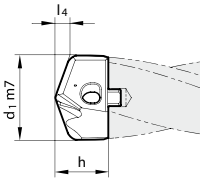
Pilot drill inserts - Series 4111

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.

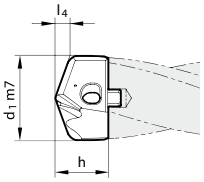


Series 4111

d1 fract.	d1 mm	h mm	b mm	l4 mm	Series 4111 nano-A insert EDP No.	Drill body Size	Pilot Drill body Size
	11.00	7.2	4.5	1.5	9041110110000	110	110
	11.20	7.2	4.5	1.5	9041110112000		
	11.50	7.2	4.5	1.9	9041110115000	115	110
29/64	11.51	7.2	4.5	1.9	9041110115100		
	11.70	7.2	4.5	1.9	9041110117000		
	11.80	7.2	4.5	1.9	9041110118000		
15/32	11.91	7.2	4.5	1.9	9041110119100		
	12.00	7.4	5.0	1.9	9041110120000	120	120
	12.10	7.4	5.0	2.0	9041110121000		
	12.20	7.4	5.0	2.0	9041110122000		
31/64	12.30	7.4	5.0	2.0	9041110123000		
	12.50	7.4	5.0	2.0	9041110125000	125	120
	12.60	7.4	5.0	2.0	9041110126000		
1/2	12.70	7.4	5.0	2.1	9041110127000		
	12.80	7.4	5.0	2.1	9041110128000		
	12.90	7.4	5.0	2.1	9041110129000		
	13.00	8.2	5.5	2.1	9041110130000	130	130
33/64	13.10	8.2	5.5	2.1	9041110131000		
17/32	13.49	8.2	5.5	2.2	9041110134900		
	13.50	8.2	5.5	2.2	9041110135000	135	130
	13.60	8.2	5.5	2.2	9041110136000		
	13.70	8.2	5.5	2.2	9041110137000		
	13.80	8.2	5.5	2.2	9041110138000		
35/64	13.89	8.2	5.5	2.2	9041110138900		
	14.00	9.4	6.0	2.3	9041110140000	140	140
	14.10	9.4	6.0	2.3	9041110141000		
9/16	14.29	9.4	6.0	2.3	9041110142900		
	14.40	9.4	6.0	2.3	9041110144000		
	14.50	9.4	6.0	2.3	9041110145000	145	140
	14.60	9.4	6.0	2.4	9041110146000		
37/64	14.68	9.4	6.0	2.4	9041110146800		
	14.70	9.4	6.0	2.4	9041110147000		
	14.80	9.4	6.0	2.4	9041110148000		
	15.00	9.4	6.0	2.4	9041110150000	150	140
19/32	15.08	9.4	6.0	2.4	9041110150800		
	15.10	9.4	6.0	2.4	9041110151000		
	15.20	9.4	6.0	2.4	9041110152000		
	15.30	9.4	6.0	2.5	9041110153000		
39/64	15.48	9.4	6.0	2.5	9041110154800		
	15.50	9.4	6.0	2.5	9041110155000	155	140
	15.60	9.4	6.0	2.5	9041110156000		
	15.70	9.4	6.0	2.5	9041110157000		
	15.80	9.4	6.0	2.5	9041110158000		
5/8	15.87	9.4	6.0	2.6	9041110158700		
	16.00	10.6	7.0	2.6	9041110160000	160	160
41/64	16.27	10.6	7.0	2.6	9041110162700		
	16.50	10.6	7.0	2.7	9041110165000	165	160
21/32	16.67	10.6	7.0	2.7	9041110166700		

