



RT 100 R

**Specialist for the machining
of cast materials with patented
radius point geometry**

EXCLUSIVELINE®

Made by Guhring

Ratio drill type RT 100 R

New materials require new tooling solutions. As an innovative tool manufacturer, Guhring has always followed this concept and is reacting to the increasing application of CGI (cast iron with compacted graphite iron) and ADI (austempered ductile iron) in the automotive industry with the new Ratio drill type RT 100 R.

High tensile strength is exceptionally demanding

CGI and ADI offer high tensile strengths, i.e. making it possible to increase the output of an engine whilst keeping the wall thickness of the engine block the same or to reduce the weight through thinner

wall thicknesses whilst keeping the output of the engine the same. Subsequently, the automotive industry is demanding tools from tool manufacturers that can economically machine these new materials. Conventional drills have so far not achieved satisfactory results.

Guhring has therefore developed the new Ratio drill type RT 100 R. Thanks to its patented radius point geometry it offers highest performance and economic efficiency for the machining of the new materials. With its unique balance of face contour and flute profile it provides rigidity, dimensional accuracy and process reliability.

Powerful in common cast materials

The new radius point geometry offers more than machining of CGI and ADI. It is also recommended for the machining of common cast materials such as grey cast iron, spheroidal graphite and malleable cast iron.

New:

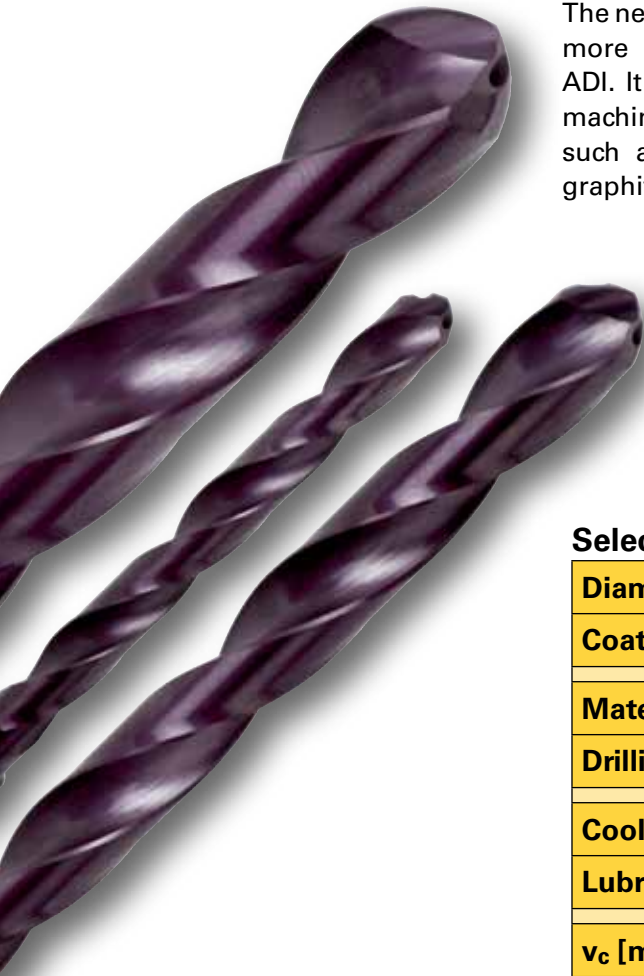
Standard range 5 x D and 7 x D

Now the wear resistant solid carbide drill is available as a standard item in the ExclusiveLine range. The two standard drills are 5 x D and 7 x D with internal cooling and are suitable for a wide range of applications. However, they offer ex-stock availability and reasonable prices.

Furthermore the RT 100 R is available as a special tool with or without internal cooling to fit your specific application. Guhring can, for example, provide application orientated coatings or even modify the design of a step drill. For the special tool request form please see page 7.

Our recommendation:

The RT 100 R drills are especially suited for machining under minimal quantity lubrication conditions. With MQL we recommend a tool design with conical shank end and the application of Guhring's MQL screw and components. Please contact our technical service department for more information.



