290000	161.00	49.40	9041070290000	205.00	94.60	9041080290000	264.00	153.50
290	29.00-29.49	31.75		28.70		9041060290050			9041070290050			9041080290050		
295	29.50-29.99	32.00		29.20	60.00	9041060295000	162.00	50.20	9041070295000	207.00	95.10	9041080295000	267.00	155.10
295	29.50-29.99	31.75		29.20		9041060295050			9041070295050			9041080295050		
300	30.00-30.49	32.00		29.70	60.00	9041060300000	164.00	50.90	9041070300000	210.00	96.70	9041080300000	271.00	157.60
300	30.00-30.49	31.75		29.70		9041060300050			9041070300050			9041080300050		
305	30.50-30.99	32.00		30.20	60.00	9041060305000	166.00	51.70	9041070305000	212.00	98.30	9041080305000	274.00	160.20
305	30.50-30.99	31.75		30.20		9041060305050			9041070305050			9041080305050		
310	31.00-31.49	32.00		30.70	60.00	9041060310000	167.00	52.60	9041070310000	214.00	99.80	9041080310000	277.00	162.80
310	31.00-31.49	31.75		30.70		9041060310050			9041070310050			9041080310050		
315	31.50-31.99	32.00		31.20	60.00	9041060315000	168.00	53.40	9041070315000	216.00	101.40	9041080315000	280.00	165.40
315	31.50-31.99	31.75		31.20		9041060315050			9041070315050			9041080315050		
320	32.00-32.99	32.00		31.70	60.00	9041060320000	172.00	55.10	9041070320000	221.00	104.60	9041080320000	287.00	170.60
320	32.00-32.99	31.75		31.70		9041060320050			9041070320050			9041080320050		
330	33.00-33.99	32.00		32.70	60.00	9041060330000	175.00	56.80	9041070330000	226.00	107.80	9041080330000	294.00	175.80
330	33.00-39.99	31.75		32.70		9041060330050			9041070330050			9041080330050		
340	34.00-34.99	32.00		33.70	60.00	9041060340050	178.00	58.50	9041070340050	230.00	111.00	9041080340050	300.00	181.00
340	34.00-34.99	31.75		33.70		9041060340050			9041070340050			9041080340050		
350	35.00-35.99	32.00		34.70	60.00	9041060350000	181.00	60.20	9041070350000	235.00	114.20	9041080350000	307.00	186.20
350	35.00-35.09	31.75		34.70		9041060350050			9041070350050			9041080350050		
360	36.00-36.99	32.00		35.70	60.00	9041060360000	184.00	61.80	9041070360000	240.00		9041080360000	314.00	191.30
360	36.00-36.99	31.75		35.70		9041060360050			9041070360050		117.30	9041080360050		
370	37.00-37.99	32.00		36.70	60.00	9041060370000	188.00	63.50	9041070370000	245.00	120.50	9041080370000	321.00	196.50
370	37.00-37.99	31.75		36.70		9041060370050			9041070370050			9041080370050		
380	38.00-38.99	32.00		37.70	60.00	9041060380000	191.00	65.20	9041070380000	249.00	123.70	9041080380000	327.00	201.70
380	38.00-38.99	31.75		37.70		9041060380050			9041070380050			9041080380050		
390	39.00-40.00	32.00		38.70	60.00	9041060390000	194.00	66.90	9041070390000	254.00	126.90	9041080390000	334.00	206.90
390	39.00-40.00	31.75		38.70		9041060390050			9041070390050			9041080390050		

Holders are always supplied with clamping screw, Guhring no. 4071, and screwdriver, Guhring no. 1612.

Extra length holders for drilling - Series 4109 (7xD) and 4110 (10xD)

HSS, coolant fed, nickel treated



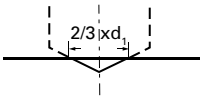
③ **l1 dimensions listed include insert series 4112, 4113, 4114, and 4115 only. Pilot insert series 4111 has different h and l4 dimensions*

