

# GUHRING

**NEW**

Wear resistant  
coating  
TiAlN nanoA

Special carbide  
developed for  
stainless steels

Special tool geometry  
perfected for  
stainless steels



## RT 100 VA

**The easy and safe stainless steels drill!**

**Top performance in**

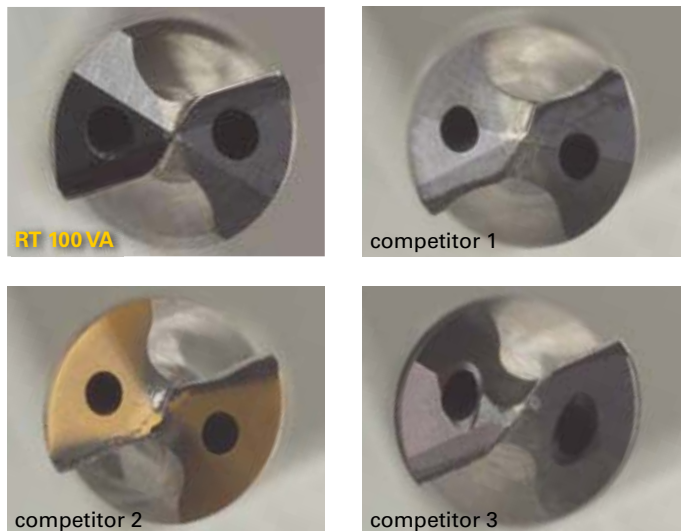
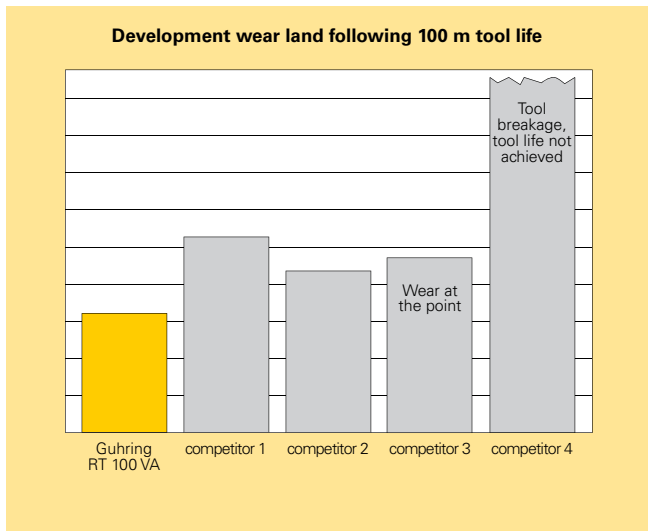
- wear
- tool life
- rigidity

Selected machining results RT 100 VA

<b>Guhring no.</b>	8510	8511	8511	8611
<b>Diameter</b>	10.6	8.0	15.0	6.8
<b>Coating</b>	TiAlN nanoA	TiAlN nanoA	TiAlN nanoA	TiAlN nanoA
<b>Material group</b>	stainless steel	stainless steel	stainless steel	stainless steel
<b>Material description</b>	X10CrNiS18-9 1.4305	X5CrNi18 10 1.4301	X6CrNiMoTi17-12-2 1.4571	X6CrNiTi1810 1.4541
<b>Drilling depth [mm]</b>	9	34	58	28
<b>Hole type</b>	blind hole	through hole	blind hole	blind hole
<b>Cooling</b>	internal	internal	internal	internal
<b>Lubricant</b>	oil	soluble oil	soluble oil	soluble oil
<b>Machine type</b>	rotary transfer machine	machining centre	machining centre	machining centre
<b>v<sub>c</sub> [mm/min]</b>	40	50	90	60
<b>f [mm/rev.]</b>	0.16	0.2	0.14	0.1
<b>Tool life [m]</b>	1800	190	63	150

**Wear development**

The RT 100 VA has demonstrated low wear in various applications against competitor tools. The graphic below shows the development of the wear land following 100 m tool life for the machining of a heat exchanger plate in stainless steel X6CrNiMoTi17-12-2 (1.4571). While Guhring's RT 100 VA shows the lowest corner wear and no wear at the point, the wear values of the competitor tools were considerably higher. In addition, they showed considerable wear at the point. A further competitor tool didn't achieve the required tool life, it failed through premature tool breakage.