d1 fract.	d1 mm	h mm	b mm	l4 mm	Series 4111 nano-A insert EDP No.	Drill body Size	Pilot Drill body Size
	17.00	10.6	7.0	2.7	9041110170000	170	160
43/64	17.07	10.6	7.0	2.7	9041110170700		
11/16	17.46	10.6	7.0	2.8	9041110174600		
	17.50	10.6	7.0	2.8	9041110175000	175	160
	17.60	10.6	7.0	2.8	9041110176000		
45/64	17.86	10.6	7.0	2.9	9041110178600		
	18.00	12.1	8.0	2.9	9041110180000	180	180
23/32	18.26	12.1	8.0	2.9	9041110182600		
	18.50	12.1	8.0	3.0	9041110185000	185	180
47/64	18.65	12.1	8.0	3.0	9041110186500		
	19.00	12.1	8.0	3.0	9041110190000	190	180
3/4	19.05	12.1	8.0	3.1	9041110190500		
49/64	19.45	12.1	8.0	3.1	9041110194500		
	19.50	12.1	8.0	3.1	9041110195000	195	180
	19.60	12.1	8.0	3.1	9041110196000		
25/32	19.84	12.1	8.0	3.2	9041110198400		
	20.00	13.3	9.0	3.2	9041110200000	200	200
51/64	20.24	13.3	9.0	3.2	9041110202400		
	20.50	13.3	9.0	3.3	9041110205000	205	200
13/16	20.64	13.3	9.0	3.3	9041110206400		
	21.00	13.3	9.0	3.4	9041110210000	210	200
53/64	21.03	13.3	9.0	3.4	9041110210300		
	21.10	13.3	9.0	3.4	9041110211000		
27/32	21.43	13.3	9.0	3.4	9041110214300		
	21.50	13.3	9.0	3.4	9041110215000	215	200
55/64	21.83	13.3	9.0	3.5	9041110218300		
	22.00	14.8	10.0	3.5	9041110220000	220	220
7/8	22.22	14.8	10.0	3.6	9041110222200		
	22.50	14.8	10.0	3.6	9041110225000	225	220
57/64	22.62	14.8	10.0	3.6	9041110226200		
	23.00	14.8	10.0	3.7	9041110230000	230	220
29/32	23.02	14.8	10.0	3.7	9041110230200		
59/64	23.42	14.8	10.0	3.7	9041110234200		
	23.50	14.8	10.0	3.8	9041110235000	235	220
15/16	23.81	14.8	10.0	3.8	9041110238100		
	24.00	15.3	11.0	3.8	9041110240000	240	240
	24.10	15.3	11.0	3.8	9041110241000		
61/64	24.21	15.3	11.0	3.9	9041110242100		
	24.50	15.3	11.0	3.9	9041110245000	245	240
31/32	24.61	15.3	11.0	3.9	9041110246100		
	25.00	15.3	11.0	4.0	9041110250000	250	240
1	25.40	15.3	11.0	4.1	9041110254000		
	25.50	15.3	11.0	4.1	9041110255000	255	240
	26.00	19.4	12.00	4.1	9041110260000	260	260
1 1/32	26.19	19.4	12.00	4.2	9041110261900		
	26.50	19.4	12.00	4.2	9041110265000	265	260
1 3/64	26.59	19.4	12.00	4.2	9041110265900		
	27.00	19.4	12.00	4.3	9041110270000	270	260

Inserts are supplied with clamping screw, series 4071.