Holder Size	d1 Insert Range mm	d2 mm	d2 in	d3 mm	l3 mm	Series 4109 (7xD) EDP No.	l1* mm	l2 mm	Series 4110 (10xD) EDP No.	l1* mm	l2 mm
110	11.00-11.49	12.00		10.70	45.00	9041090110000	147.00	82.60	9041100110000	182.00	117.10
110	11.00-11.49	12.70	1/2	10.70		9041090110050			9041100110050		
115	11.50-11.99	12.00		11.20	45.00	9041090115000	151.00	86.10	9041100115000	187.00	122.10
115	11.50-11.99	12.70	1/2	11.20		9041090115050			9041100115050		
120	12.00-12.49	12.00		11.70	45.00	9041090120000	156.00	89.70	9041100120000	194.00	127.20
120	12.00-12.49	12.70	1/2	11.70		9041090120050			9041100120050		
125	12.50-12.99	14.00		12.20	45.00	9041090125000	160.00	93.30	9041100125000	199.00	132.30
125	12.50-12.99	15.875	5/8	12.20		9041090125050			9041100125050		
130	13.00-13.49	14.00		12.70	45.00	9041090130000	164.00	96.90	9041100130000	205.00	137.50
130	13.00-13.49	15.875	5/8	12.70		9041090130050			9041100130050		
135	13.50-13.99	14.00		13.20	45.00	9041090135000	169.00	100.60	9041100135000	211.00	142.50
135	13.50-13.99	15.875	5/8	13.20		9041090135050			9041100135050		
140	14.00-14.49	14.00		13.70	45.00	9041090140000	173.00	104.20	9041100140000	217.00	147.70
140	14.00-14.49	15.875	5/8	13.70		9041090140050			9041100140050		
145	14.50-14.99	16.00		14.20	48.00	9041090145000	180.00	107.80	9041100145000	225.00	152.80
145	14.50-14.99	15.875	5/8	14.20		9041090145050			9041100145050		
150	15.00-15.49	16.00		14.70	48.00	9041090150000	185.00	111.30	9041100150000	232.00	157.80
150	15.00-15.49	15.875	5/8	14.70		9041090150050			9041100150050		
155	15.50-15.99	16.00		15.20	48.00	9041090155000	189.00	114.90	9041100155000	237.00	162.90
155	15.50-15.99	15.875	5/8	15.20		9041090155050			9041100155050		
160	16.00-16.49	16.00		15.70	48.00	9041090160000	193.00	118.90	9041100160000	243.00	168.00
160	16.00-16.49	15.875	5/8	15.70		9041090160050			9041100160050		
165	16.50-16.99	18.00		16.20	48.00	9041090165000	198.00	122.10	9041100165000	249.00	173.10
165	16.50-16.99	19.05	3/4	16.20		9041090165050			9041100165050		
170	17.00-17.49	18.00		16.70	48.00	9041090170000	202.00	125.80	9041100170000	255.00	178.30
170	17.00-17.49	19.05	3/4	16.70		9041090170050			9041100170050		
175	17.50-17.99	18.00		17.20	48.00	9041090175000	206.00	129.40	9041100175000	260.00	183.50
175	17.50-17.99	19.05	3/4	17.20		9041090175050			9041100175050		
180	18.00-18.49	18.00		17.70	48.00	9041090180000	211.00	132.90	9041100180000	267.00	188.40
180	18.00-18.49	19.05	3/4	17.70		9041090180050			9041100180050		

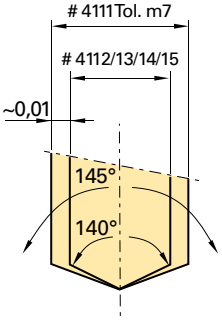
Holders are always supplied with clamping screw, Guhring no. 4071, and screwdriver, Guhring no. 1612.

Holders

For drilling depths over 5xD, we generally recommend spot drilling prior to finish drilling to depth. Drilling depths over 7xD will typically require use of a series 4105 pilot drill with a series 4111 (145°) insert.



Spot drill for 7xD drilling depths



Pilot drill for 10xD drilling depths (see page 10-11)

