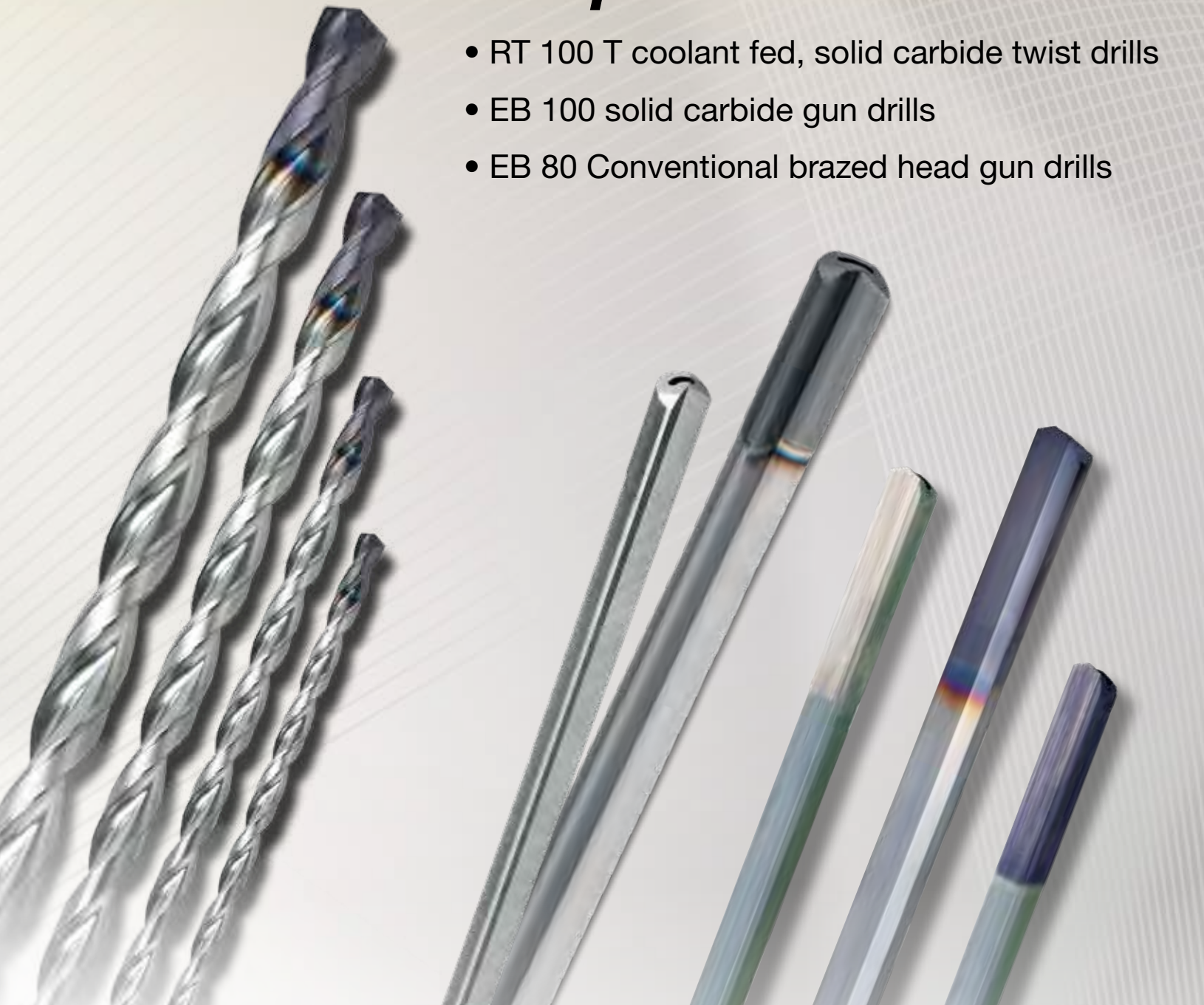


GUHRING

Deep Hole Solutions

- RT 100 T coolant fed, solid carbide twist drills
- EB 100 solid carbide gun drills
- EB 80 Conventional brazed head gun drills



Deep Hole Drills

GUHRING – YOUR WORLDWIDE PARTNER

RT 100 T - High penetration rate drilling

- 3 to 5 times the penetration rate of gun drills or cobalt deep hole drills
- Eliminates peck cycles
- Reduces cycle times and increases production



Maximized coolant duct profile for effective cooling and lubrication combined with optimized flute geometry for optimal chip evacuation.

Optimized flute geometry

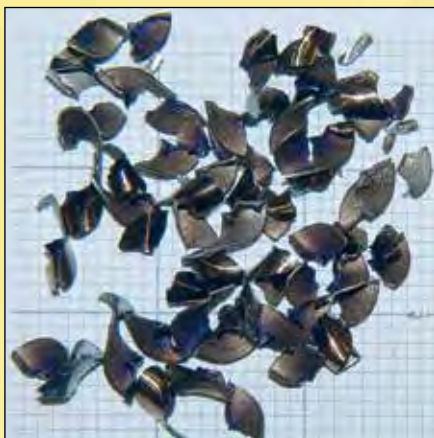
These spiral-flute deep hole carbide drills possess an advanced flute geometry designed for optimal chip evacuation from deep holes in a wide range of materials.

Maximized coolant duct profile

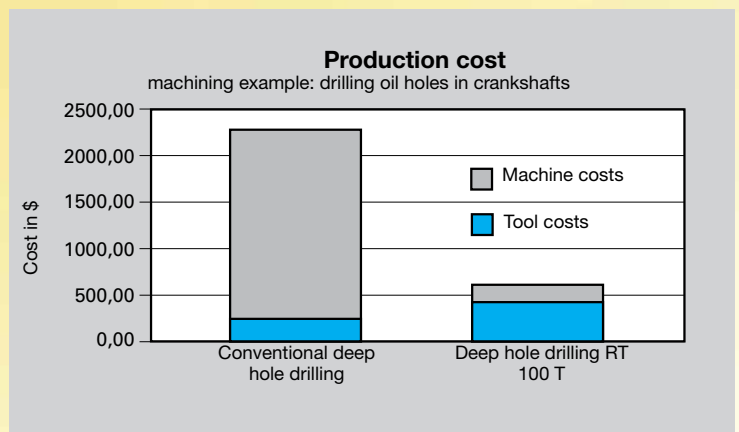
To provide the cutting edge with an optimum coolant supply, the tools possess a maximized coolant duct profile. It ensures an efficient coolant supply to the cutting edge as well as excellent chip evacuation.

Problem-free chips

The design features of this drill – with the appropriate cutting parameters – result in chips that are evacuated problem-free even from deep holes. Chip packing and a subsequent binding of the tool is effectively prevented.



Short, problem-free chips preventing chip congestion and binding of the tool.



Ultimate cost-efficiency:

Applied on machining centers, where the drilling operation is a time-relevant criterion, RT 100 T can display its superiority. Its high feed rates lead to a shorter production time, its long tool life reduces the number of tool changes.



EB 100 M - Ratio length gun drill

- Single-piece construction w/ solid carbide flute and shank
- Precision hole making
- Extra deep hole drilling on CNC equipment
- MQL shank end

The best of both worlds

EB 100 M gun drills are a single flute tool designed to drill extra deep holes on conventional CNC machining centers without the need for specialized gun drill equipment. Drilling depths of over 75xD can be reached with Guhring's EB 100 M CNC style gun drill.

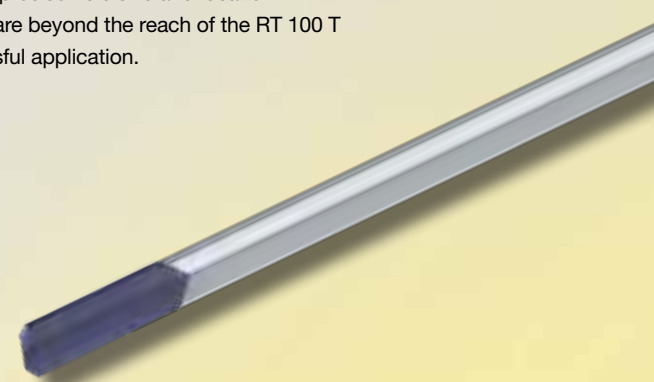
An excellent job shop selection

These precision deep hole drills have one-piece solid carbide construction from the shank to the cutting edge. The nano-A™ coated point improves abrasion- and heat-resistance at the cutting edge. The specialized point grind is a universal design that is well suited to the job shop environment.

Performance matters

Solid carbide construction improves rigidity during operation and results in extremely precise hole size and location. EB 100 gun drills do not require peck cycles. They are best suited for hole depths that are beyond the reach of the RT 100 T twist drill. Gun drilling operations must utilize a pilot hole or guide bushing for successful application.

EB 80 - Conventional Gun Drills

- Brazed carbide head construction
 - Single flute design
 - TiCN coated head
- 

Maximum drilling depths

Designed for maximum drilling depths, Guhring conventional gun drills are brazed carbide head gun drills that allow manufacturers to achieve precision holes in a wide variety of materials. These gun drills are typically used for precise drilling of deep holes when conventional style drills cannot be employed.

Wide range of stocked standards; special designs available

Conventional gun drills provide excellent surface finish quality and hole concentricity when properly applied. All gun drilling operations must utilize a pilot hole (conventional machines) or guide bushings (gun drilling machines) to operate successfully. Guhring offers a wide range of sizes with the series 5641 (40xD) and 5642 (80xD) highlighted in this brochure. Can't find the size your looking for? Contact Guhring for a special design to meet your unique requirements.





















ISO code

P	Steel, high-alloyed steel
M	Stainless steel
K	Grey cast iron, spher, graphite/mall. cast iron
N	Aluminum and other non-ferrous metals
S	Special, super and titanium alloys
H	Hardened steel and chilled cast iron

On the following tool selection pages you will find recommendations regarding application suitability based on material groups for every tool.