Selected machining results with RT 100 R drills

Diameter	16	17
Coating	FIRE	Super A
Material	GGG50	GGG40
Drilling depth (mm)	20	50
Cooling	IK	IK
Lubricant	neat oil	soluble oil
v_c [m/min]	120	160
f [mm/rev.]	0,5	0,6
Tool life [m]	615	305

Ratio drill type RT 100 R

Convincing:

Minimal wear in benchmark test

The performance capacity of the new RT 100 R was very impressively proven in two benchmark tests carried out for the automotive industry. The drill was convincing thanks to having the lowest wear and the highest process reliability in comparison to the other tools tested.

In the first test, PTW Darmstadt determined the wear of the tool by measuring the width of wear at the cutting edge following 100 m tool life travel. With a width of wear of only 0.196 mm, RT 100 R showed the least sign of wear (diagram 2).

PTW compared drills of 5.0 mm diameter with a drilling depth of 20 mm in GGV450 as well as high pressure internal cooling of 65 bar in the test. The cutting rates were $v_c = 80$ m/min. and $f = 0.2$ mm/rev.

In addition, PTW also determined the development of the outer corner wear in order to receive a prediction regarding the expected final tool life figure. Even after 5000 holes the outer corner wear showed a consistent low wear of the tool, reason to believe that the end of tool life had

not been reached by far – a clear indication of the high economic efficiency and process reliability of RT 100 R (diagram 1).

Tool life testing:

In the second test, a step drill type RT 100 R, FIRE-coated in the diameters 14.5 or 20.0 mm respectively with 45° chamfer was examined in GGV40. The drilling depth was 70 mm, the cutting rates were $v_c = 70$ m/min and $f = 0.3$ mm/rev.. The tool had internal cooling with 50 bar.

A minimum tool life of at least 120 m was expected to be achieved in the test. The step drill type RT 100 R had definitely not reached the end of its tool life after 214 m and showed an even wear pattern (diagram 3). Furthermore, it was the only drill in the test that kept the coating at the leading land intact for its entire tool life. In a second test the RT 100 R fared even better!