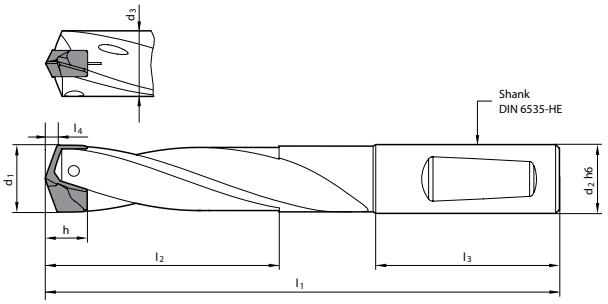
③

Holder Size	d1 Insert Range mm	d2 mm	d2 in	d3 mm	l3 mm	Series 4109 (7xD) EDP No.	l1* mm	l2 mm	Series 4110 (10xD) EDP No.	l1* mm	l2 mm
185	18.50-18.99	20.00		18.20	50.00	9041090185000	217.00	136.50	9041100185000	274.00	193.50
185	18.50-18.99	19.05	3/4	18.20		9041090185050			9041100185050		
190	19.00-19.49	20.00		18.70	50.00	9041090190000	221.00	140.10	9041100190000	280.00	198.70
190	19.00-19.49	19.05	3/4	18.70		9041090190050			9041100190050		
195	19.50-19.99	20.00		19.20	50.00	9041090195000	226.00	143.70	9041100195000	286.00	203.70
195	19.50-19.99	19.05	3/4	19.20		9041090195050			9041100195050		
200	20.00-20.49	20.00		19.70	50.00	9041090200000	230.00	147.30	9041100200000	292.00	208.90
200	20.00-20.49	19.05	3/4	19.70		9041090200050			9041100200050		
205	20.50-20.99	25.00		20.20	56.00	9041090205000	243.00	151.00	9041100205000	306.00	214.00
205	20.50-20.99	25.40	1.0"	20.20		9041090205050			9041100205050		
210	21.00-21.49	25.00		20.70	56.00	9041090210000	247.00	154.60	9041100210000	312.00	219.10
210	21.00-21.49	25.40	1.0"	20.70		9041090210050			9041100210050		
215	21.50-21.99	25.00		21.20	56.00	9041090215000	251.00	158.10	9041100215000	317.00	224.20
215	21.50-21.99	25.40	1.0"	21.20		9041090215050			9041100215050		
220	22.00-22.49	25.00		21.70	56.00	9041090220000	255.00	161.70	9041100220000	323.00	229.30
220	22.00-22.49	25.40	1.0"	21.70		9041090220050			9041100220050		
225	22.50-22.99	25.00		22.20	56.00	9041090225000	260.00	165.30	9041100225000	329.00	234.40
225	22.50-22.99	25.40	1.0"	22.20		9041090225050			9041100225050		
230	23.00-23.49	25.00		22.70	56.00	9041090230000	264.00	168.90	9041100230000	335.00	239.50
230	23.00-23.49	25.40	1.0"	22.70		9041090230050			9041100230050		
235	23.50-23.99	25.00		23.20	56.00	9041090235000	269.00	172.50	9041100235000	341.00	244.60
235	23.50-23.99	25.40	1.0"	23.20		9041090235050			9041100235050		
240	24.00-24.49	25.00		23.70	56.00	9041090240000	273.00	176.10	9041100240000	347.00	249.70
240	24.00-24.49	25.40	1.0"	23.70		9041090240050			9041100240050		
245	24.50-24.99	25.00		24.20	56.00	9041090245000	277.00	179.70	9041100245000	352.00	254.80
245	24.50-24.99	25.40	1.0"	24.20		9041090245050			9041100245050		
250	25.00-25.49	25.00		24.70	56.00	9041090250000	282.00	183.30	9041100250000	359.00	259.90
250	25.00-25.49	25.40	1.0"	24.70		9041090250050			9041100250050		
255	25.50-25.99	32.00		25.20	60.00	9041090255000	291.00	186.90	9041100255000	369.00	265.00
255	25.50-25.99	31.75		25.20		9041090255050			9041100255050		

Holders are always supplied with clamping screw, Guhring no. 4071, and screwdriver, Guhring no. 1612.

Extra length holders for drilling - Series 4109 (7xD) and 4110 (10xD)

HSS, coolant fed, nickel treated

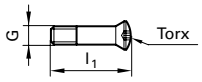


③ *Continued from previous page*

	d1					Series 4109 (7xD)			Series 4110 (10xD)		
Holder Size	Insert Range mm	d2 mm	d2 in	d3 mm	l3 mm	EDP No.	l1* mm	l2 mm	EDP No.	l1* mm	l2 mm
260	26.00 - 26.49	32.00		25.70	60.00	9041090260000	297.00	190.00	9041100260000	377.00	270.00
260	26.00 - 26.49	31.75		25.70		9041090260050			9041100260050		
265	26.50 - 26.99	32.00		26.20	60.00	9041090265000	301.00	194.00	9041100265000	382.00	275.00
265	26.50 - 26.99	31.75		26.20		9041090265050			9041100265050		
270	27.00 - 27.49	32.00		26.70	60.00	9041090270000	306.00	197.20	9041100270000	388.00	280.10
270	27.00 - 27.49	31.75		26.70		9041090270050			9041100270050		
275	27.50 - 27.99	32.00		27.20	60.00	9041090275000	310.00	200.80	9041100275000	394.00	285.20
275	27.50 - 27.99	31.75		27.20		9041090275050			9041100275050		
280	28.00 - 28.49	32.00		27.70	60.00	9041090280000	314.00	204.40	9041100280000	400.00	290.30
280	28.00 - 28.49	31.75		27.70		9041090280050			9041100280050		
285	28.50 - 28.99	32.00		28.20	60.00	9041090285000	318.00	208.40	9041100285000	405.00	295.40
285	28.50 - 28.99	31.75		28.20		9041090285050			9041100285050		
290	29.00 - 29.49	32.00		28.70	60.00	9041090290000	323.00	212.50	9041100290000	412.00	300.50
290	29.00 - 29.49	31.75		28.70		9041090290050			9041100290050		
295	29.50 - 29.99	32.00		29.20	60.00	9041090295000	327.00	215.10	9041100295000	418.00	305.60
295	29.50 - 29.99	31.75		29.20		9041090295050			9041100295050		
300	30.00 - 30.49	32.00		29.70	60.00	9041090300000	332.00	218.60	9041100300000	424.00	310.60
300	30.00 - 30.49	31.75		29.70		9041090300050			9041100300050		
305	30.50 - 30.99	32.00		30.20	60.00	9041090305000	336.00	222.20	9041100305000	429.00	315.70
305	30.50 - 30.99	31.75		30.20		9041090305050			9041100305050		
310	31.00 - 31.49	32.00		30.70	60.00	9041090310000	340.00	225.80	9041100310000	435.00	320.80
310	31.00 - 31.49	31.75		30.70		9041090310050			9041100310050		
315	31.50 - 31.99	32.00		31.20	60.00	9041090315000	344.00	229.40	9041100315000	441.00	325.90
315	31.50 - 31.99	31.75		31.20		9041090315050			9041100315050		