- = Optimal
- = Secondary

Pictograms

Tool material	Carbide
Cutting depth	          
Tolerance on Ø	 
Shank form	 straight
Cutting direction	 right
Internal coolant	
Point angle	
Type	  

Coatings

- bright
- A** TiAlN
- a** nano-A™
- C** TiCN

	Material group	Examples
P	Common structural steels	A283, A516, Gr50, 30, 35, 42, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 100, 110, 135, 140, 145, 150, 160
	Free-cutting steels	1151, 1215, L10, 10L10, 10L15, 10L17, 10L20, 10L23, 10L25, 10L30, 10L35, 10L40, 10L42, 10L45, 10L49, 10L50, 10L55, 11L15, 11L16, 11L17, 11L37, 11L38, 11L39, 11L41, 11L44, 11L46, 12L11, 12L12, 12L13, 12L14, 12L15, 41L25, 41L30, 41L35, 41L40, 41L42, 41L47, 41L50 51L15, 51L17, 51L20, 86L20, 86L40
	Unalloyed heat-treatable steels	1005, 1006, 1008, 1009, 1010, 1011, 1012, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1025, 1026, 1029, 1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1059, 1060, 1064, 1065, 1069, 1070, 1071, 1074, 1075, 1078, 1080, 1084, 1085, 1086, 1090, 1095
	Alloyed heat-treatable steels	1330, 1335, 1340, 1345, 2340, 3140, 3145, 3150, 3230, 3240, 3335, 3340, 3435, 3450, 4032, 4037, 4063, 4130, 4135, 4137, 4140, 4142, 4145, 4147, 4150, 4161, 4337, 4340, 4640, 5045, 5046, 5060, 5130, 5132, 5135, 5140, 5145, 5157, 5150, 5155, 5160, 6130, 6135, 6140, 6145, 6150, 7140, 6145, 6150, 7140, 8630, 8632, 8635, 8637, 8640, 8642, 8645, 8650, 8650, 8660, 8735, 8740, 8742, 9250, 9254, 9255, 9260, 9262, 9840, 9850
	Unalloyed case hardened steels	1005, 1006, 1008, 1009, 1010, 1011, 1012, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1025, 1026, 1029, 1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1059, 1060, 1064, 1065, 1069, 1070, 1071, 1074, 1075, 1078, 1080, 1084, 1085, 1086, 1090, 1095
	Alloyed case hardened steels	2317, 2512, 2515, 2517, 3115, 3120, 3215, 3220, 3312, 3316, 3325, 4012, 4023, 4024, 4027, 4028, 4118, 4119, 4125, 4317, 4320, 4419, 4422, 4427, 4608, 4615, 4617, 4620, 4621, 4626, 4718, 4720, 4815, 4817, 4820, 5015, 5115, 5117, 5120, 6115, 6118, 6120, 6125, 8115, 8615, 8617, 8620, 8622, 8625, 8627, 8720, 8822, 9310, 9315, 9317
	Nitriding steels	1132, 1137, 1138, 1139, 1140, 1141, 1144, 1145, 1146, 1151
	Tool steels	A2, A3, A4, A5, A6, A8, A9, A10, O1, O2, O6, O7, A7, D2, D3, D4, D5, D7, H10, H11, H12, H13, H14, H19, H20, H21, H22, H23, H24, H25, H26, H41, H42, H43, L1, L3, W1, W2, W5
	High speed steels	M1, M2, M3-1, M3-2, M4, M6, M7, M10, M30, M33, M34, M36, M41, M42, M43, M44, M46, M47, T1, T2, T4, T5, T6, T8, T15
	Spring steels	5150, 5155, 6145, 6150, 9255
H	Hardened steels >48-60 Rc	Heat Treated Steels
M	Stainless steels, sulphured	203 Ez, 303 Se, 303 Ma, 303 Pb, 303 PlusX, 430F Se, 416 Se, 416 PlusX, 420F, 420F Se, 440F, 440F Se
	austenitic	201, 202, 301, 302B, 303, 304, 304L, 305, 308, 309, 309S, 310, 310S, 314, 316, 316L, 317, 321, 330, 347, 348, 384, 385, Nitronic 32, Nitronic 33, Nitronic 40, Nitronic 50, Nitronic 60, 17-7PH
	martensitic	403, 405, 410, 414, 416, 420, 422, 430, 431, 440A, 440B, 440C, 446, 501, 502, 630, Greek Ascology
K	Cast iron	A48-20 B, A48-30 B, A48-40 B, A48-50B, A159G1800, A159G2500, A159G3000, A159G3500, A159G4000
	Spheroidal graphite iron and malleable cast iron	60-10-18, 60-40-18, 65-45-12, 80-55-06, 100-70-03, 120-90-02, 32510, 35018, 40010, 50005, 60004, 70003, 80002, 90001, A220-70003, A220-8002, A536
	Chilled cast iron	
S	Special alloys	Inconel, Hastelloy, Monel, Nimonic, MAR-M246, DS-Ni, Waspalloy, Rene41
	Ti and Ti-alloys	Ti6AL4V, 5390A, TiCu2
N	Aluminium and Al-alloys	EC 1060, 1100, 1145, 1175, 1235, 2011, 2014, 2017, 2018, 2021, 2024, 2025, 2117, 2218, 2219, 2618, 3003, 3004, 3005, 4032, 4032-T6, 5005, 5050, 5052, 5056, 5083, 5086, 5154, 5252, 5254, 5454, 5456, 5457, 5652, 5657, 6053, 6061, 6061-T6, 6063, 6066, 6070, 6101, 6151, 6253, 6262, 6463, 6951, 7001, 7004, 7005, 7039, 7049, 7050, 7075, 7075-T6, 7079, 7175, 7178
	Al wrought alloys	1100-0, 3003-H18, 5056-0, 2024-T4, 4043-H18
	Al cast alloys	295-T6, 319-F, 356-T6, 380-F, 384-F, 390-F, 443-F, 413-F, 518-F, 713-TS, 850-TS
	Magnesium alloys	AZ31B, AZ63A, AZ80A, AZ91C, EZ33A, HK31A, QE22A, ZK60A
	Copper, low-alloyed	C10100, C27000, C71500, C52400, C77000, C17200, C71500, C95500, C86500
	Brass, short-chipping	CUZn10, CUZn20





















GUHRING

IN-HOUSE TOOL RECONDITIONING





































Utilizing the same high-precision CNC grinding machines that are used in Guhring's manufacturing plants, our Reconditioning Division is well equipped to restore standard and special carbide and PCD tooling to its original factory quality, condition and performance. High precision remanufacturing delivers longer reground tool life and often more regrinds per tool, resulting in significant cost savings in terms of both tooling and machining expenses. Guhring is able to provide factory reconditioning for our own drills, step drills, carbide end mills, and reamers. We can provide the same high-quality service for competitors' tooling as well.



Carbide Twist Drills

P	M	K	N	S	H	Tool illustration	Cutting Depth	Coolant	Shank form	Tool material	Coating	Diameter (mm)	Series no.	Page	Cutting data page
•	•	•	○	○	○		15xD			Carbide		3.000 - 16.000	6509	8	24
•	•	•	○	○	○		20xD			Carbide		3.000 - 16.000	6511	9	24
•	•	•	○	○	○		25xD			Carbide		3.000 - 16.000	6512	10	25
•	•	•	○	○	○		30xD			Carbide		3.000 - 14.000	6513	11	25
•	•	•	○	○	○		40xD			Carbide		3.000 - 10.000	6514	12	26

Gun Drills

P	M	K	N	S	H	Tool illustration	Cutting Depth	Coolant	Shank form	Tool material	Coating	Diameter (mm)	Series no.	Page	Cutting data page
•	•	○	○	○	○		25xD			Carbide		1.000 - 16.000	5646	13	26
•	•	○	○	○	○		50xD			Carbide		1.000 - 10.000	5647	14	26
•	•	○	○	○	○		75xD			Carbide		1.000 - 7.140	5648	15	26
○	○	○	•	•	○		45mm			Carbide		0.900 - 3.200	5024	16	26
○	○	○	•	•	○		80mm			Carbide		1.000 - 5.000	5020	17	26
○	○	○	•	•	○		120 mm			Carbide		1.500 - 5.000	5026	18	26
○	○	○	•	•	○		160 mm			Carbide		1.500 - 8.000	5021	19	26
○	•	○	○	•	○		40xD			Carbide		3.970 - 12.700	5641	20	27
○	•	○	○	•	○		80xD			Carbide		4.950 - 12.650	5642	21	27

RT 100 T deep hole drills - 15xD

Series no.

6509



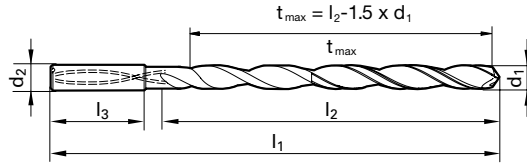
Tool material **Solid Carbide**

Surface **A**

- | | | |
|--------------------------|---|--|
| P Steel | • | double margin • web thinning $\geq \varnothing 3.000$ • relieved cone • main cutting edge form concave • optimized flute design • maximum diameter of coolant ducts • observe coolant pressure |
| M Stainless steel | • | |
| K Cast iron | • | structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm ² • stainless steels • cast materials |
| N Aluminum | ○ | |
| S Titanium alloys | ○ | |
| H Hardened steel | ○ | |

•=Optimal
○=Secondary

See page 22 for technical operation info
Speeds and feeds information on pg. 24

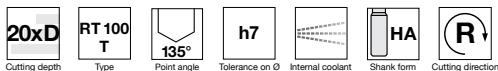


Diameter (d1)		d2	l1	t _{max}	l2	EDP #
inch	wire/ltr	mm	mm	mm	mm	
0.1181		3.000	6.00	95.00	50.50	9065090030000
0.1220		3.100	6.00	106.00	62.35	9065090031000
0.1248	1/8	3.170	6.00	106.00	62.25	9065090031700
0.1260		3.200	6.00	106.00	62.20	9065090032000
0.1299		3.300	6.00	106.00	62.05	9065090033000
0.1378		3.500	6.00	116.00	70.75	9065090035000
0.1406	9/64 #28	3.570	6.00	116.00	70.65	9065090035700
0.1457		3.700	6.00	116.00	70.45	9065090037000
0.1496		3.800	6.00	116.00	70.30	9065090038000
0.1563	5/32	3.970	6.00	116.00	70.05	9065090039700
0.1575		4.000	6.00	116.00	70.00	9065090040000
0.1654		4.200	6.00	133.00	86.70	9065090042000
0.1693		4.300	6.00	133.00	86.55	9065090043000
0.1720	11/64	4.370	6.00	133.00	86.45	9065090043700
0.1772		4.500	6.00	133.00	86.25	9065090045000
0.1811		4.600	6.00	133.00	86.10	9065090046000
0.1874	3/16	4.760	6.00	133.00	85.86	9065090047600
0.1890	#12	4.800	6.00	133.00	85.80	9065090048000
0.1969		5.000	6.00	133.00	85.50	9065090050000
0.2008		5.100	6.00	150.00	102.35	9065090051000
0.2031	13/64	5.160	6.00	150.00	102.26	9065090051600
0.2130		5.410	6.00	150.00	101.89	9065090054100
0.2165		5.500	6.00	150.00	101.75	9065090055000
0.2189	7/32	5.560	6.00	150.00	101.66	9065090055600
0.2205		5.600	6.00	150.00	101.60	9065090056000
0.2283		5.800	6.00	150.00	101.30	9065090058000
0.2343	15/64	5.950	6.00	150.00	101.08	9065090059500
0.2362		6.000	6.00	150.00	101.00	9065090060000
0.2480		6.300	8.00	167.00	117.55	9065090063000
0.2500	1/4 E	6.350	8.00	167.00	117.48	9065090063500
0.2559		6.500	8.00	167.00	117.25	9065090065000
0.2657	17/64 H	6.750	8.00	167.00	116.88	9065090067500
0.2677		6.800	8.00	167.00	116.80	9065090068000
0.2756		7.000	8.00	167.00	116.50	9065090070000
0.2811	9/32 K	7.140	8.00	183.00	132.29	9065090071400
0.2953		7.500	8.00	183.00	131.75	9065090075000
0.2969	19/64	7.540	8.00	183.00	131.69	9065090075400