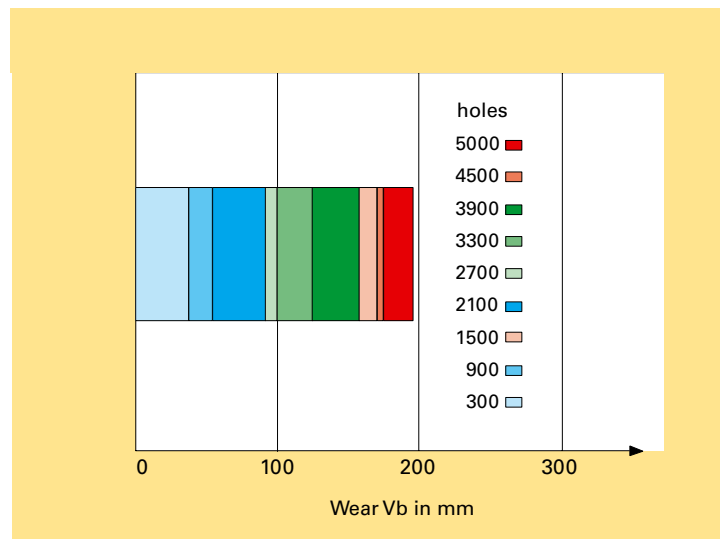


Diagram 1: Development of the outer corner wear regarding to tool life

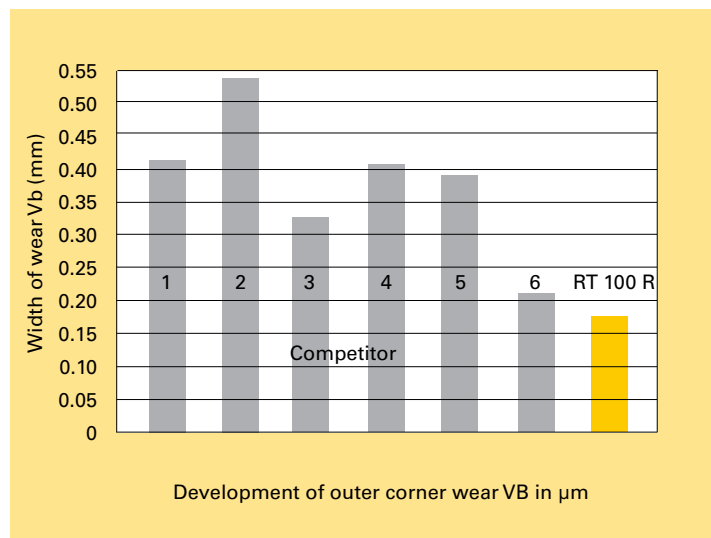


Diagram 2: Width of wear after 100 m tool life: IXION BAZ 325
High pressure int. cooling 65 bar $v_c = 80$ m/min; $f = 0.2$ mm/rev.
 $d = 5.0$ mm; $t = 20$ mm Test at PTW

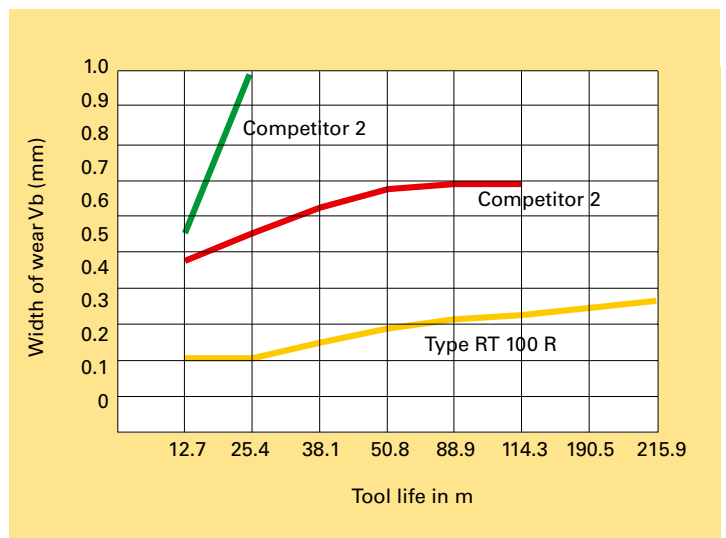


Diagram 3: Wear of face at a FIRE coated drill type RT 100 R

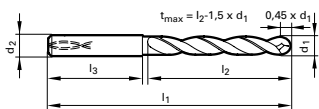
RT 100 R 5 x D – Technical data and dimensions

Tool material	Sol. carb.
Surface finish	F
Cooling	■
Discount group	65
Guhring no.	6501

DIN **6537**
 Shank design **DIN 6535 HA**
 Type **Ratio R**

Product information

- drilling depth ~ 5 x D
- right-hand cutting
- patent pending
- flute design normal
- Ø tolerance m7
- coolant supply through the body



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Availability
3.00	6	66	28	36	●
3.10	6	66	28	36	●
3.17	6	66	28	36	●
3.20	6	66	28	36	●
3.25	6	66	28	36	●
3.30	6	66	28	36	●
3.40	6	66	28	36	●
3.50	6	66	28	36	●
3.57	6	66	28	36	●
3.60	6	66	28	36	●
3.70	6	66	28	36	●
3.80	6	74	36	36	●
3.90	6	74	36	36	●
3.97	6	74	36	36	●
4.00	6	74	36	36	●
4.10	6	74	36	36	●
4.20	6	74	36	36	●
4.30	6	74	36	36	●
4.37	6	74	36	36	●
4.40	6	74	36	36	●
4.50	6	74	36	36	●
4.60	6	74	36	36	●
4.65	6	74	36	36	●
4.70	6	74	36	36	●
4.76	6	82	44	36	●
4.80	6	82	44	36	●
4.90	6	82	44	36	●
5.00	6	82	44	36	●
5.10	6	82	44	36	●
5.16	6	82	44	36	●
5.20	6	82	44	36	●
5.30	6	82	44	36	●
5.40	6	82	44	36	●
5.50	6	82	44	36	●
5.55	6	82	44	36	●
5.56	6	82	44	36	●
5.60	6	82	44	36	●
5.70	6	82	44	36	●
5.80	6	82	44	36	●