Clamping screws for HT 800 inserts

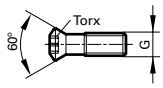
Series 4071



For holder size	Size	OAL	with Torx	EDP No.
110/115	M2.2	9.50	T7	9040710022000
120/125	M2.2	10.50	T7	9040710022010
130/135	M2.5	11.40	T8	9040710025000
140/145	M3	12.10	T9	9040710030000
150/155	M3	13.10	T9	9040710030010
160 - 175	M3.5	14.25	T10	9040710035000
180 - 195	M4	16.00	T15	9040710040000
200 - 215	M4.5	18.00	T15	9040710045000
220 - 235	M5	19.75	T20	9040710050000
240 - 255	M5	21.75	T20	9040710050010
260 - 295	M5	23.40	T20	9040710050030
300 - 315	M6	27.00	T25	9040710060000
320 - 350	M6	28.50	T25	9040710060010
360 - 390	M6	32.50	T25	9040710060020

Clamping screws for chamfering inserts

Series 6128



For holder size	Size	OAL	with Torx	EDP No.
110 - 140	M2.0	5.5	T6	9061280020000
160 - 240	M2.5	5.3	T7	9061280025000
300 - 360	M4.0	9.5	T15	9061280040000

Torx driver

Series 4915

Type	Drive	l1 mm	Tightening torque (Ncm)	EDP No.
A	1/4"	160.00	0.8 - 2	9049150020000
A	1/4"	160.00	2 - 8	9049150080000
A	1/4"	200.00	5 - 14	9049150140000

Screw driver

Series 1612

For holder size	for Torx	EDP No.
Pilot holder 110 - 140	T6	9016120060000
Pilot holder 160 - 280	T7	9016120070000
110 - 125	T7	9016120070010
130/135	T8	9016120080010
140 - 155	T9	9016120090010
160 - 175	T10	9016120100010
Pilot holder 300 - 360	T15	9016120150000
180 - 215	T15	9016120150010
220-295	T20	9016120200010
300 - 390	T25	9016120250000

Torx Bits

Series 4917

for Torx	Drive	l1 mm	EDP No.
T7	1/4"	25	9049170070000
T8	1/4"	25	9049170080000
T9	1/4"	25	9049170090000
T10	1/4"	25	9049170100000
T15	1/4"	25	9049170150000
T20	1/4"	25	9049170200000
T25	1/4"	25	9049170250000

Torque values for clamping screws

Diameter range	11.0 - 12.99	13.0 - 13.99	14.0 - 15.99	16.0 - 17.99	18.0 - 19.99	20.0 - 21.99	22.0 - 25.99
Thread	M2.2	M2.5	M3	M3.5	M4	M4.5	M5
Torx size	T7	T8	T9	T10	T15	T15	T20
Tightening torque (Ncm)	80	100	170	270	400	580	810

Using These Tables. The Speeds & Feeds listed below are conservative recommendations for initial setup. In actual use, depending on the machining environment and workpiece material, significantly higher speeds and feeds may be achievable. Using the below as a starting point, cutting speed/feed can be gradually adjusted upwords until the optimum settings per application are found. Questions? Contact us by telephone at (800) 776-6170.