Diameter (d1)		d2	l1	t _{max}	l2	EDP #
inch	wire/ltr	mm	mm	mm	mm	
0.3071		7.800	8.00	183.00	131.30	9065090078000
0.3126	5/16	7.940	8.00	183.00	131.09	9065090079400
0.3150		8.000	8.00	183.00	131.00	9065090080000
0.3280	21/64	8.330	10.00	204.00	147.51	9065090083300
0.3346		8.500	10.00	204.00	147.25	9065090085000
0.3437	11/32	8.730	10.00	204.00	146.91	9065090087300
0.3465		8.800	10.00	204.00	146.80	9065090088000
0.3543		9.000	10.00	204.00	146.50	9065090090000
0.3594	23/64	9.130	10.00	221.00	163.31	9065090091300
0.3740		9.500	10.00	221.00	162.75	9065090095000
0.3748	3/8	9.520	10.00	221.00	162.72	9065090095200
0.3858		9.800	10.00	221.00	162.30	9065090098000
0.3906	25/64	9.920	10.00	221.00	162.12	9065090099200
0.3937		10.000	10.00	221.00	162.00	9065090100000
0.4016		10.200	12.00	247.00	182.70	9065090102000
0.4063	13/32	10.320	12.00	247.00	182.52	9065090103200
0.4134		10.500	12.00	247.00	182.25	9065090105000
0.4220	27/64	10.720	12.00	247.00	181.92	9065090107200
0.4331		11.000	12.00	247.00	181.50	9065090110000
0.4374	7/16	11.110	12.00	263.00	197.34	9065090111100
0.4531	29/64	11.510	12.00	263.00	196.74	9065090115100
0.4646		11.800	12.00	263.00	196.30	9065090118000
0.4689	15/32	11.910	12.00	263.00	196.14	9065090119100
0.4724		12.000	12.00	263.00	196.00	9065090120000
0.4843	31/64	12.300	14.00	297.00	229.55	9065090123000
0.4921		12.500	14.00	297.00	229.25	9065090125000
0.5000	1/2	12.700	14.00	297.00	228.95	9065090127000
0.5118		13.000	14.00	297.00	228.50	9065090130000
0.5157	33/64	13.100	14.00	297.00	228.35	9065090131000
0.5311	17/32	13.490	14.00	297.00	227.77	9065090134900
0.5469	35/64	13.890	14.00	297.00	227.17	9065090138900
0.5512		14.000	14.00	297.00	227.00	9065090140000
0.5626	0.5625	14.290	16.00	333.00	259.57	9065090142900
0.5906		15.000	16.00	333.00	258.50	9065090150000
0.6248	0.625	15.870	16.00	333.00	257.20	9065090158700
0.6299		16.000	16.00	333.00	257.00	9065090160000

RT 100 T deep hole drills - 20xD

Series no. **6511**

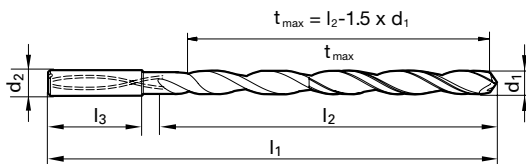


Tool material **Solid Carbide**

Surface **A**

- P** Steel ● double margin • web thinning $\geq \varnothing 3.000$ • relieved cone • main cutting edge form concave • optimized flute design • maximum diameter of coolant ducts • observe coolant pressure
 - M** Stainless steel ●
 - K** Cast iron ● structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
 - N** Aluminum ○
 - S** Titanium alloys ○
 - H** Hardened steel ○
- =Optimal
○=Secondary

See page 22 for technical operation info
Speeds and feeds information on pg. 24



Diameter (d1)			d2	l1	t _{max}	l2	EDP #
inch	wire/ltr	mm	mm	mm	mm	mm	
0.1181		3.000	6.00	110.00	65.50	70.00	9065110030000
0.1220		3.100	6.00	123.00	78.35	83.00	9065110031000
0.1248	1/8	3.170	6.00	123.00	78.25	83.00	9065110031700
0.1260		3.200	6.00	123.00	78.20	83.00	9065110032000
0.1299		3.300	6.00	123.00	78.05	83.00	9065110033000
0.1378		3.500	6.00	136.00	90.75	96.00	9065110035000
0.1406	9/64 #28	3.570	6.00	136.00	90.65	96.00	9065110035700
0.1457		3.700	6.00	136.00	90.45	96.00	9065110037000
0.1496		3.800	6.00	136.00	90.30	96.00	9065110038000
0.1563	5/32	3.970	6.00	136.00	90.05	96.00	9065110039700
0.1575		4.000	6.00	136.00	90.00	96.00	9065110040000
0.1654		4.200	6.00	158.00	111.70	118.00	9065110042000
0.1693		4.300	6.00	158.00	111.55	118.00	9065110043000
0.1720	11/64	4.370	6.00	158.00	111.45	118.00	9065110043700
0.1772		4.500	6.00	158.00	111.25	118.00	9065110045000
0.1811		4.600	6.00	158.00	111.10	118.00	9065110046000
0.1874	3/16	4.760	6.00	158.00	110.86	118.00	9065110047600
0.1890	#12	4.800	6.00	158.00	110.80	118.00	9065110048000
0.1969		5.000	6.00	158.00	110.50	118.00	9065110050000
0.2008		5.100	6.00	180.00	132.35	140.00	9065110051000
0.2031	13/64	5.160	6.00	180.00	132.26	140.00	9065110051600
0.2130	#3	5.410	6.00	180.00	131.89	140.00	9065110054100
0.2165		5.500	6.00	180.00	131.75	140.00	9065110055000
0.2189	7/32	5.560	6.00	180.00	131.66	140.00	9065110055600
0.2283		5.800	6.00	180.00	131.30	140.00	9065110058000
0.2343	15/64	5.950	6.00	180.00	131.08	140.00	9065110059500
0.2362		6.000	6.00	180.00	131.00	140.00	9065110060000
0.2500	1/4 E	6.350	8.00	202.00	152.48	162.00	9065110063500
0.2559		6.500	8.00	202.00	152.25	162.00	9065110065000
0.2657	17/64 H	6.750	8.00	202.00	151.88	162.00	9065110067500
0.2677		6.800	8.00	202.00	151.80	162.00	9065110068000
0.2756		7.000	8.00	202.00	151.50	162.00	9065110070000
0.2811	9/32 K	7.140	8.00	223.00	172.29	183.00	9065110071400
0.2953		7.500	8.00	223.00	171.75	183.00	9065110075000
0.2969	19/64	7.540	8.00	223.00	171.69	183.00	9065110075400

Diameter (d1)			d2	l1	t _{max}	l2	EDP #
inch	wire/ltr	mm	mm	mm	mm	mm	
0.3071		7.800	8.00	223.00	171.30	183.00	9065110078000
0.3126	5/16	7.940	8.00	223.00	171.09	183.00	9065110079400
0.3150		8.000	8.00	223.00	171.00	183.00	9065110080000
0.3280	21/64	8.330	10.00	249.00	192.51	205.00	9065110083300
0.3346		8.500	10.00	249.00	192.25	205.00	9065110085000
0.3437	11/32	8.730	10.00	249.00	191.91	205.00	9065110087300
0.3465		8.800	10.00	249.00	191.80	205.00	9065110088000
0.3543		9.000	10.00	249.00	191.50	205.00	9065110090000
0.3594	23/64	9.130	10.00	271.00	213.31	227.00	9065110091300
0.3748	3/8	9.520	10.00	271.00	212.72	227.00	9065110095200
0.3906	25/64	9.920	10.00	271.00	212.12	227.00	9065110099200
0.3937		10.000	10.00	271.00	212.00	227.00	9065110100000
0.4016		10.200	12.00	302.00	237.70	253.00	9065110102000
0.4063	13/32	10.320	12.00	302.00	237.52	253.00	9065110103200
0.4134		10.500	12.00	302.00	237.25	253.00	9065110105000
0.4220	27/64	10.720	12.00	302.00	236.92	253.00	9065110107200
0.4330		11.000	12.00	302.00	236.50	253.00	9065110110000
0.4374	7/16	11.110	12.00	323.00	257.34	274.00	9065110111100
0.4531	29/64	11.510	12.00	323.00	256.74	274.00	9065110115100
0.4646		11.800	12.00	323.00	256.30	274.00	9065110118000
0.4689	15/32	11.910	12.00	323.00	256.14	274.00	9065110119100
0.4724		12.000	12.00	323.00	256.00	274.00	9065110120000
0.4843	31/64	12.300	14.00	367.00	299.55	318.00	9065110123000
0.4921		12.500	14.00	367.00	299.25	318.00	9065110125000
0.5000	1/2	12.700	14.00	367.00	298.95	318.00	9065110127000
0.5118		13.000	14.00	367.00	298.50	318.00	9065110130000
0.5157	33/64	13.100	14.00	367.00	298.35	318.00	9065110131000
0.5311	17/32	13.490	14.00	367.00	297.77	318.00	9065110134900
0.5469	35/64	13.890	14.00	367.00	297.17	318.00	9065110138900
0.5512		14.000	14.00	367.00	297.00	318.00	9065110140000
0.5626	0.5625	14.290	16.00	413.00	339.57	361.00	9065110142900
0.5906		15.000	16.00	413.00	338.50	361.00	9065110150000
0.6248	0.625	15.870	16.00	413.00	337.20	361.00	9065110158700
0.6299		16.000	16.00	413.00	337.00	361.00	9065110160000

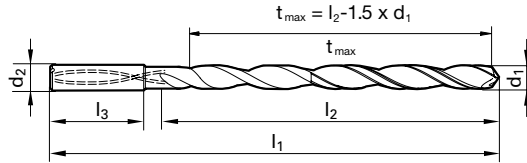


Tool material **Solid Carbide**

Surface **A**

- | | | |
|--------------------------|---|--|
| P Steel | ● | double margin • web thinning $\geq \varnothing 3.000$ • relieved cone • main cutting edge form concave • optimized flute design • maximum diameter of coolant ducts • observe coolant pressure |
| M Stainless steel | ● | |
| K Cast iron | ● | structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm ² • stainless steels • cast materials |
| N Aluminum | ○ | |
| S Titanium alloys | ○ | |
| H Hardened steel | ○ | |
- =Optimal
○=Secondary

See page 22 for technical operation info
Speeds and feeds information on pg. 25

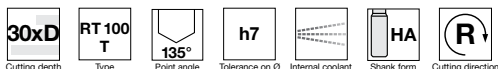


Diameter (d1)			d2 mm	l1 mm	t _{max} mm	l2 mm	EDP #
inch	wire/ltr	mm					
0.1181		3.00	6.00	125.00	80.50	85.00	9065120030000
0.1220		3.10	6.00	141.00	96.35	101.00	9065120031000
0.1248	1/8	3.18	6.00	141.00	96.23	101.00	9065120031700
0.1260		3.20	6.00	141.00	96.20	101.00	9065120032000
0.1299		3.30	6.00	141.00	96.05	101.00	9065120033000
0.1378		3.50	6.00	156.00	110.75	116.00	9065120035000
0.1406	9/64 #28	3.57	6.00	156.00	110.65	116.00	9065120035700
0.1457		3.70	6.00	156.00	110.45	116.00	9065120037000
0.1496		3.80	6.00	156.00	110.30	116.00	9065120038000
0.1563	5/32	3.97	6.00	156.00	110.05	116.00	9065120039700
0.1575		4.00	6.00	156.00	110.00	116.00	9065120040000
0.1654		4.20	6.00	183.00	136.70	143.00	9065120042000
0.1693		4.30	6.00	183.00	136.55	143.00	9065120043000
0.1720	11/64	4.37	6.00	183.00	136.45	143.00	9065120043700
0.1772		4.50	6.00	183.00	136.25	143.00	9065120045000
0.1811		4.60	6.00	183.00	136.10	143.00	9065120046000
0.1874	3/16	4.76	6.00	183.00	135.86	143.00	9065120047600
0.1890	#12	4.80	6.00	183.00	135.80	143.00	9065120048000
0.1969		5.00	6.00	183.00	135.50	143.00	9065120050000
0.2008		5.10	6.00	210.00	162.35	170.00	9065120051000
0.2031	13/64	5.16	6.00	210.00	162.26	170.00	9065120051600
0.2130	#3	5.41	6.00	210.00	161.89	170.00	9065120054100
0.2165		5.50	6.00	210.00	161.75	170.00	9065120055000
0.2189	7/32	5.56	6.00	210.00	161.66	170.00	9065120055600
0.2283		5.80	6.00	210.00	161.30	170.00	9065120058000
0.2343	15/64	5.95	6.00	210.00	161.08	170.00	9065120059500
0.2362		6.00	6.00	210.00	161.00	170.00	9065120060000
0.2480		6.30	8.00	237.00	187.55	197.00	9065120063000
0.2500	1/4 E	6.35	8.00	237.00	187.48	197.00	9065120063500
0.2559		6.50	8.00	237.00	187.25	197.00	9065120065000
0.2657	17/64 H	6.75	8.00	237.00	186.88	197.00	9065120067500
0.2677		6.80	8.00	237.00	186.80	197.00	9065120068000
0.2756		7.00	8.00	237.00	186.50	197.00	9065120070000