Tool material	Sol. carb.
Surface finish	F
Cooling	■
Discount group	65
Guhring no.	6501

d1	d2	l1	l2	l3	Availability
5.90	6	82	44	36	●
5.95	6	82	44	36	●
6.00	6	82	44	36	●
6.10	8	91	53	36	●
6.20	8	91	53	36	●
6.30	8	91	53	36	●
6.35	8	91	53	36	●
6.40	8	91	53	36	●
6.50	8	91	53	36	●
6.60	8	91	53	36	●
6.70	8	91	53	36	●
6.75	8	91	53	36	●
6.80	8	91	53	36	●
6.90	8	91	53	36	●
7.00	8	91	53	36	●
7.10	8	91	53	36	●
7.14	8	91	53	36	●
7.20	8	91	53	36	●
7.30	8	91	53	36	●
7.40	8	91	53	36	●
7.50	8	91	53	36	●
7.54	8	91	53	36	●
7.60	8	91	53	36	●
7.70	8	91	53	36	●
7.80	8	91	53	36	●
7.90	8	91	53	36	●
7.94	8	91	53	36	●
8.00	8	91	53	36	●
8.10	10	103	61	40	●
8.20	10	103	61	40	●
8.30	10	103	61	40	●
8.33	10	103	61	40	●
8.40	10	103	61	40	●
8.50	10	103	61	40	●
8.60	10	103	61	40	●
8.70	10	103	61	40	●
8.73	10	103	61	40	●
8.80	10	103	61	40	●
8.90	10	103	61	40	●
9.00	10	103	61	40	●
9.10	10	103	61	40	●
9.13	10	103	61	40	●
9.20	10	103	61	40	●
9.25	10	103	61	40	●
9.30	10	103	61	40	●
9.40	10	103	61	40	●
9.50	10	103	61	40	●
9.52	10	103	61	40	●
9.60	10	103	61	40	●
9.70	10	103	61	40	●
9.80	10	103	61	40	●
9.90	10	103	61	40	●
9.92	10	103	61	40	●
10.00	10	103	61	40	●
10.10	12	118	71	45	●
10.20	12	118	71	45	●
10.30	12	118	71	45	●
10.32	12	118	71	45	●
10.40	12	118	71	45	●
10.50	12	118	71	45	●
10.60	12	118	71	45	●
10.70	12	118	71	45	●
10.72	12	118	71	45	●

Tool material	Sol. carb.
Surface finish	F
Cooling	■
Discount group	65
Guhring no.	6501

d1	d2	l1	l2	l3	Availability
10.80	12	118	71	45	●
10.90	12	118	71	45	●
11.00	12	118	71	45	●
11.10	12	118	71	45	●
11.11	12	118	71	45	●
11.20	12	118	71	45	●
11.30	12	118	71	45	●
11.40	12	118	71	45	●
11.50	12	118	71	45	●
11.60	12	118	71	45	●
11.70	12	118	71	45	●
11.80	12	118	71	45	●
11.90	12	118	71	45	●
11.91	12	118	71	45	●
12.00	12	118	71	45	●
12.10	14	124	77	45	●
12.20	14	124	77	45	●
12.30	14	124	77	45	●
12.40	14	124	77	45	●
12.50	14	124	77	45	●
12.60	14	124	77	45	●
12.70	14	124	77	45	●
12.80	14	124	77	45	●
12.90	14	124	77	45	●
13.00	14	124	77	45	●
13.10	14	124	77	45	●
13.30	14	124	77	45	●
13.40	14	124	77	45	●
13.50	14	124	77	45	●
13.70	14	124	77	45	●
13.80	14	124	77	45	●
13.90	14	124	77	45	●
14.00	14	124	77	45	●
14.10	16	133	83	48	●
14.20	16	133	83	48	●
14.29	16	133	83	48	●
14.30	16	133	83	48	●
14.40	16	133	83	48	●
14.50	16	133	83	48	●
14.60	16	133	83	48	●
14.70	16	133	83	48	●
14.90	16	133	83	48	●
15.00	16	133	83	48	●
15.10	16	133	83	48	●
15.20	16	133	83	48	●
15.30	16	133	83	48	●
15.40	16	133	83	48	●
15.50	16	133	83	48	●
15.60	16	133	83	48	●
15.70	16	133	83	48	●
15.80	16	133	83	48	●
15.87	16	133	83	48	●
15.90	16	133	83	48	●
16.00	16	133	83	48	●
16.50	18	143	93	48	●
16.67	18	143	93	48	●
17.00	18	143	93	48	●
17.50	18	143	93	48	●
18.00	18	143	93	48	●
18.50	20	153	101	50	●
19.00	20	153	101	50	●
19.50	20	153	101	50	●
20.00	20	153	101	50	●