## RT 100 VA

For the production of accurate holes in stainless steels with highest cutting rates and long tool life, Guhring has developed the new RT 100 VA. The RT 100 VA achieves its extraordinary efficiency thanks to

- carbide developed for the machining of stainless steels
- the TiAlN nanoA wear resistant coating
- tool geometry perfected for the machining of stainless steels

In addition, the high feed rates achievable with the RT 100 VA are thanks to the optimal heat dissipation via the chips. Additionally the highly effective coolant supply via the internal coolant ducts, having maximum cross section, supports the heat dissipation as well as chip evacuation and also counteracts the risk of localised hardening.

### The program

The RT 100 VA is available in four designs as part of the standard program:

Standard	Type	Shank form	Cooling	Cutting direction	Drilling depth	Tolerance	Tool description	Tool material	Surface finish	Diameter	Guhring no.
DIN 6537 K	RT 100 VA	HA			3xD	m7		Solid carbide	TiAlN nanoA	3,00 - 20,00	8510
DIN 6537 K	RT 100 VA	HE			3xD	m7		Solid carbide	TiAlN nanoA	3,00 - 20,00	8610
DIN 6537 L	RT 100 VA	HA			5xD	m7		Solid carbide	TiAlN nanoA	3,00 - 20,00	8511
DIN 6537 L	RT 100 VA	HE			5xD	m7		Solid carbide	TiAlN nanoA	3,00 - 20,00	8611

### Special solutions

Furthermore, we supply intermediate sizes or step drills as special tools for your specific application tasks on request. Designs are also possible for drilling depths in excess of 5xD. Complete the form on page 16 or contact us!

### Notes regarding application

A cutting speed should be chosen out of the Navigator and can greatly depend on the material composition. Machining tests are paramount for selecting the optimal cutting speed.

Due to the high cutting load particular attention must be paid to maximum rigidity of the machine as well as the workpiece and tool clamping. Always select the shortest possible tool for your machining task.

### Application recommendations for Guhring RT 100 high-performance Ratio drills

Recommendations regarding tool suitability for the following application groups can be found on the following price and program pages:

- optimal suitability
- limited suitability
- not suitable

Application group	Material examples
P	Steel, high-alloyed steel
M	Stainless steel
K	Grey cast iron, spheroidal and malleable cast iron
N	Aluminium and other non-ferrous metals
S	Special-, super- and Ti-alloys
H	Hardened steel and hard cast iron

Pictograms see page 14







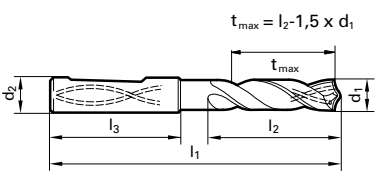
<b>DIN</b> 6537 K	<b>RT 100</b> VA	<b>3xD</b>			<b>m7</b>
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<b>HA</b>	<b>HE</b>
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**Order no. = Guhring no. + code no.**