Diameter (d1)			d2 mm	l1 mm	t _{max} mm	l2 mm	EDP #
inch	wire/ltr	mm					
0.2811	9/32 K	7.14	8.00	263.00	212.29	223.00	9065120071400
0.2953		7.50	8.00	263.00	211.75	223.00	9065120075000
0.2969	19/64	7.54	8.00	263.00	211.69	223.00	9065120075400
0.3125	5/16	7.94	8.00	263.00	211.09	223.00	9065120079400
0.3150		8.00	8.00	263.00	211.00	223.00	9065120080000
0.3280	21/64	8.33	10.00	294.00	237.51	250.00	9065120083300
0.3346		8.50	10.00	294.00	237.25	250.00	9065120085000
0.3437	11/32	8.73	10.00	294.00	236.91	250.00	9065120087300
0.3465		8.80	10.00	294.00	236.80	250.00	9065120088000
0.3543		9.00	10.00	294.00	236.50	250.00	9065120090000
0.3594	23/64	9.13	10.00	321.00	263.31	277.00	9065120091300
0.3750	3/8	9.52	10.00	321.00	262.72	277.00	9065120095200
0.3906	25/64	9.92	10.00	321.00	262.12	277.00	9065120099200
0.3937		10.00	10.00	321.00	262.00	277.00	9065120100000
0.4063	13/32	10.32	12.00	359.00	294.52	310.00	9065120103200
0.4220	27/64	10.72	12.00	359.00	293.92	310.00	9065120107200
0.4331		11.00	12.00	359.00	293.50	310.00	9065120110000
0.4374	7/16	11.11	12.00	386.00	320.34	337.00	9065120111100
0.4531	29/64	11.51	12.00	386.00	319.74	337.00	9065120115100
0.4689	15/32	11.91	12.00	386.00	319.14	337.00	9065120119100
0.4724		12.00	12.00	386.00	319.00	337.00	9065120120000
0.4843		12.30	14.00	437.00	369.55	388.00	9065120123000
0.5000		12.70	14.00	437.00	368.95	388.00	9065120127000
0.5118		13.00	14.00	437.00	368.50	388.00	9065120130000
0.5157		13.10	14.00	437.00	368.35	388.00	9065120131000
0.5311	17/32	13.49	14.00	437.00	367.77	388.00	9065120134900
0.5469	35/64	13.89	14.00	437.00	367.17	388.00	9065120138900
0.5512		14.00	14.00	437.00	367.00	388.00	9065120140000
0.5626	9/16	14.29	16.00	493.00	419.57	441.00	9065120142900
0.5906		15.00	16.00	493.00	418.50	441.00	9065120150000
0.6248	5/8	15.87	16.00	493.00	417.20	441.00	9065120158700
0.6299		16.00	16.00	493.00	417.00	441.00	9065120160000

RT 100 T deep hole drills - 30xD

Series no. **6513**

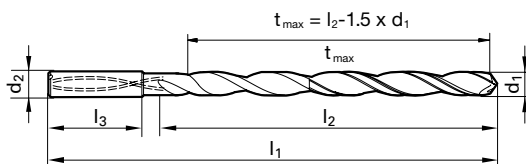


Tool material **Solid Carbide**

Surface **A**

- | | | |
|--------------------------|---|--|
| P Steel | ● | double margin • web thinning $\geq \varnothing 3.000$ • relieved cone • main cutting edge form concave • optimized flute design • maximum diameter of coolant ducts • observe coolant pressure |
| M Stainless steel | ● | |
| K Cast iron | ● | structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm ² • stainless steels • cast materials |
| N Aluminum | ○ | |
| S Titanium alloys | ○ | |
| H Hardened steel | ○ | |
- =Optimal
○=Secondary

See page 22 for technical operation info
Speeds and feeds information on pg. 25



Diameter (d1)			d2 mm	l1 mm	t _{max} mm	l2 mm	EDP #
inch	wire/ltr	mm					
0.1181		3.00	6.00	140.00	95.50	100.00	9065130030000
0.1220		3.10	6.00	158.00	113.35	118.00	9065130031000
0.1248	1/8	3.17	6.00	158.00	113.25	118.00	9065130031700
0.1260		3.20	6.00	158.00	113.20	118.00	9065130032000
0.1299		3.30	6.00	158.00	113.05	118.00	9065130033000
0.1378		3.50	6.00	176.00	130.75	136.00	9065130035000
0.1406	9/64 #28	3.57	6.00	176.00	130.65	136.00	9065130035700
0.1457		3.70	6.00	176.00	130.45	136.00	9065130037000
0.1496		3.80	6.00	176.00	130.30	136.00	9065130038000
0.1563	5/32	3.97	6.00	176.00	130.05	136.00	9065130039700
0.1575		4.00	6.00	176.00	130.00	136.00	9065130040000
0.1654		4.20	6.00	208.00	161.70	168.00	9065130042000
0.1720	11/64	4.37	6.00	208.00	161.45	168.00	9065130043700
0.1772		4.50	6.00	208.00	161.25	168.00	9065130045000
0.1874	3/16	4.76	6.00	208.00	160.86	168.00	9065130047600
0.1969		5.00	6.00	208.00	160.50	168.00	9065130050000
0.2008		5.10	6.00	240.00	192.35	200.00	9065130051000
0.2031	13/64	5.16	6.00	240.00	192.26	200.00	9065130051600
0.2130	#3	5.41	6.00	240.00	191.89	200.00	9065130054100
0.2165		5.50	6.00	240.00	191.75	200.00	9065130055000
0.2189	7/32	5.56	6.00	240.00	191.66	200.00	9065130055600
0.2343	15/64	5.95	6.00	240.00	191.08	200.00	9065130059500
0.2362		6.00	6.00	240.00	191.00	200.00	9065130060000
0.2480		6.30	8.00	272.00	222.55	232.00	9065130063000
0.2500	1/4 E	6.35	8.00	272.00	222.48	232.00	9065130063500
0.2559		6.50	8.00	272.00	222.25	232.00	9065130065000
0.2657	17/64 H	6.75	8.00	272.00	221.88	232.00	9065130067500
0.2677		6.80	8.00	272.00	221.80	232.00	9065130068000
0.2756		7.00	8.00	272.00	221.50	232.00	9065130070000

Diameter (d1)			d2 mm	l1 mm	t _{max} mm	l2 mm	EDP #
inch	wire/ltr	mm					
0.2811	9/32 K	7.14	8.00	303.00	252.29	263.00	9065130071400
0.2953		7.50	8.00	303.00	251.75	263.00	9065130075000
0.2969	19/64	7.54	8.00	303.00	251.69	263.00	9065130075400
0.3126	5/16	7.94	8.00	303.00	251.09	263.00	9065130079400
0.3150		8.00	8.00	303.00	251.00	263.00	9065130080000
0.3280	21/64	8.33	10.00	339.00	282.51	295.00	9065130083300
0.3346		8.50	10.00	339.00	282.25	295.00	9065130085000
0.3437	11/32	8.73	10.00	339.00	281.91	295.00	9065130087300
0.3465		8.80	10.00	339.00	281.80	295.00	9065130088000
0.3543		9.00	10.00	339.00	281.50	295.00	9065130090000
0.3594	23/64	9.13	10.00	371.00	313.31	327.00	9065130091300
0.3748	3/8	9.52	10.00	371.00	312.72	327.00	9065130095200
0.3906	25/64	9.92	10.00	371.00	312.12	327.00	9065130099200
0.3937		10.00	10.00	371.00	312.00	327.00	9065130100000
0.4063	13/32	10.32	12.00	412.00	347.52	363.00	9065130103200
0.4220	27/64	10.72	12.00	412.00	346.92	363.00	9065130107200
0.4331		11.00	12.00	412.00	346.50	363.00	9065130110000
0.4374	7/16	11.11	12.00	443.00	377.34	394.00	9065130111100
0.4531	29/64	11.51	12.00	443.00	376.74	394.00	9065130115100
0.4689	15/32	11.91	12.00	443.00	376.14	394.00	9065130119100
0.4724		12.00	12.00	443.00	376.00	394.00	9065130120000
0.4843		12.30	14.00	507.00	439.55	458.00	9065130123000
0.5000		12.70	14.00	507.00	438.95	458.00	9065130127000
0.5118		13.00	14.00	507.00	438.50	458.00	9065130130000
0.5157		13.10	14.00	507.00	438.35	458.00	9065130131000
0.5311	17/32	13.49	14.00	507.00	437.77	458.00	9065130134900
0.5469	35/64	13.89	14.00	507.00	437.17	458.00	9065130138900
0.5512		14.00	14.00	507.00	437.00	458.00	9065130140000

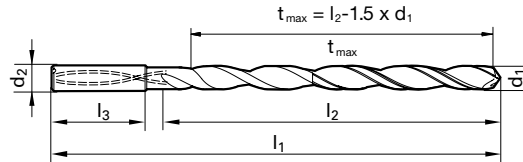


Tool material **Solid Carbide**

Surface **A**

- | | | | |
|----------|-----------------|---|--|
| P | Steel | ● | double margin • web thinning $\geq \varnothing 3.000$ • relieved cone • main cutting edge form concave • optimized flute design • maximum diameter of coolant ducts • observe coolant pressure |
| M | Stainless steel | ● | |
| K | Cast iron | ● | structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm ² • stainless steels • cast materials |
| N | Aluminum | ○ | |
| S | Titanium alloys | ○ | |
| H | Hardened steel | ○ | |
- =Optimal
○=Secondary