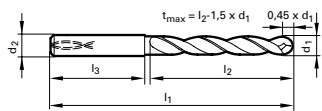
RT 100 R 7 x D – Technical data and dimensions

Tool material	Sol. carb.
Surface finish	F
Cooling	■
Discount group	65
Guhring no.	6502

DIN **Guhring std.**
Shank design **DIN 6535 HA**
Type **Ratio R**

Product information

- drilling depth ~ 7 x D
- right-hand cutting
- patent pending
- flute design normal
- Ø tolerance m7
- coolant supply through the body



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Availability
4.00	6	75	37.5	36	●
4.10	6	75	37.5	36	●
4.20	6	75	37.5	36	●
4.30	6	85	45	36	●
4.37	6	85	45	36	●
4.40	6	85	45	36	●
4.50	6	85	45	36	●
4.60	6	85	45	36	●
4.65	6	85	45	36	●
4.70	6	85	45	36	●
4.76	6	90	50	36	●
4.80	6	90	50	36	●
4.90	6	90	50	36	●
5.00	6	90	50	36	●
5.10	6	90	50	36	●
5.16	6	90	50	36	●
5.20	6	90	50	36	●
5.30	6	90	50	36	●
5.40	6	97	57	36	●
5.50	6	97	57	36	●
5.55	6	97	57	36	●
5.56	6	97	57	36	●
5.60	6	97	57	36	●
5.70	6	97	57	36	●
5.80	6	97	57	36	●
5.90	6	97	57	36	●
5.95	6	97	57	36	●
6.00	6	97	57	36	●
6.10	8	106	66	36	●
6.20	8	106	66	36	●
6.30	8	106	66	36	●
6.35	8	106	66	36	●
6.40	8	106	66	36	●
6.50	8	106	66	36	●
6.60	8	106	66	36	●
6.70	8	106	66	36	●
6.75	8	106	66	36	●
6.80	8	106	66	36	●
6.90	8	116	76	36	●

Tool material	Sol. carb.
Surface finish	F
Cooling	■
Discount group	65
Guhring no.	6502

d1	d2	l1	l2	l3	Availability
7.00	8	116	76	36	●
7.10	8	116	76	36	●
7.14	8	116	76	36	●
7.20	8	116	76	36	●
7.30	8	116	76	36	●
7.40	8	116	76	36	●
7.50	8	116	76	36	●
7.54	8	116	76	36	●
7.60	8	116	76	36	●
7.70	8	116	76	36	●
7.80	8	116	76	36	●
7.90	8	116	76	36	●
7.94	8	116	76	36	●
8.00	8	116	76	36	●
8.10	10	131	87	40	●
8.20	10	131	87	40	●
8.30	10	131	87	40	●
8.33	10	131	87	40	●
8.40	10	131	87	40	●
8.50	10	131	87	40	●
8.60	10	131	87	40	●
8.70	10	131	87	40	●
8.73	10	131	87	40	●
8.80	10	131	87	40	●
8.90	10	131	87	40	●
9.00	10	131	87	40	●
9.10	10	139	95	40	●
9.13	10	139	95	40	●
9.20	10	139	95	40	●
9.25	10	139	95	40	●
9.30	10	139	95	40	●
9.40	10	139	95	40	●
9.50	10	139	95	40	●
9.52	10	139	95	40	●
9.60	10	139	95	40	●
9.70	10	139	95	40	●
9.80	10	139	95	40	●
9.90	10	139	95	40	●
9.92	10	139	95	40	●
10.00	10	139	95	40	●
10.10	12	155	106	45	●
10.20	12	155	106	45	●
10.30	12	155	106	45	●
10.32	12	155	106	45	●
10.40	12	155	106	45	●
10.50	12	155	106	45	●
10.60	12	155	106	45	●
10.70	12	155	106	45	●
10.72	12	155	106	45	●
10.80	12	155	106	45	●
10.90	12	155	106	45	●
11.00	12	155	106	45	●
11.10	12	163	114	45	●
11.11	12	163	114	45	●
11.20	12	163	114	45	●
11.30	12	163	114	45	●
11.40	12	163	114	45	●
11.50	12	163	114	45	●
11.60	12	163	114	45	●
11.70	12	163	114	45	●
11.80	12	163	114	45	●
11.90	12	163	114	45	●
11.91	12	163	114	45	●