Series 4111

d1 fract.	d1 mm	h mm	b mm	l4 mm	Series 4111 nano-A insert EDP No.	Drill body Size	Pilot Drill body Size
	27.50	19.4	12.00	4.4	**9041110275000**		
	27.70	19.4	12.00	4.4	**9041110277000**	275	260
1 3/32	27.78	19.4	12.00	4.4	**9041110277800**		
	28.00	20.1	13.00	4.5	**9041110280000**	280	280
	28.18	20.1	13.00	4.5	**9041110281800**		
	28.50	20.1	13.00	4.5	**9041110285000**	285	280
	28.58	20.1	13.00	4.6	**9041110285800**		
	29.00	20.1	13.00	4.6	**9041110290000**	290	280
1 5/32	29.37	20.1	13.00	4.7	**9041110293700**		
	29.50	20.1	13.00	4.7	**9041110295000**	295	280
1 11/64	29.77	20.1	13.00	4.7	**9041110297700**	295	280
	30.00	21.7	14.00	4.8	**9041110300000**	300	300
1 3/16	30.16	21.7	14.00	4.8	**9041110301600**		
	30.50	21.7	14.00	4.9	**9041110305000**	305	300
	30.96	21.7	14.00	4.9	**9041110309600**		
	31.00	21.7	14.00	4.9	**9041110310000**	310	300
	31.50	21.7	14.00	5.0	**9041110315000**	315	300
1 1/4	31.75	21.7	14.00	5.1	**9041110317500**		
	32.00	22.4	15.00	5.1	**9041110320000**		
	32.50	22.4	15.00	5.2	**9041110325000**	320	320
1 9/32	32.54	22.4	15.00	5.2	**9041110325400**		
1 19/64	32.94	22.4	15.00	5.2	**9041110329400**		
	33.00	22.4	15.00	5.3	**9041110330000**		
1 5/16	33.34	22.4	15.00	5.3	**9041110333400**	330	320
	33.50	22.4	15.00	5.3	**9041110335000**		
	34.00	22.4	15.00	5.4	**9041110340000**		
1 11/32	34.13	22.4	15.00	5.4	**9041110341300**	340	320
	34.50	22.4	15.00	5.5	**9041110345000**		
	34.93	22.4	15.00	5.6	**9041110349300**		
	35.00	22.4	15.00	5.6	**9041110350000**		
	35.50	22.4	15.00	5.6	**9041110355000**	350	320
	35.72	22.4	15.00	5.7	**9041110357200**		
	36.00	23.2	16.00	5.7	**9041110360000**		
	36.50	23.2	16.00	5.8	**9041110365000**	360	360
	36.51	23.2	16.00	5.8	**9041110365100**		
	37.00	23.2	16.00	5.9	**9041110370000**		
1 15/32	37.31	23.2	16.00	5.9	**9041110373100**	370	360
	37.50	23.2	16.00	6.0	**9041110375000**		
	38.00	23.2	16.00	6.0	**9041110380000**		
1 1/2	38.10	23.2	16.00	6.1	**9041110381000**	380	360
1 33/64	38.50	23.2	16.00	6.1	**9041110385000**		
	39.00	23.2	16.00	6.2	**9041110390000**		
	39.50	23.2	16.00	6.3	**9041110395000**	390	360
	40.00	23.2	16.00	6.4	**9041110400000**		

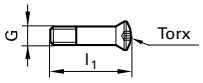
Inserts are supplied with clamping screw, series 4071.