See page 22 for technical operation info
Speeds and feeds information on pg. 26

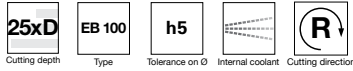


Diameter (d1)			d2 mm	l1 mm	t _{max} mm	l2 mm	EDP #
inch	wire/ltr	mm					
0.1181		3.00	6.00	170.00	125.50	130.00	9065140030000
0.1220		3.10	6.00	193.00	148.35	153.00	9065140031000
0.1248	1/8	3.17	6.00	193.00	148.25	153.00	9065140031700
0.1260		3.20	6.00	193.00	148.20	153.00	9065140032000
0.1299		3.30	6.00	193.00	148.05	153.00	9065140033000
0.1378		3.50	6.00	193.00	147.75	153.00	9065140035000
0.1406	9/64 #28	3.57	6.00	216.00	170.65	176.00	9065140035700
0.1496		3.80	6.00	216.00	170.30	176.00	9065140038000
0.1563	5/32	3.97	6.00	216.00	170.05	176.00	9065140039700
0.1575		4.00	6.00	216.00	170.00	176.00	9065140040000
0.1654		4.20	6.00	238.00	191.70	198.00	9065140042000
0.1720	11/64	4.37	6.00	238.00	191.45	198.00	9065140043700
0.1772		4.50	6.00	238.00	191.25	198.00	9065140045000
0.1874	3/16	4.76	6.00	258.00	210.86	218.00	9065140047600
0.1969		5.00	6.00	258.00	210.50	218.00	9065140050000
5.1000		5.10	6.00	280.00	232.35	240.00	9065140051000
0.2031	13/64	5.16	6.00	280.00	232.26	240.00	9065140051600
0.2129		5.41	6.00	280.00	231.89	240.00	9065140054100

Diameter (d1)			d2 mm	l1 mm	t _{max} mm	l2 mm	EDP #
inch	wire/ltr	mm					
0.2165		5.50	6.00	280.00	231.75	240.00	9065140055000
0.2189	7/32	5.56	6.00	300.00	251.66	260.00	9065140055600
0.2343	15/64	5.95	6.00	300.00	251.08	260.00	9065140059500
0.2362		6.00	6.00	300.00	251.00	260.00	9065140060000
0.2480		6.30	8.00	322.00	272.55	282.00	9065140063000
0.2500	1/4 E	6.35	8.00	322.00	272.48	282.00	9065140063500
0.2559		6.50	8.00	322.00	272.25	282.00	9065140065000
0.2657	17/64 H	6.75	8.00	342.00	291.88	302.00	9065140067500
0.2677		6.80	8.00	342.00	291.80	302.00	9065140068000
0.2756		7.00	8.00	342.00	291.50	302.00	9065140070000
0.2811	9/32 K	7.14	8.00	363.00	312.29	323.00	9065140071400
0.2953		7.50	8.00	363.00	311.75	323.00	9065140075000
0.2969	19/64	7.54	8.00	383.00	331.69	343.00	9065140075400
0.3120	5/16	7.94	8.00	383.00	331.09	343.00	9065140079400
0.3150		8.00	8.00	383.00	331.00	343.00	9065140080000
0.3346		8.50	10.00	409.00	352.25	365.00	9065140085000
0.3543		9.00	10.00	429.00	372.50	386.00	9065140090000
0.3937		10.00	10.00	471.00	412.00	427.00	9065140100000

EB 100 M solid carbide gun drills - 25xD

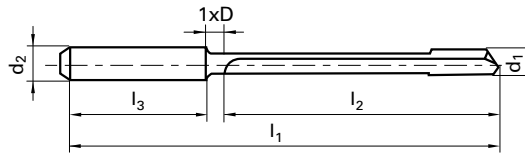
Series no. **5646**



Tool material **Solid Carbide**
Surface **a**

- P** Steel ● head form G • solid carbide shank with tapered MQL shank end from d1 = 3 mm / d2 = 6 mm
 - M** Stainless steel ●
 - K** Cast iron ○
 - N** Aluminum ○
 - S** Titanium alloys ○
 - H** Hardened steel ○
- =Optimal
○=Secondary

See page 23 for technical operation info
Speeds and feeds information on pg. 26



Diameter (d1)		mm	d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #
inch	wire/ltr							
0.0394		1.000	3.00	65.00	32.00	28.00	1.000	9056460010000
0.0469	3/64	1.191	3.00	70.00	39.00	28.00	1.190	9056460011900
0.0591		1.500	4.00	80.00	49.00	28.00	1.500	9056460015000
0.0625	1/16	1.588	4.00	85.00	51.00	28.00	1.590	9056460015900
0.0781	5/64	1.984	4.00	95.00	64.00	28.00	1.980	9056460019800
0.0787		2.000	4.00	95.00	65.00	28.00	2.000	9056460020000
0.0937	3/32	2.381	4.00	100.00	70.00	28.00	2.380	9056460023800
0.0984		2.500	4.00	115.00	85.00	28.00	2.500	9056460025000
0.1094	7/64	2.778	4.00	115.00	85.00	28.00	2.780	9056460027800
0.1181		3.000	6.00	145.00	105.00	36.00	3.000	9056460030000
0.1250	1/8	3.175	6.00	145.00	105.00	36.00	3.170	9056460031700
0.1378		3.500	6.00	145.00	105.00	36.00	3.500	9056460035000
0.1406	9/64	3.572	6.00	160.00	120.00	36.00	3.570	9056460035700
0.1563	5/32	3.969	6.00	160.00	120.00	36.00	3.970	9056460039700
0.1575		4.000	6.00	160.00	120.00	36.00	4.000	9056460040000
0.1719	11/64	4.366	6.00	220.00	180.00	36.00	4.370	9056460043700
0.1875	3/16	4.763	6.00	220.00	180.00	36.00	4.760	9056460047600
0.1969		5.000	6.00	220.00	180.00	36.00	5.000	9056460050000
0.2031	13/64	5.159	6.00	220.00	180.00	36.00	5.160	9056460051600
0.2187	7/32	5.556	6.00	220.00	180.00	36.00	5.560	9056460055600
0.2344	15/64	5.953	6.00	220.00	180.00	36.00	5.950	9056460059500
0.2362		6.000	6.00	220.00	180.00	36.00	6.000	9056460060000
0.2500	1/4	6.350	8.00	260.00	210.00	36.00	6.350	9056460063500
0.2559		6.500	8.00	260.00	210.00	36.00	6.500	9056460065000
0.2656	17/64	6.747	8.00	260.00	210.00	36.00	6.750	9056460067500
0.2756		7.000	8.00	260.00	210.00	36.00	7.000	9056460070000
0.2813	9/32	7.144	8.00	285.00	240.00	36.00	7.140	9056460071400
0.2969	19/64	7.541	8.00	285.00	240.00	36.00	7.540	9056460075400
0.3125	5/16	7.938	8.00	285.00	240.00	36.00	7.940	9056460079400
0.3150		8.000	8.00	285.00	240.00	36.00	8.000	9056460080000
0.3543		9.000	10.00	350.00	300.00	40.00	9.000	9056460090000
0.3937		10.000	10.00	350.00	300.00	40.00	10.000	9056460100000
0.4331		11.000	12.00	420.00	360.00	45.00	11.000	9056460110000
0.4375	7/16	11.113	12.00	420.00	360.00	45.00	11.113	9056460111130
0.4724		12.000	12.00	420.00	360.00	45.00	12.000	9056460120000
0.5000	1/2	12.700	14.00	455.00	396.00	45.00	12.700	9056460127000
0.5512		14.000	14.00	500.00	437.00	45.00	14.000	9056460140000
0.5906		15.000	16.00	535.00	468.00	48.00	15.000	9056460150000
0.6250	5/8	15.875	16.00	560.00	495.00	48.00	15.875	9056460158750
0.6299		16.000	16.00	565.00	499.00	48.00	16.000	9056460160000

EB 100 M solid carbide gun drills - 50xD

Series no. **5647**

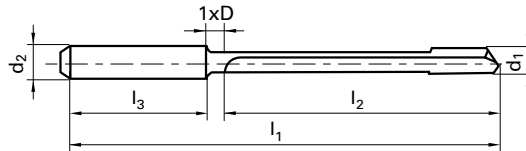


Tool material **Solid Carbide**

Surface

- | | | | |
|----------|-----------------|---|---|
| P | Steel | ● | head form G • solid carbide shank with tapered MQL shank end from d1 = 3 mm / d2 = 6 mm |
| M | Stainless steel | ● | |
| K | Cast iron | ○ | |
| N | Aluminum | ○ | |
| S | Titanium alloys | ○ | |
| H | Hardened steel | ○ | |
- =Optimal
○=Secondary

See page 23 for technical operation info
Speeds and feeds information on pg. 26



Diameter (d1)		mm	d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #
inch	wire/ltr							
0.0394		1.000	3.00	90.00	57.00	28.00	1.000	9056470010000
0.0469	3/64	1.191	3.00	100.00	68.00	28.00	1.190	9056470011900
0.0591		1.500	4.00	120.00	86.00	28.00	1.500	9056470015000
0.0625	1/16	1.588	4.00	125.00	91.00	28.00	1.590	9056470015900
0.0781	5/64	1.984	4.00	145.00	114.00	28.00	1.980	9056470019800
0.0787		2.000	4.00	145.00	115.00	28.00	2.000	9056470020000
0.0937	3/32	2.381	4.00	160.00	130.00	28.00	2.380	9056470023800
0.0984		2.500	4.00	185.00	155.00	28.00	2.500	9056470025000
0.1094	7/64	2.778	4.00	185.00	155.00	28.00	2.780	9056470027800
0.1181		3.000	6.00	230.00	190.00	36.00	3.000	9056470030000
0.1250	1/8	3.175	6.00	230.00	190.00	36.00	3.170	9056470031700
0.1378		3.500	6.00	230.00	190.00	36.00	3.500	9056470035000
0.1406	9/64	3.572	6.00	260.00	220.00	36.00	3.570	9056470035700
0.1563	5/32	3.969	6.00	260.00	220.00	36.00	3.970	9056470039700
0.1575		4.000	6.00	260.00	220.00	36.00	4.000	9056470040000
0.1719	11/64	4.366	6.00	290.00	245.00	36.00	4.370	9056470043700
0.1875	3/16	4.763	6.00	310.00	268.00	36.00	4.760	9056470047600
0.1969		5.000	6.00	370.00	330.00	36.00	5.000	9056470050000
0.2031	13/64	5.159	6.00	370.00	330.00	36.00	5.160	9056470051600
0.2187	7/32	5.556	6.00	370.00	330.00	36.00	5.560	9056470055600
0.2344	15/64	5.953	6.00	370.00	330.00	36.00	5.950	9056470059500
0.2362		6.000	6.00	370.00	330.00	36.00	6.000	9056470060000
0.2500	1/4	6.350	8.00	430.00	385.00	36.00	6.350	9056470063500
0.2559		6.500	8.00	430.00	385.00	36.00	6.500	9056470065000
0.2656	17/64	6.747	8.00	430.00	385.00	36.00	6.750	9056470067500
0.2756		7.000	8.00	430.00	385.00	36.00	7.000	9056470070000
0.2813	9/32	7.144	8.00	485.00	440.00	36.00	7.140	9056470071400
0.2969	19/64	7.541	8.00	485.00	440.00	36.00	7.540	9056470075400
0.3125	5/16	7.938	8.00	485.00	440.00	36.00	7.940	9056470079400
0.3150		8.000	8.00	485.00	440.00	36.00	8.000	9056470080000
0.3543		9.000	10.00	555.00	506.00	40.00	9.000	9056470090000
0.3937		10.000	10.00	615.00	562.00	40.00	10.000	9056470100000