Tool material	Sol. carb.
Surface finish	F
Cooling	■
Discount group	65
Guhring no.	6502

d1	d2	l1	l2	l3	Availability
12.00	12	163	114	45	●
12.10	14	182	133	45	●
12.20	14	182	133	45	●
12.30	14	182	133	45	●
12.40	14	182	133	45	●
12.50	14	182	133	45	●
12.60	14	182	133	45	●
12.70	14	182	133	45	●
12.80	14	182	133	45	●
12.90	14	182	133	45	●
13.00	14	182	133	45	●
13.10	14	182	133	45	●
13.30	14	182	133	45	●
13.40	14	182	133	45	●
13.50	14	182	133	45	●
13.70	14	182	133	45	●
13.80	14	182	133	45	●
13.90	14	182	133	45	●
14.00	14	182	133	45	●
14.10	16	204	152	48	●
14.20	16	204	152	48	●
14.29	16	204	152	48	●
14.30	16	204	152	48	●
14.40	16	204	152	48	●
14.50	16	204	152	48	●
14.60	16	204	152	48	●
14.70	16	204	152	48	●
14.90	16	204	152	48	●
15.00	16	204	152	48	●
15.10	16	204	152	48	●
15.20	16	204	152	48	●
15.30	16	204	152	48	●
15.40	16	204	152	48	●
15.50	16	204	152	48	●
15.60	16	204	152	48	●
15.70	16	204	152	48	●
15.80	16	204	152	48	●
15.87	16	204	152	48	●
15.90	16	204	152	48	●
16.00	16	204	152	48	●
16.50	18	223	171	48	●
16.67	18	223	171	48	●
17.00	18	223	171	48	●
17.50	18	223	171	48	●
18.00	18	223	171	48	●
18.50	20	244	190	50	●
19.00	20	244	190	50	●
19.50	20	244	190	50	●
20.00	20	244	190	50	●

FIRE-coated **F** ■ with internal cooling

RT 100 R-Application recommendations

General hints:

Powerful machines, no play in spindle bearings, alignment accurate tool holders. Max. concentricity error of clamped tools 0.02 mm, high coolant pressures. We recommend the application of hydraulic chucks or shrink fit chucks.

Coolant hints:

We recommend lubrication by soluble oil or neat oil. Under special conditions cooling just by air is possible. But instead of air cooling we would always prefer minimal quantity lubrication, that the tools are especially suited for. With MQL we recommend the conical shank end and the Guhring MQL components. Please contact our technical service department for more information.

- FIRE-coated
- with coolant ducts

drill-Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000

Tool material	VHM	
Carbide grade	K20	
Surface finish	●	
Cooling	■	
Drilling depth	~ 5 x D	~ 7 x D
Guh. no.	DIN 6537	6501
	Guhring std.	6502