Body 4105 & 4106

Material group	Hardness HRc	Hardness Bhn	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	-	≤ 150	425				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
	≤ 32	≤ 301	360				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
Free-cutting steels	≤ 25	≤ 255	425				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
	≤ 32	≤ 301	360				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
Unalloyed heat-treatable steels	≤ 20	≤ 220	425				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
	≤ 25	≤ 255	410				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
	≤ 32	≤ 301	360				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
Alloyed heat-treatable steels	≤ 32	≤ 301	360				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
	≤ 43	≤ 402	295				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
Unalloyed case hardened steels	≤ 25	≤ 255	425				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
Alloyed case hardened steels	≤ 32	≤ 301	360				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
	≤ 43	≤ 402	230				0.0065	0.0065	0.0080	0.0100	0.0125	0.0125	0.0155
Nitriding steels	≤ 32	≤ 301	345				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
	≤ 43	≤ 402	230				0.0065	0.0065	0.0080	0.0100	0.0125	0.0125	0.0155
Tool steels	≤ 25	≤ 255	195				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
	≤ 43	≤ 402	180				0.0065	0.0065	0.0080	0.0100	0.0125	0.0125	0.0155
High speed steels	≤ 43	≤ 402	180				0.0050	0.0050	0.0065	0.0080	0.0100	0.0100	0.0125
Spring steels	≤ 38	≤ 354	165				0.0040	0.0040	0.0050	0.0065	0.0080	0.0080	0.0100
Hardened steels	≤ 48	≤ 460	80				0.0040	0.0040	0.0050	0.0065	0.0080	0.0080	0.0100
	≤ 66	-											
Stainless steels, sulphured	≤ 28	≤ 273	180				0.0050	0.0050	0.0065	0.0080	0.0100	0.0100	0.0125
austenitic	≤ 36	≤ 337	130				0.0050	0.0050	0.0065	0.0080	0.0100	0.0100	0.0125
martensitic	≤ 46	≤ 435	115				0.0050	0.0050	0.0065	0.0080	0.0100	0.0100	0.0125
Cast iron	≤ 23	≤ 242	330				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
	≤ 38	≤ 354	295				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
Spheroidal graphite iron and	≤ 23	≤ 242	395				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
malleable cast iron	≤ 38	≤ 354	330				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
Chilled cast iron	≤ 38	≤ 354	295				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
New cast materials GGV	≤ 20	≤ 220	260				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
	≤ 32	≤ 301	260				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
New cast materials ADI	≤ 32	≤ 301	260				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
	≤ 43	≤ 402	260				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195
Special alloys	≤ 54	≤ 549	80				0.0040	0.0040	0.0050	0.0065	0.0080	0.0080	0.0100
Ti and Ti-alloys	≤ 25	≤ 255	130				0.0050	0.0050	0.0065	0.0080	0.0100	0.0100	0.0125
	≤ 43	≤ 402	115				0.0040	0.0040	0.0050	0.0065	0.0080	0.0080	0.0100
Aluminum and Al-alloys	-	≤ 120	655				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
Al wrought alloys	-	≤ 200	590				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
Al cast alloys ≤ 10 % Si	-	≤ 180	490				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
> 10 % Si	-	≤ 180	395				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
Magnesium alloys	-	≤ 120	590				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
Copper, low-alloyed	-	≤ 150	230				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
Brass, short-chipping	-	≤ 180	590				0.0125	0.0125	0.0155	0.0195	0.0250	0.0250	0.0315
long-chipping	-	≤ 180	395				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
Bronze, short-chipping	-	≤ 180	230				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
	≤ 25	≤ 255	165				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
Bronze, long-chipping	≤ 25	≤ 255	150				0.0100	0.0100	0.0125	0.0155	0.0195	0.0195	0.0250
	≤ 32	≤ 301	115				0.0080	0.0080	0.0100	0.0125	0.0155	0.0155	0.0195