Series # 4107 body (3xD) with # 4112 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Common structural steels	≤100 Bhn	425	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>100-260 Bhn	360	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Free-cutting steels	≤24 Rc	425	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
	>24-30 Rc	360	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Unalloyed heat-treatable steels	≤16 Rc	425	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	16-24 Rc	410	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	24-30 Rc	360	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Alloyed heat-treatable steels	24-30 Rc	360	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>30-38 Rc	295	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Unalloyed case hardened steels	≤230 Bhn	425	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Alloyed case hardened steels	24-30 Rc	360	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>30-38 Rc	230	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Nitriding steels	≥24-30 Rc	345	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>30-38 Rc	230	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Tool steels	≤24 Rc	195	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>24-30 Rc	180	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
High speed steels	≥14-30 Rc	180	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
Spring steels	≤330 Bhn	165	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Stainless steels, sulphured	≤24 Rc	180	•	•	•	•	0.005	0.006	0.01	0.01	0.012	0.012
austenitic	≤24 Rc	130	•	•	•	•	0.005	0.006	0.01	0.01	0.012	0.012
martensitic	≤24 Rc	115	•	•	•	•	0.005	0.006	0.01	0.01	0.012	0.012
Hardened steels	≤40-48 Rc	80	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Special alloys	≤38 Rc	80	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Ti and Ti-alloys	≤24 Rc	130	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
	>24-38 Rc	115	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01

Series # 4107 body (3xD) with # 4113 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Cast iron	≤240 Bhn	330	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	<300 Bhn	295	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Spheroidal graphite iron and	≤240 Bhn	395	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
malleable cast iron	<300 Bhn	330	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Chilled cast iron	≤350 Bhn	295	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02

Series # 4107 body (3xD) with # 4114 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Aluminium and Al-alloys	≤120 Bhn	1000	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Al wrought alloys	≤150 Bhn	1000	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Al cast alloys ≤ 10 % Si	≤200 Bhn	845	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
> 10 % Si	≤200 Bhn	710	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Magnesium alloys	≤150 Bhn	900	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Copper, low-alloyed	≤120 Bhn	400	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Brass, short-chipping	≤200 Bhn	1050	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
long-chipping	≤200 Bhn	710	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Bronze, short-chipping	≤200 Bhn	410	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>200-260 Bhn	345	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024

Series # 4107 body (3xD) with # 4115 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Stainless steels, sulphured	≤24 Rc	180	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
austenitic	≤24 Rc	130	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
martensitic	≤24 Rc	115	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
Chilled cast iron	≤350 Bhn	•	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Ti and Ti-alloys	≤24 Rc	130	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
	>24-38 Rc	115	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01

Series # 4108 body (5xD) with # 4112 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Common structural steels	≤100 Bhn	410	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>100-260 Bhn	345	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Free-cutting steels	≤24 Rc	410	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
	>24-30 Rc	345	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Unalloyed heat-treatable steels	≤16 Rc	410	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	16-24 Rc	395	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	24-30 Rc	345	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Alloyed heat-treatable steels	24-30 Rc	345	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>30-38 Rc	280	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Unalloyed case hardened steels	≤230 Bhn	410	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Alloyed case hardened steels	24-30 Rc	345	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>30-38 Rc	230	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Nitriding steels	≥24-30 Rc	345	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>30-38 Rc	230	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Tool steels	≤24 Rc	180	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>24-30 Rc	165	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
High speed steels	≥14-30 Rc	180	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
Spring steels	≤330 Bhn	165	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Stainless steels, sulphured	≤24 Rc	180	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
austenitic	≤24 Rc	130	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
martensitic	≤24 Rc	115	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
Hardened steels	≤40-48 Rc	80	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Special alloys	≤38 Rc	80	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Ti and Ti-alloys	≤24 Rc	130	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
	>24-38 Rc	115	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01

Series # 4108 body (5xD) with # 4113 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Cast iron	≤240 Bhn	330	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	<300 Bhn	295	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Spheroidal graphite iron and	≤240 Bhn	395	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
malleable cast iron	<300 Bhn	330	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Chilled cast iron	≤350 Bhn	295	•	•	•	•	0.01	0.012	0.016	0.02	0.016	0.02

Series # 4108 body (5xD) with # 4114 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Aluminium and Al-alloys	≤120 Bhn	590	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Al wrought alloys	≤150 Bhn	590	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Al cast alloys ≤ 10 % Si	≤200 Bhn	460	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
> 10 % Si	≤200 Bhn	360	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Magnesium alloys	≤150 Bhn	590	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
Copper, low-alloyed	≤120 Bhn	230	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Brass, short-chipping	≤200 Bhn	590	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
long-chipping	≤200 Bhn	395	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Bronze, short-chipping	≤200 Bhn	195	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>200-260 Bhn	130	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02

Series # 4108 body (5xD) with # 4115 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Stainless steels, sulphured	≤24 Rc	180	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
austenitic	≤24 Rc	130	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
martensitic	≤24 Rc	115	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
Cast iron	≤240 Bhn	•	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Ti and Ti-alloys	≤24 Rc	•	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
	>24-38 Rc	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01

Using These Tables. The Speeds & Feeds listed below are conservative recommendations for initial setup. In actual use, depending on the machining environment and workpiece material, significantly higher speeds and feeds may be achievable. Using the below as a starting point, cutting speed/feed can be gradually adjusted upwords until the optimum settings per application are found. Questions? Contact us by telephone at (800) 776-6170.