Material	Material example <i>Figures in bold = material no. to DIN EN 10 027</i>	Tens. strength Hard- MPa (N/mm ²) ness	V _c m/min	Feed column no.	
Common structural steels	1.0035 S185, 1.0486 StE P275N, 1.0345 P235GH, 1.0425 P265GH 1.0050 E295, 1.0070 E360, 1.8937 P500NH	≤ 500 > 500-850			
Free-cutting steels	1.0718 11SMnPb30, 1.0736 115Mn37 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20	≤ 850 850-1000			
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C45E 1.0601 C60, 1.1221 C60E	≤ 700 700-850 850-1000			
Alloyed heat-treatable steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-1000 1000-1200			
Unalloyed case hardened steels	1.0301 C10, 1.1121 C10E	≤ 750			
Alloyed case hardened steels	1.7043 38Cr4 1.5752 14NiCr14, 1.7131 16MnCr5, 1.7264 20CrMo5	850-1000 1000-1200			
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1000 1000-1200			
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤ 850 850-1000			
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 61CrV4	≥ 650-1000			
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	≤ 330 HB			
Stainless steels, sulphured austenitic martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18 9 1.4301 X5CrNi18 10, 1.4541 X6CrNiTi18 10, 1.4571 X6CrNiMoTi 17 12 2 1.4057 X17CrNi16-1, 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18 2	≤ 850 ≤ 850 ≤ 850			
Hardened steels	-	≤ 40-60 HRC			
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤ 1200			
Cast iron	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)	≤ 240 HB < 300 HB	210 160	9 9	8 8
New cast materials GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		130 100	8 8	7 7
New cast materials ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400	80 60	8 8	7 7
Spheroidal graphite and malleable cast iron	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≤ 240 HB < 300 HB	160 130	8 8	8 7
Chilled cast iron	-	≤ 350 HB			
Ti and Ti-alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, -TiAl8Mo1V1	≤ 850 850-1200			
Aluminium and Al-alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤ 400			
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 450			
Al cast iron ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤ 600			
Al cast iron > 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤ 600			
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤ 450			
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤ 400			
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤ 600			
Brass, long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤ 600			
Bronze, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤ 600			
Bronze, long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	> 600-850			
Bronze, long-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤ 850			
Bronze, long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	850-1000			

RT 100 R - Special tool request

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Contact

Customer no. New customer

Company

Street no.

Telephone

Date

Order no.

Contact

Town/post code

Fax

Signature

Solid carbide Ratio drills RT 100 R

Carbide grade

K20

Nom.-Ø d₁

Shank-Ø d₃ to DIN 6535

Shank design to DIN 6535

Drilling depth l₃

Flute length l₂

Total length l₁

Double margins

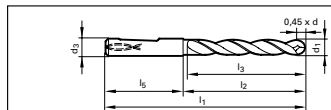
Cooling

Surface finish/coating

Workpiece material

Quantity

WITHOUT step



Relation of nom.-Ø d₁, shank-Ø d₃ and shank length l₅

nom.-Ø d₁ min/max
shank-Ø d₃
shank length l₅

4-6	>6-8	>8-10	>10-12	>12-14	>14-16	>16-18	>18-20
6	8	10	12	14	16	18	20
36	40	45	48	50			

Range	Complete
4.0 – 20.0 mm	
see table above	
HA <input type="checkbox"/> , HE <input type="checkbox"/>	
max. 7 x D (run out min. 0.01-0.02)	
max. 155 mm	
56 – 205 mm	
yes / no	
internal / external / soluble oil / minimal quantity lubrication / dry	
bright/ FIRE/MolyGlide / Super A	

Standard tolerances: nom.-Ø = m7, shank-Ø = h6

Solid carbide Ratio drills RT 100 R

Carbide grade

K20

Step-Ø d₁

Step-Ø d₂

Shank-Ø d₃ to DIN 6535

Shank form to DIN 6535

Step length l₄

Drilling depth l₃

Flute length l₂

Total length l₁

Step angle

Double margins

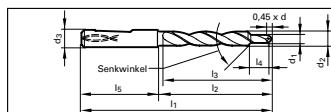
Cooling

Surface finish/coating

Workpiece material

Quantity

WITH step



Relation of nom.-Ø d₂, shank-Ø d₃ and shank length l₅

nom.-Ø d₂ min/max
shank-Ø d₃
shank length l₅

4-6	>6-8	>8-10	>10-12	>12-14	>14-16	>16-18	>18-20
6	8	10	12	14	16	18	20
36	40	45	48	50			

Range	Complete
4.0 – 20.0 mm	
4.0 – 20.0 mm	
see table above	
HA <input type="checkbox"/> , HE <input type="checkbox"/>	
5 – 100 mm	
max. 7 x D (run out min. 0.01-0.02)	
max. 155 mm	
56 – 205 mm	
60°/90°/120° / 180°	
yes / no	
internal / external / soluble oil / min. quantity lubrication / dry	
bright/ FIRE/MolyGlide / Super A	

Standard tolerances: step-Ø d₁ = m7; body-Ø d₂ = h7; shank-Ø d₃ = h6



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EXCLUSIVELINE®

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