EB 100 M solid carbide gun drills - 75xD

Series no. **5648**

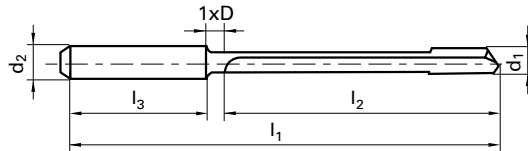


Tool material **Solid Carbide**

Surface **a**

- | | | | |
|----------|-----------------|---|---|
| P | Steel | ● | head form G • solid carbide shank with tapered MQL shank end from d1 = 3 mm / d2 = 6 mm |
| M | Stainless steel | ● | |
| K | Cast iron | ○ | |
| N | Aluminum | ○ | |
| S | Titanium alloys | ○ | |
| H | Hardened steel | ○ | |
- =Optimal
○=Secondary

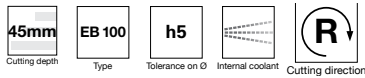
See page 23 for technical operation info
Speeds and feeds information on pg. 26



Diameter (d1)		mm	d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #
inch	wire/tr							
0.0394		1.000	3.00	115.00	80.50	28.00	1.000	9056480010000
0.0469	3/64	1.191	3.00	130.00	96.21	28.00	1.190	9056480011900
0.0591		1.500	4.00	155.00	121.75	28.00	1.500	9056480015000
0.0625	1/16	1.588	4.00	165.00	128.62	28.00	1.590	9056480015900
0.0781	5/64	1.984	4.00	195.00	160.02	28.00	1.980	9056480019800
0.0787		2.000	4.00	195.00	162.00	28.00	2.000	9056480020000
0.0937	3/32	2.381	4.00	220.00	186.43	28.00	2.380	9056480023800
0.0984		2.500	4.00	255.00	216.25	28.00	2.500	9056480025000
0.1094	7/64	2.778	4.00	255.00	215.83	28.00	2.780	9056480027800
0.1181		3.000	6.00	290.00	269.50	36.00	3.000	9056480030000
0.1250	1/8	3.175	6.00	320.00	275.24	36.00	3.170	9056480031700
0.1378		3.500	6.00	320.00	274.75	36.00	3.500	9056480035000
0.1406	9/64	3.572	6.00	360.00	314.64	36.00	3.570	9056480035700
0.1563	5/32	3.969	6.00	360.00	314.05	36.00	3.970	9056480039700
0.1575		4.000	6.00	360.00	314.00	36.00	4.000	9056480040000
0.1719	11/64	4.366	6.00	395.00	348.45	36.00	4.370	9056480043700
0.1875	3/16	4.763	6.00	430.00	379.86	36.00	4.760	9056480047600
0.1969		5.000	6.00	450.00	398.50	36.00	5.000	9056480050000
0.2031	13/64	5.159	6.00	465.00	411.26	36.00	5.160	9056480051600
0.2187	7/32	5.556	6.00	525.00	476.67	36.00	5.560	9056480055600
0.2344	15/64	5.953	6.00	525.00	476.07	36.00	5.950	9056480059500
0.2362		6.000	6.00	525.00	476.00	36.00	6.000	9056480060000
0.2500	1/4	6.350	8.00	560.00	506.48	36.00	6.350	9056480063500
0.2559		6.500	8.00	575.00	518.25	36.00	6.500	9056480065000
0.2656	17/64	6.747	8.00	595.00	537.88	36.00	6.750	9056480067500
0.2756		7.000	8.00	615.00	557.50	36.00	7.000	9056480070000
0.2813	9/32	7.144	8.00	625.00	569.28	36.00	7.140	9056480071400

EB 100 carbide gun drill w/steel shanks - 45mm flute length

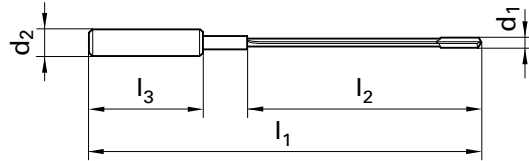
Series no. **5024**



Tool material **Solid Carbide**

Surface

- P** Steel flute lengths of 45, 80, 120 & 160 mm • head form G
 - M** Stainless steel
 - K** Cast iron
 - N** Aluminum
 - S** Titanium alloys
 - H** Hardened steel
- =Optimal
○=Secondary

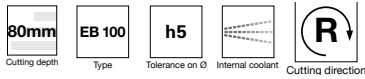


See page 23 for technical operation info
Speeds and feeds information on pg. 26

Diameter (d1)		mm	d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #
inch	wire/ltr							
0.0354		0.900	4.00	90.00	43.65	28.00	0.900	9050240009000
0.0394		1.000	4.00	90.00	43.50	28.00	1.000	9050240010000
0.0433		1.100	4.00	90.00	43.35	28.00	1.100	9050240011000
0.0469	3/64	1.191	4.00	90.00	43.21	28.00	1.190	9050240011900
0.0472		1.200	4.00	90.00	43.20	28.00	1.200	9050240012000
0.0512		1.300	4.00	90.00	43.05	28.00	1.300	9050240013000
0.0551		1.400	4.00	90.00	42.90	28.00	1.400	9050240014000
0.0591		1.500	4.00	90.00	42.75	28.00	1.500	9050240015000
0.0625	1/16	1.588	4.00	90.00	42.62	28.00	1.590	9050240015900
0.0630		1.600	4.00	90.00	42.60	28.00	1.600	9050240016000
0.0748		1.900	4.00	90.00	42.15	28.00	1.900	9050240019000
0.0781	5/64	1.984	4.00	90.00	42.02	28.00	1.980	9050240019800
0.0787		2.000	4.00	90.00	42.00	28.00	2.000	9050240020000
0.0984		2.500	10.00	100.00	41.25	40.00	2.500	9050240025000
0.1063		2.700	10.00	100.00	40.95	40.00	2.700	9050240027000
0.1181		3.000	10.00	100.00	40.50	40.00	3.000	9050240030000
0.1260		3.200	10.00	100.00	40.20	40.00	3.200	9050240032000

EB 100 carbide gun drill w/steel shanks - 80mm flute length

Series no. **5020**

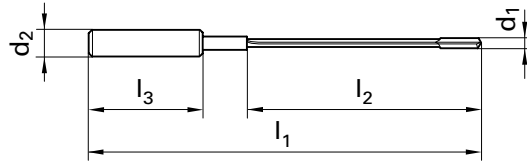


Tool material **Solid Carbide**

Surface

- P** Steel flute lengths of 45, 80, 120 & 160 mm • head form G
- M** Stainless steel
- K** Cast iron
- N** Aluminum
- S** Titanium alloys
- H** Hardened steel

●=Optimal
○=Secondary

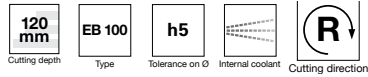


See page 23 for technical operation info
Speeds and feeds information on pg. 26

Diameter (d1)			d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #
inch	wire/ltr	mm						
0.0394		1.000	4.00	125.00	80.00	28.00	1.000	9050200010000
0.0433		1.100	4.00	125.00	80.00	28.00	1.100	9050200011000
0.0469	3/64	1.191	4.00	125.00	80.00	28.00	1.190	9050200011900
0.0472		1.200	4.00	125.00	80.00	28.00	1.200	9050200012000
0.0512		1.300	4.00	125.00	80.00	28.00	1.300	9050200013000
0.0551		1.400	4.00	125.00	80.00	28.00	1.400	9050200014000
0.0591		1.500	4.00	125.00	80.00	28.00	1.500	9050200015000
0.0625	1/16	1.588	4.00	125.00	80.00	28.00	1.590	9050200015900
0.0630		1.600	4.00	125.00	80.00	28.00	1.600	9050200016000
0.0748		1.900	4.00	125.00	80.00	28.00	1.900	9050200019000
0.0781	5/64	1.984	4.00	125.00	80.00	28.00	1.980	9050200019800
0.0787		2.000	4.00	125.00	80.00	28.00	2.000	9050200020000
0.0984		2.500	10.00	135.00	80.00	40.00	2.500	9050200025000
0.1063		2.700	10.00	135.00	80.00	40.00	2.700	9050200027000
0.1181		3.000	10.00	135.00	80.00	40.00	3.000	9050200030000
0.1260		3.200	10.00	135.00	80.00	40.00	3.200	9050200032000
0.1378		3.500	10.00	135.00	80.00	40.00	3.500	9050200035000
0.1575		4.000	10.00	135.00	80.00	40.00	4.000	9050200040000
0.1654		4.200	10.00	135.00	80.00	40.00	4.200	9050200042000
0.1772		4.500	10.00	135.00	80.00	40.00	4.500	9050200045000
0.1969		5.000	10.00	135.00	80.00	40.00	5.000	9050200050000

EB 100 carbide gun drill w/steel shanks - 120mm flute length

Series no. **5026**

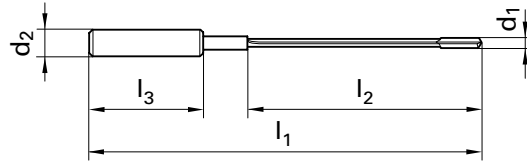


Tool material **Solid Carbide**

Surface

- P** Steel flute lengths of 45, 80, 120 & 160 mm • head form G
- M** Stainless steel
- K** Cast iron
- N** Aluminum
- S** Titanium alloys
- H** Hardened steel

●=Optimal
○=Secondary

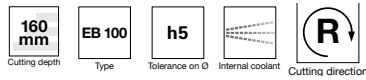


See page 23 for technical operation info
Speeds and feeds information on pg. 26

Diameter (d1)		mm	d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #
inch	wire/ltr							
0.0591		1.500	4.00	165.00	120.00	28.00	1.500	9050260015000
0.0625	1/16	1.588	4.00	165.00	120.00	28.00	1.590	9050260015900
0.0630		1.600	4.00	165.00	120.00	28.00	1.600	9050260016000
0.0781	5/64	1.984	4.00	165.00	120.00	28.00	1.980	9050260019800
0.0787		2.000	4.00	165.00	120.00	28.00	2.000	9050260020000
0.0984		2.500	10.00	175.00	120.00	40.00	2.500	9050260025000
0.1063		2.700	10.00	175.00	120.00	40.00	2.700	9050260027000
0.1181		3.000	10.00	175.00	120.00	40.00	3.000	9050260030000
0.1260		3.200	10.00	175.00	120.00	40.00	3.200	9050260032000
0.1378		3.500	10.00	175.00	120.00	40.00	3.500	9050260035000
0.1575		4.000	10.00	175.00	120.00	40.00	4.000	9050260040000
0.1654		4.200	10.00	175.00	120.00	40.00	4.200	9050260042000
0.1772		4.500	10.00	175.00	120.00	40.00	4.500	9050260045000
0.1969		5.000	10.00	175.00	120.00	40.00	5.000	9050260050000

EB 100 carbide gun drill w/steel shanks - 160mm flute length

Series no. **5021**

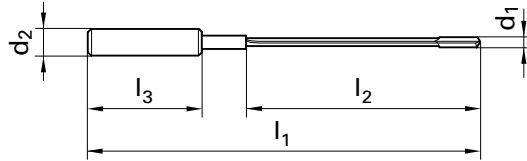


Tool material **Solid Carbide**

Surface



- P** Steel ○ flute lengths of 45, 80, 120 & 160 mm • head form G
 - M** Stainless steel ○
 - K** Cast iron ○
 - N** Aluminum ●
 - S** Titanium alloys ●
 - H** Hardened steel ○
- =Optimal
○=Secondary