Series # 4109 body (7xD) with # 4112 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Common structural steels	≤100 Bhn	395	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>100-260 Bhn	345	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Free-cutting steels	≤24 Rc	395	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>24-30 Rc	345	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Unalloyed heat-treatable steels	≤16 Rc	395	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	16-24 Rc	360	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	24-30 Rc	330	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Alloyed heat-treatable steels	24-30 Rc	330	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>30-38 Rc	280	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Unalloyed case hardened steels	≤230 Bhn	395	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Alloyed case hardened steels	24-30 Rc	330	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>30-38 Rc	230	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Nitriding steels	≥24-30 Rc	345	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
	>30-38 Rc	230	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
Tool steels	≤24 Rc	180	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
	>24-30 Rc	165	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
High speed steels	≥14-30 Rc	180	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Spring steels	≤330 Bhn	165	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Stainless steels, sulphured	≤24 Rc	180	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
austenitic	≤24 Rc	130	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
martensitic	≤24 Rc	115	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Hardened steels	≤40-48 Rc	80	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.006
Special alloys	≤38 Rc	80	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.006

Series # 4109 body (7xD) with # 4113 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Cast iron	≤240 Bhn	260	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	<300 Bhn	230	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Spheroidal graphite iron and	≤240 Bhn	330	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
malleable cast iron	<300 Bhn	260	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Chilled cast iron	≤350 Bhn	230	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024

Series # 4109 body (7xD) with # 4114 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Aluminium and Al-alloys	≤120 Bhn	590	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Al wrought alloys	≤150 Bhn	590	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Al cast alloys ≤ 10 % Si	≤200 Bhn	460	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
> 10 % Si	≤200 Bhn	360	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Magnesium alloys	≤150 Bhn	590	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Copper, low-alloyed	≤120 Bhn	230	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Brass, short-chipping	≤200 Bhn	590	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
long-chipping	≤200 Bhn	395	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Bronze, short-chipping	≤200 Bhn	195	•	•	•	•	0.008	0.010	0.012	0.016	•	•
	>200-260 Bhn	130	•	•	•	•	0.006	0.008	0.010	0.012	•	•

Series # 4109 body (7xD) with # 4115 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Stainless steels, sulphured	≤24 Rc	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
austenitic	≤24 Rc	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
martensitic	≤24 Rc	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Cast iron	≤240 Bhn	•	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Ti and Ti-alloys	≤24 Rc	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
	>24-38 Rc	•	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008

Series # 4110 body (10xD) with # 4112 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Common structural steels	≤100 Bhn	410	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>100-260 Bhn	345	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Free-cutting steels	≤24 Rc	410	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	>24-30 Rc	345	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Unalloyed heat-treatable steels	≤16 Rc	410	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	16-24 Rc	395	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	24-30 Rc	345	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Alloyed heat-treatable steels	24-30 Rc	345	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>30-38 Rc	280	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Unalloyed case hardened steels	≤230 Bhn	410	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Alloyed case hardened steels	24-30 Rc	345	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>30-38 Rc	230	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
Nitriding steels	≥24-30 Rc	345	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
	>30-38 Rc	230	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
Tool steels	≤24 Rc	180	•	•	•	•	0.006	0.008	0.01	0.012	0.012	0.016
	>24-30 Rc	165	•	•	•	•	0.005	0.006	0.008	0.01	0.01	0.012
High speed steels	≥14-30 Rc	180	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Spring steels	≤330 Bhn	165	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Stainless steels, sulphured	≤24 Rc	180	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
austenitic	≤24 Rc	130	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
martensitic	≤24 Rc	115	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Hardened steels	≤40-48 Rc	80	•	•	•	•	•	•	•	•	•	•
Special alloys	≤38 Rc	80	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008
Ti and Ti-alloys	≤24 Rc	130	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
	>24-38 Rc	115	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008

Series # 4110 body (10xD) with # 4113 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Cast iron	≤240 Bhn	330	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
	<300 Bhn	295	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Spheroidal graphite iron and	≤240 Bhn	395	•	•	•	•	0.012	0.016	0.02	0.025	0.025	0.032
malleable cast iron	<300 Bhn	330	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.02
Chilled cast iron	≤350 Bhn	295	•	•	•	•					•	•

Series # 4110 body (10xD) with # 4114 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Aluminium and Al-alloys	≤120 Bhn	590	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Al wrought alloys	≤150 Bhn	590	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Al cast alloys ≤ 10 % Si	≤200 Bhn	460	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
> 10 % Si	≤200 Bhn	360	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Magnesium alloys	≤150 Bhn	590	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Copper, low-alloyed	≤120 Bhn	230	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Brass, short-chipping	≤200 Bhn	590	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
long-chipping	≤200 Bhn	395	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
Bronze, short-chipping	≤200 Bhn	195	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02
	>200-260 Bhn	130	•	•	•	•	0.008	0.01	0.012	0.016	0.016	0.02