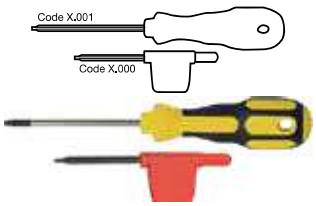
Clamping screws for HT 800 inserts

Series 4071



For body 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

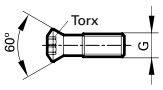
Screw driver Series 1612



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

Clamping screws for chamfering inserts

Series 6128



For body 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 Bits

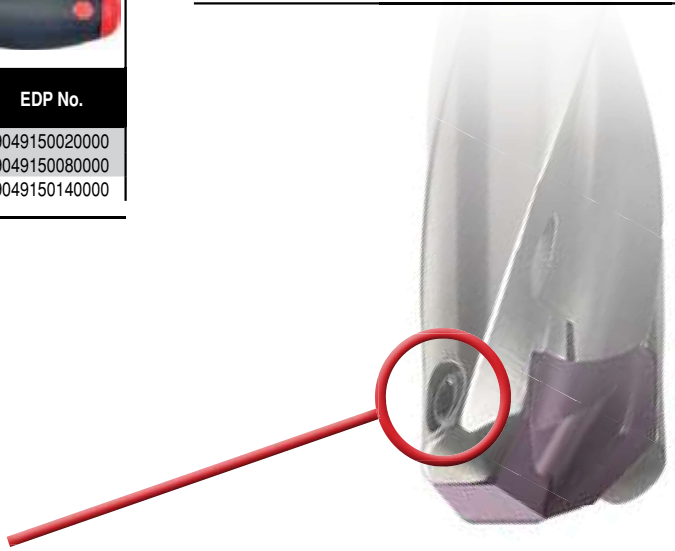
Series 4917

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 wrench

Series 4915

Type	Drive	l1 mm	Tightening torque (Nm)	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



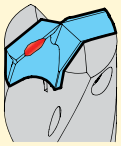
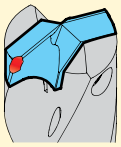
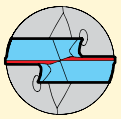
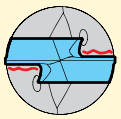
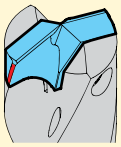
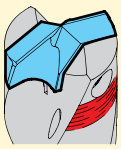
Torque values for clamping screws

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 - 29.99	30.0 - 40.00
Thread	M2.2	M2.5	M3	M3.5	M4	M4.5	M5	M6
Torx size	T7	T8	T9	T10	T15	T15	T20	T25
Tightening torque [Nm]	**0.80**	**1.00**	**1.70**	**2.70**	**4.00**	**6.0**	**8.00**	**14.0**

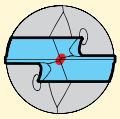
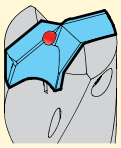
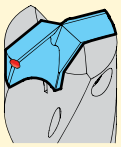
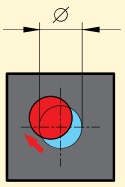
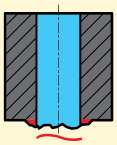
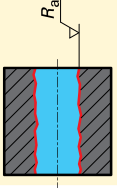
The information above applies to screws containing thread locker (Loctite). Guhring HT800 drill tip insert screws are supplied containing thread locker.

Bodies are supplied with clamping screw, series 4071, and screwdriver, series 1612.

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 not flat	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

With the HT 800 WP replaceable tip drilling system Guhring provides high-performance and cost-efficient drilling options for holes with a diameter range of 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 application-specific, precision-ground cutting edge geometries and coatings, the interchangeable inserts of the HT 800 WP drilling system are especially wear resistant.
The hardened tool steel and nickel-plated surface treatment utilized during the manufacturing process for the drill bodies, combined with incremental body sizes in steps of 0.5mm up to 31.99mm diameter and 1.0mm above 32.00mm diameter, results in optimal wear resistance on the drill bodies as well.

B Effective chip evacuation

The optimized flute geometry of the drill bodies results in outstanding chip evacuation capabilities, even while drilling deeper holes.

C Optimal cooling and lubrication

Optimal cooling and lubrication is applied through coolant ducts which exit into the flutes and directly onto the cutting edge, resulting in longer tool life and better chip evacuation.

D Highly accurate and rigid insert seat

The precise and easily accessible insert seat allows the insert to be changed while the drill remains in the machine spindle. Due to the unique clamping design, the insert can be changed more times than with competitors' systems before the body needs to be replaced due fatigue of the insert seat. The heavy-duty Torx clamping screws containing thread locker ensure secure clamping of the inserts, even during applications subject to high levels of vibration.

Rigid drill bodies

The small incremental diameter transitions of the drill bodies provide additional benefits other than simply reducing wear on the bodies. Due to the improved guidance and stabilization from margin contact while drilling, the rigidity is also increased, resulting in longer tool life and improved workpiece finishes.