See page 23 for technical operation info
Speeds and feeds information on pg. 26

Diameter (d1)		d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #	
inch	wire/ltr							
0.0591		1.500	4.00	205.00	160.00	28.00	1.500	9050210015000
0.0625	1/16	1.588	4.00	205.00	160.00	28.00	1.590	9050210015900
0.0630		1.600	4.00	205.00	160.00	28.00	1.600	9050210016000
0.0781	5/64	1.984	4.00	205.00	160.00	28.00	1.980	9050210019800
0.0787		2.000	4.00	205.00	160.00	28.00	2.000	9050210020000
0.0984		2.500	10.00	215.00	160.00	40.00	2.500	9050210025000
0.1063		2.700	10.00	215.00	160.00	40.00	2.700	9050210027000
0.1181		3.000	10.00	215.00	160.00	40.00	3.000	9050210030000
0.1260		3.200	10.00	215.00	160.00	40.00	3.200	9050210032000
0.1378		3.500	10.00	215.00	160.00	40.00	3.500	9050210035000
0.1575		4.000	10.00	215.00	160.00	40.00	4.000	9050210040000
0.1654		4.200	10.00	215.00	160.00	40.00	4.200	9050210042000
0.1772		4.500	10.00	215.00	160.00	40.00	4.500	9050210045000
0.1969		5.000	10.00	215.00	160.00	40.00	5.000	9050210050000
0.2362		6.000	16.00	225.00	160.00	40.00	6.000	9050210060000
0.3150		8.000	16.00	225.00	160.00	48.00	8.000	9050210080000

EB 80 single-fluted gun drills - 40xD

Series no. **5641**



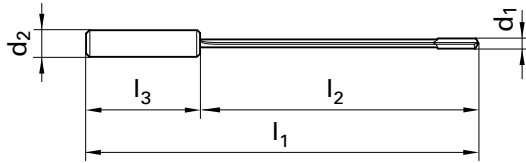
Tool material **Solid Carbide**

Surface **C**

P	Steel	○
M	Stainless steel	●
K	Cast iron	○
N	Aluminum	○
S	Titanium alloys	●
H	Hardened steel	○

●=Optimal
○=Secondary

head form G



See page 23 for technical operation info
Speeds and feeds information on pg. 27

Diameter (d1)		mm	d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #
inch	wire/ltr							
0.1563	5/32	3.969	10.00	230.00	185.00	40.00	3.970	9056410039700
0.1575		4.000	12.00	230.00	185.00	45.00	4.000	9056410040000
0.1654		4.200	12.00	240.00	195.00	45.00	4.200	9056410042000
0.1772		4.500	12.00	250.00	205.00	45.00	4.500	9056410045000
0.1969		5.000	16.00	280.00	232.00	48.00	5.000	9056410050000
0.2031	13/64	5.159	16.00	280.00	232.00	48.00	5.156	9056410051560
0.2165		5.500	16.00	300.00	252.00	48.00	5.500	9056410055000
0.2362		6.000	16.00	320.00	272.00	48.00	6.000	9056410060000
0.2500	1/4	E	6.350	340.00	292.00	48.00	6.350	9056410063500
0.2559		6.500	16.00	340.00	292.00	48.00	6.500	9056410065000
0.2756		7.000	16.00	370.00	322.00	48.00	7.000	9056410070000
0.3125	5/16	7.938	16.00	420.00	372.00	48.00	7.938	9056410079380
0.3150		8.000	16.00	420.00	372.00	48.00	8.000	9056410080000
0.3543		9.000	16.00	450.00	402.00	48.00	9.000	9056410090000
0.3750	3/8	9.525	16.00	480.00	432.00	48.00	9.525	9056410095250
0.3937		10.000	20.00	510.00	460.00	50.00	10.000	9056410100000
0.4331		11.000	20.00	550.00	500.00	50.00	11.000	9056410110000
0.4375	7/16	11.113	20.00	550.00	500.00	50.00	11.113	9056410111130
0.4724		12.000	20.00	600.00	550.00	50.00	12.000	9056410120000
0.5000	1/2	12.700	20.00	635.00	585.00	50.00	12.700	9056410127000

EB 80 single-fluted gun drills - 80xD

Series no. **5642**



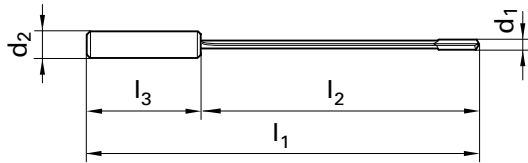
Tool material **Solid Carbide**

Surface **C**

P	Steel	○
M	Stainless steel	●
K	Cast iron	○
N	Aluminum	○
S	Titanium alloys	●
H	Hardened steel	○

●=Optimal
○=Secondary

head form G



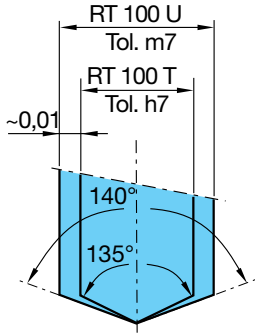
See page 23 for technical operation info
Speeds and feeds information on pg. 27

Diameter (d1)		mm	d2 mm	l1 mm	l2 mm	l3 mm	Code no.	EDP #
inch	wire/tr							
0.1949		4.950	16.00	480.00	432.00	48.00	4.950	9056420049500
0.2010		5.106	16.00	480.00	432.00	48.00	5.106	9056420051060
0.2146		5.450	16.00	520.00	470.00	48.00	5.450	9056420054500
0.2344		5.953	16.00	560.00	512.00	48.00	5.950	9056420059500
0.2480		6.300	16.00	590.00	542.00	48.00	6.300	9056420063000
0.2539		6.450	16.00	605.00	556.00	48.00	6.450	9056420064500
0.2736		6.950	16.00	650.00	602.00	48.00	6.950	9056420069500
0.3106		7.888	16.00	740.00	692.00	48.00	7.888	9056420078880
0.3130		7.950	16.00	740.00	692.00	48.00	7.950	9056420079500
0.3524		8.950	16.00	820.00	772.00	48.00	8.950	9056420089500
0.3730		9.475	16.00	870.00	822.00	48.00	9.475	9056420094750
0.3917		9.950	20.00	910.00	860.00	50.00	9.950	9056420099500
0.4311		10.950	20.00	995.00	945.00	50.00	10.950	9056420109500
0.4356		11.063	20.00	995.00	945.00	50.00	11.063	9056420110630
0.4705		11.950	20.00	1080.00	1030.00	50.00	11.950	9056420119500
0.4980		12.650	20.00	1140.00	1090.00	50.00	12.650	9056420126500

Technical Information - Deep Hole Drilling



RT100T deep hole drills must utilize a pilot hole to guide the drill. Deep hole drills must never operate at full speed without support in the pilot hole.

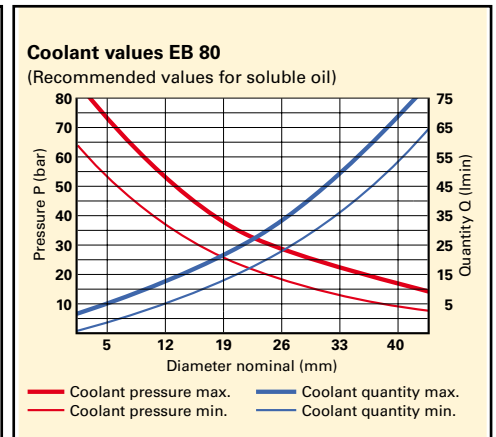
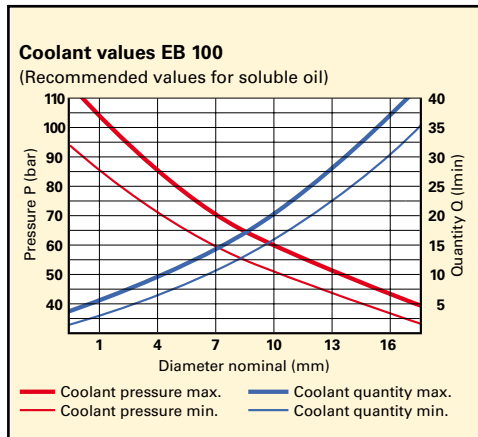
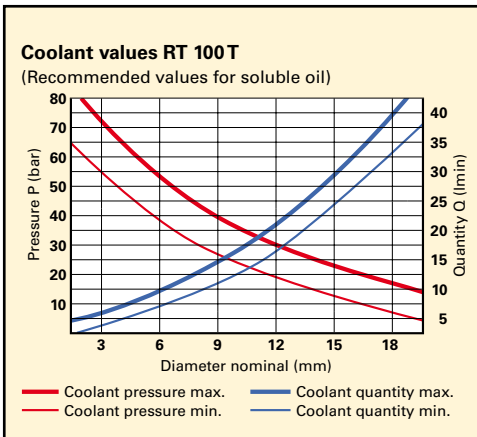


Pilot Hole

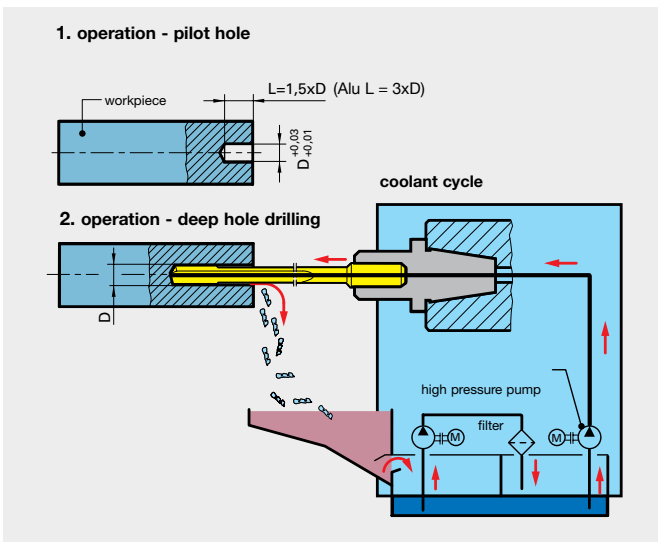
Recommended drilling procedure for RT 100 T drills:

- Machine a pilot hole with an m7 toleranced Guhring type RT 100 drill (i.e., series 5510) to a minimum pilot depth of 1.5xD to 3xD.
- Enter the pilot hole at a speed of approx. 300 RPM, and with a feed rate of approx. 20 IPM stopping just shy of the bottom of the hole.
- Start high coolant pressure and increase RPM to recommended value.
- Feed drill at recommended feed rate to final hole depth. No peck cycle required.
- For through holes with oblique exit, reduce the feed rate to 40% approx. 1 mm prior to break-through.
- After reaching hole depth, turn off coolant, reduce machine spindle speed to 300RPM and withdraw the drill at a maximum feed rate of 200IPM.