Series # 4110 body (10xD) with # 4115 insert

Material group	Hardness	SFM	Feed Rate - IPR									
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Stainless steels, sulphured	≤24 Rc	180	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
austenitic	≤24 Rc	130	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
martensitic	≤24 Rc	115	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
Cast iron	≤240 Bhn	•	•	•	•	•	0.01	0.012	0.016	0.02	0.02	0.024
Ti and Ti-alloys	≤24 Rc	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.01
	>24-38 Rc	•	•	•	•	•	0.003	0.004	0.005	0.006	0.006	0.008

FIREX®/nanoFIREX®

Coating color: violet

This TiAlN/TiN multi-layer coating is applied to HSS and carbide drills. It offers outstanding wear resistance in drilling operations and high heat resistance. Besides conventional wet applications this coating is suitable for minimum lubrication and dry machining, often combined with MolyGlide to optimise the running-in wear and improved resistance to galling.

TiAlN SuperA/nanoA

Coating color: grey-violet

The well established A-coating has been developed at Guhring. By optimizing the structural, chemical and mechanical properties of the new Super-A coating an extremely high hot hardness, very good oxidation resistance and excellent coating adhesion have been achieved. This coating is used exclusively on carbide cutting tools and is ideally suited for difficult to machine aerospace materials such as titanium alloys, Inconel as well as machining hardened steel materials (>52 HRC) and HSC applications.

TiAlN

Coating color: violet

The mono-layer TiAlN coating is suited for abrasive operations with carbide tools because of its high hardness and chemical resistance, e.g. hard machining and high speed cutting (HSC).

TiCN

Coating color: grey

End mills and taps exposed to high mechanical load are coated with TiCN. With respect to the high hardness and toughness of TiCN coating the tools offer good machining results operating with interrupted cutting.

TiN

Coating color: yellow-golden

The mono-layer titanium nitride coating is standard for HSS and carbide tools. Used for drilling, tapping and milling operations. Nevertheless, most applications is steel machining.

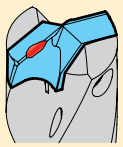
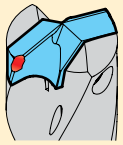
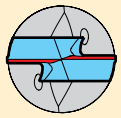
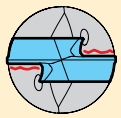
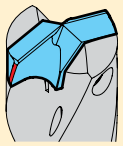
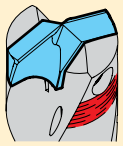
bright

Due to their basically good properties, high speed steel and carbide tools are supplied without being surface treated, i.e. in a bright finish. Guhring offers bright tools in its standard range only as basic tools for a cost-efficient coating to customer specific requirements.

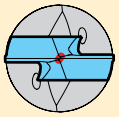
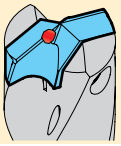
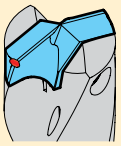
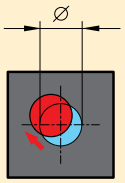
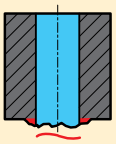
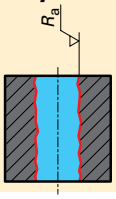
HT 800 WP Special Solutions

- stepped holders
- special clamping chucks
- inserts with special coatings and geometries, e.g. radius inserts or inserts with point angles 90° to 180°

12 tips to help diagnose problems

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

12 tips to help diagnose problems

Problem	Cause	Remedy
7 Heavy chisel edge wear 	cutting speed too low	increase cutting speed
	feed too high	reduce feed
	excessive honing of cutting lip	reduce cutting lip honing
8 Crumbling at intersection, web thinning and cutting lip 	clearance angle too small	increase clearance angle
	excessive honing of cutting lip	reduce cutting lip honing
	incorrect tool type	apply suitable tool
9 Plastic deformation of outer corner 	cutting speed too high	reduce cutting speed
	insufficient coolant volume	increase volume/pressure
	incorrect or no honing at corner	correct honing
10 Misalignment 	non rigid conditions, insufficient workpiece clamping	rigid clamping of workpiece
	deviation from concentricity too large	check and correct concentricity if possible
	spotting area transverse	use milling cutter (2-fluted) for spotting
	chisel edge too large	reduce chisel edge
11 Heavy burring on break-through 	feed too high	reduce feed
	max. wear values exceeded	reduce tool change intervals
	excessive honing of cutting lip	reduce cutting lip honing
12 Unsatisfactory surface quality 	non rigid conditions, insufficient workpiece clamping	rigid clamping of workpiece
	deviation from concentricity too large	check and correct concentricity if possible
	insufficient coolant volume	increase volume/pressure