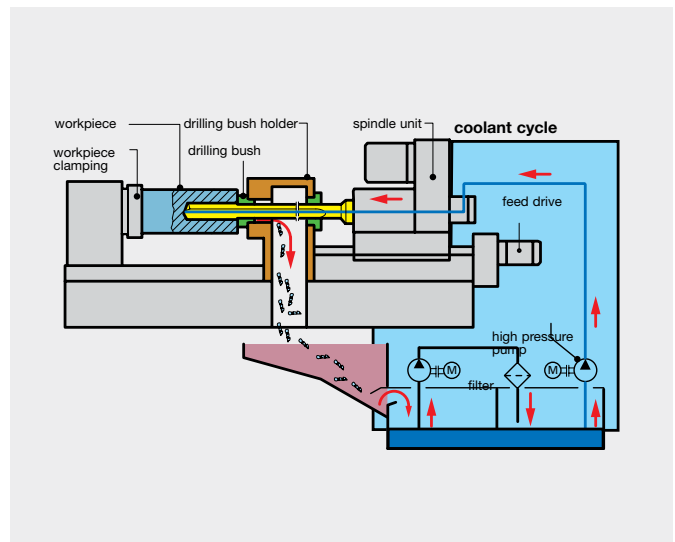
Recommended Coolant Pressure



CNC machine tools



Gun drilling machines

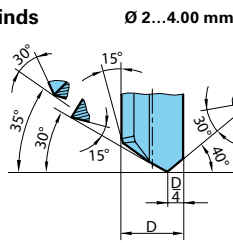


Technical Information - Gun Drills

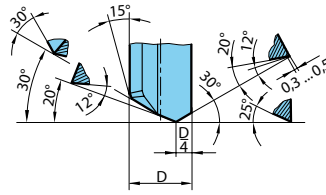
EB 100

Standard point grinds

(special point grinds on request)



Ø > 4.01...20 mm

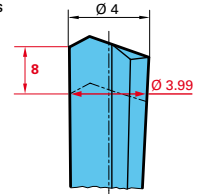


EB 100

1:800 (standard)

Back taper ratio

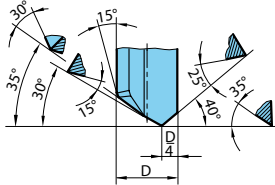
(dimensions in mm)



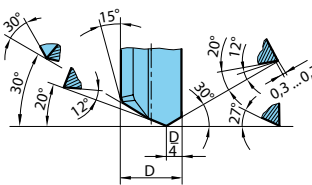
EB 80 standard point grinds

(special point grinds available)

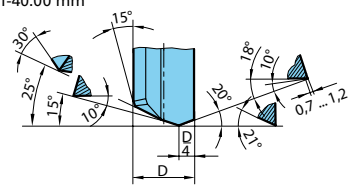
Ø 2.00-4.00 mm



Ø 4.01-20.00 mm



Ø 20.01-40.00 mm



All gun drills must utilize a pilot hole (CNC machine) or drill bushing (gun drilling machine) to guide the drill. Gun drills must never operate at full speed without support in the pilot hole or drill bushing.

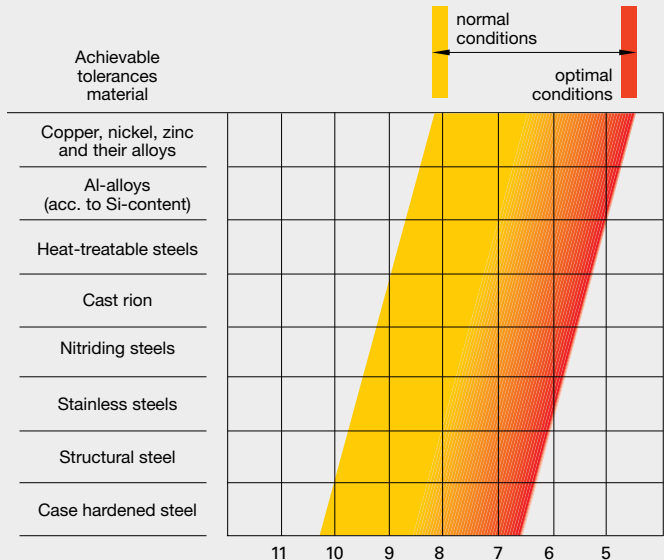
Recommended drilling procedure using gun drills on CNC machine tools:

- Machine a pilot hole using a Guhring carbide drill with an m7 tolerance (i.e., series 6400, series 5510, etc.) to a minimum pilot depth of 1.5xD to 3xD.
- Enter pilot hole at low speed, approx. 200 RPM, feed rate approx. 20 IPM, stopping just shy of the bottom of the hole. With tools for drilling depths in excess than 40xD enter the pilot hole with the spindle rotating in the counter-clockwise direction.
- Start high coolant pressure and increase RPM to the recommended value.
- Feed drill at recommended feed rate to final hole depth. No peck cycle required.
- For through holes with oblique exit, reduce the feed rate to 40% approx. 1 mm prior to break-through.
- After reaching hole depth, turn off coolant, reduce machine spindle speed to 200RPM and withdraw the drill at a maximum feed rate of 200IPM.

Single fluted gun drill accuracy

Basic tolerances*

The application of single-fluted gun drills can achieve a lower basic tolerance, as the cutting forces at the cutting edge are absorbed by the guide pads, unlike twist drills where the slightest deviation of the two cutting edges causes a larger hole.



Material group	Hardness		SFM	Feed Rate - IPR									
	HRC	Bhn		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	360	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 32	≤ 301	360	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Free-cutting steels	≤ 25	≤ 255	395	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 32	≤ 301	395	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Unalloyed heat-treatable steels	≤ 20	≤ 220	360	0.0030	0.0040	0.0060	0.0090	0.0100	0.0120				
	≤ 25	≤ 255	360	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 32	≤ 301	330	0.0030	0.0050	0.0080	0.0110	0.0120	0.0160				
Alloyed heat-treatable steels	≤ 32	≤ 301	360	0.0030	0.0050	0.0080	0.0110	0.0120	0.0160				
	≤ 43	≤ 402	360	0.0030	0.0040	0.0060	0.0090	0.0100	0.0120				
Unalloyed case hardened steels	≤ 25	≤ 255	360	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Alloyed case hardened steels	≤ 32	≤ 301	360	0.0030	0.0050	0.0080	0.0110	0.0120	0.0160				
	≤ 43	≤ 402	360	0.0030	0.0040	0.0060	0.0090	0.0100	0.0120				
Nitriding steels	≤ 32	≤ 301	330	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
	≤ 43	≤ 402	260	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
Tool steels	≤ 25	≤ 255	330	0.0030	0.0040	0.0060	0.0090	0.0100	0.0120				
	≤ 43	≤ 402	260	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
High speed steels	≤ 43	≤ 402	165	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
Spring steels	≤ 38	≤ 354	165	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
Hardened steels	≤ 48	≤ 460	165	0.0020	0.0020	0.0040	0.0060	0.0060	0.0080				
	≤ 66	-	165	0.0010	0.0020	0.0040	0.0060	0.0060	0.0080				
Stainless steels, sulphured austenitic	≤ 28	≤ 273	330	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
	≤ 36	≤ 337	230	0.0010	0.0020	0.0020	0.0040	0.0040	0.0050				
	≤ 46	≤ 435	330	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
Cast iron	≤ 23	≤ 242	460	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 38	≤ 354	330	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242	460	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 38	≤ 354	330	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Chilled cast iron	≤ 38	≤ 354											
New cast materials GGV	≤ 20	≤ 220	330	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125				
	≤ 32	≤ 301	330	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125				
New cast materials ADI	≤ 32	≤ 301	295	0.0010	0.0065	0.0100	0.0155	0.0155	0.0195				
	≤ 43	≤ 402											
Special alloys	≤ 54	≤ 549	100	0.0040	0.0020	0.0020	0.0040	0.0040	0.0050				
Ti and Ti-alloys	≤ 25	≤ 255											
	≤ 43	≤ 402											
Aluminium and Al-alloys	-	≤ 120											
Al wrought alloys	-	≤ 200											
Al cast alloys ≤ 10 % Si	-	≤ 180											
≤ 24 % Si	-	≤ 180											
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150	395		0.0010	0.0020	0.0030	0.0030	0.0040				
Brass, short-chipping	-	≤ 180	395	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
long-chipping	-	≤ 180											
Bronze, short-chipping	-	≤ 180											
	≤ 25	≤ 255											
Bronze, long-chipping	≤ 25	≤ 255											
	≤ 32	≤ 301											

Material group	Hardness		SFM	Feed Rate - IPR									
	HRC	Bhn		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	360	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 32	≤ 301	360	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Free-cutting steels	≤ 25	≤ 255	395	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 32	≤ 301	395	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Unalloyed heat-treatable steels	≤ 20	≤ 220	360	0.0030	0.0040	0.0060	0.0090	0.0100	0.0120				
	≤ 25	≤ 255	360	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 32	≤ 301	330	0.0030	0.0050	0.0080	0.0110	0.0120	0.0160				
Alloyed heat-treatable steels	≤ 32	≤ 301	360	0.0030	0.0050	0.0080	0.0110	0.0120	0.0160				
	≤ 43	≤ 402	360	0.0030	0.0040	0.0060	0.0090	0.0100	0.0120				
Unalloyed case hardened steels	≤ 25	≤ 255	360	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Alloyed case hardened steels	≤ 32	≤ 301	360	0.0030	0.0050	0.0080	0.0110	0.0120	0.0160				
	≤ 43	≤ 402	360	0.0030	0.0040	0.0060	0.0090	0.0100	0.0120				
Nitriding steels	≤ 32	≤ 301	330	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
	≤ 43	≤ 402	260	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
Tool steels	≤ 25	≤ 255	330	0.0030	0.0040	0.0060	0.0090	0.0100	0.0120				
	≤ 43	≤ 402	260	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
High speed steels	≤ 43	≤ 402	165	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
Spring steels	≤ 38	≤ 354	165	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
Hardened steels	≤ 48	≤ 460	165	0.0020	0.0020	0.0040	0.0060	0.0060	0.0080				
	≤ 66	-	165	0.0010	0.0020	0.0040	0.0060	0.0060	0.0080				
Stainless steels, sulphured austenitic	≤ 28	≤ 273	330	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
	≤ 36	≤ 337	230	0.0010	0.0020	0.0020	0.0040	0.0040	0.0050				
	≤ 46	≤ 435	330	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100				
Cast iron	≤ 23	≤ 242	460	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 38	≤ 354	330	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242	460	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
	≤ 38	≤ 354	330	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
Chilled cast iron	≤ 38	≤ 354											
New cast materials GGV	≤ 20	≤ 220	330	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125				
	≤ 32	≤ 301	330	0.0005	0.0040	0.0065	0.0100	0.0100	0.0125				
New cast materials ADI	≤ 32	≤ 301	295	0.0010	0.0065	0.0100	0.0155	0.0155	0.0195				
	≤ 43	≤ 402											
Special alloys	≤ 54	≤ 549	100	0.0040	0.0020	0.0020	0.0040	0.0040	0.0050				
Ti and Ti-alloys	≤ 25	≤ 255											
	≤ 43	≤ 402											
Aluminium and Al-alloys	-	≤ 120											
Al wrought alloys	-	≤ 200											
Al cast alloys ≤ 10 % Si	-	≤ 180											
≤ 24 % Si	-	≤ 180											
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150	395		0.0010	0.0020	0.0030	0.0030	0.0040				
Brass, short-chipping	-	≤ 180	395	0.0040	0.0060	0.0100	0.0140	0.0160	0.0200				
long-chipping	-	≤ 180											
Bronze, short-chipping	-	≤ 180											
	≤ 25	≤ 255											
Bronze, long-chipping	≤ 25	≤ 255											
	≤ 32	≤ 301											

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