Thread milling cutters by GUHRING

The Tool Company

Features and Benefits:

Sub-micro grain carbide substrate
Longer tool life with tighter tolerances

More cost-effective than indexable thread mills

PVD TiCN coating standard on many series
Extends tool life by providing heat and wear resistance

Helical flute design reduces chatter

The same carbide thread mill can produce
- Right or left hand threads
- Single or multiple thread leads

Countersink style thread mills eliminate secondary operations

Coolant-fed style thread mills
For improved chip evacuation and better surface finish

Drill & thread mill styles combine drill and threading into one tool

Well-suited for:

- *Steels*
- *Stainless steels*
- *Titanium and alloys*
- *High-temperature alloys*
- *Non-ferrous materials*

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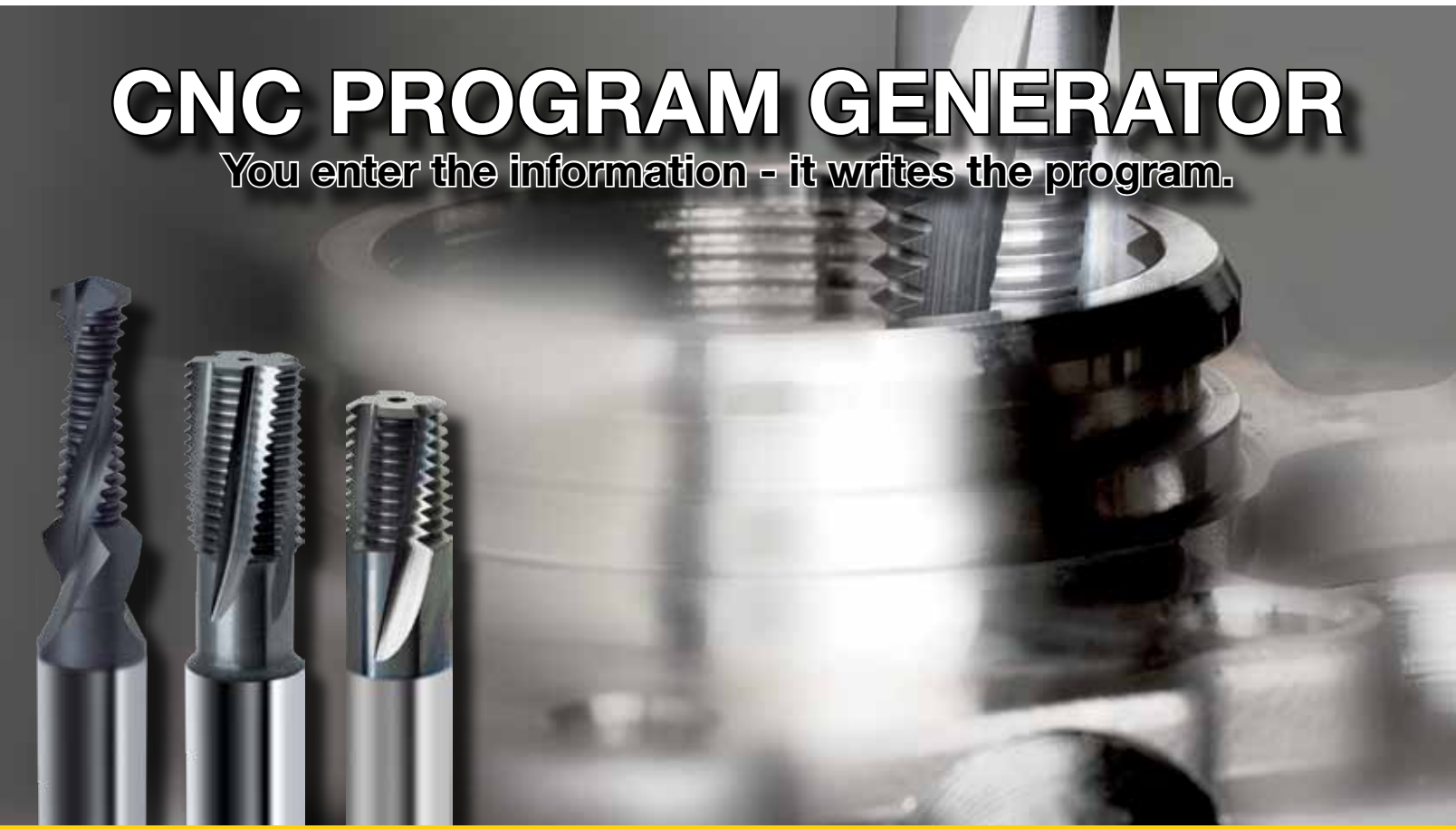

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