**Guhring no.**  
P  
M  
K  
N  
S  
H

**Surface finish**  
**Discount group**



8510	8610
●	●
●	●
TiAlN nanoA	
121	121





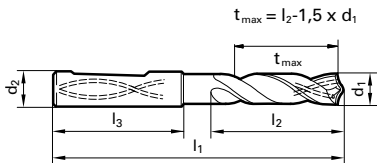
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<b>no.</b>	mm	inch	mm	mm	mm	mm
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12,700	12.700	1/2	14.000	107.000	60.000	45.000
12,800	12.800		14.000	107.000	60.000	45.000
13,000	13.000		14.000	107.000	60.000	45.000
13,300	13.300		14.000	107.000	60.000	45.000
13,500	13.500		14.000	107.000	60.000	45.000
13,700	13.700		14.000	107.000	60.000	45.000
14,000	14.000		14.000	107.000	60.000	45.000
14,200	14.200		16.000	115.000	65.000	48.000
14,290	14.290	9/16	16.000	115.000	65.000	48.000
14,300	14.300		16.000	115.000	65.000	48.000
14,500	14.500		16.000	115.000	65.000	48.000
14,700	14.700		16.000	115.000	65.000	48.000
15,000	15.000		16.000	115.000	65.000	48.000
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15,300	15.300		16.000	115.000	65.000	48.000
15,500	15.500		16.000	115.000	65.000	48.000
15,700	15.700		16.000	115.000	65.000	48.000
16,000	16.000		16.000	115.000	65.000	48.000
16,300	16.300		18.000	123.000	73.000	48.000
16,500	16.500		18.000	123.000	73.000	48.000
16,900	16.900		18.000	123.000	73.000	48.000
17,000	17.000		18.000	123.000	73.000	48.000
17,300	17.300		18.000	123.000	73.000	48.000
17,500	17.500		18.000	123.000	73.000	48.000
18,000	18.000		18.000	123.000	73.000	48.000
18,500	18.500		20.000	131.000	79.000	50.000
18,900	18.900		20.000	131.000	79.000	50.000
19,000	19.000		20.000	131.000	79.000	50.000
19,050	19.050	3/4	20.000	131.000	79.000	50.000
19,300	19.300		20.000	131.000	79.000	50.000
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DIN 6537 L	RT 100 VA	5xD			m7	Guhring no.
Order no. = Guhring no. + code no.						P
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Surface finish						
Discount group						
						
Code no.	d1 mm	d1 inch	d2 mm	l1 mm	l2 mm	l3 mm
9,000	9.000		10.000	103.000	61.000	40.000
9,100	9.100		10.000	103.000	61.000	40.000
9,130	9.130	23/64	10.000	103.000	61.000	40.000
9,200	9.200		10.000	103.000	61.000	40.000
9,250	9.250		10.000	103.000	61.000	40.000
9,300	9.300		10.000	103.000	61.000	40.000
9,400	9.400		10.000	103.000	61.000	40.000
9,500	9.500		10.000	103.000	61.000	40.000
9,520	9.520	3/8	10.000	103.000	61.000	40.000
9,600	9.600		10.000	103.000	61.000	40.000
9,700	9.700		10.000	103.000	61.000	40.000
9,800	9.800		10.000	103.000	61.000	40.000
9,900	9.900		10.000	103.000	61.000	40.000
9,920	9.920	25/64	10.000	103.000	61.000	40.000
10,000	10.000		10.000	103.000	61.000	40.000
10,100	10.100		12.000	118.000	71.000	45.000
10,200	10.200		12.000	118.000	71.000	45.000
10,300	10.300		12.000	118.000	71.000	45.000
10,320	10.320	13/32	12.000	118.000	71.000	45.000
10,400	10.400		12.000	118.000	71.000	45.000
10,500	10.500		12.000	118.000	71.000	45.000
10,600	10.600		12.000	118.000	71.000	45.000
10,700	10.700		12.000	118.000	71.000	45.000
10,800	10.800		12.000	118.000	71.000	45.000
10,900	10.900		12.000	118.000	71.000	45.000
11,000	11.000		12.000	118.000	71.000	45.000
11,100	11.100		12.000	118.000	71.000	45.000
11,110	11.110	7/16	12.000	118.000	71.000	45.000
11,200	11.200		12.000	118.000	71.000	45.000
11,300	11.300		12.000	118.000	71.000	45.000
11,400	11.400		12.000	118.000	71.000	45.000
11,500	11.500		12.000	118.000	71.000	45.000
11,600	11.600		12.000	118.000	71.000	45.000
11,700	11.700		12.000	118.000	71.000	45.000
11,800	11.800		12.000	118.000	71.000	45.000
11,900	11.900		12.000	118.000	71.000	45.000
11,910	11.910	15/32	12.000	118.000	71.000	45.000
12,000	12.000		12.000	118.000	71.000	45.000
12,200	12.200		14.000	124.000	77.000	45.000

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Pictograms see page 14

DIN 6537 L

RT 100 VA

5xD



m7

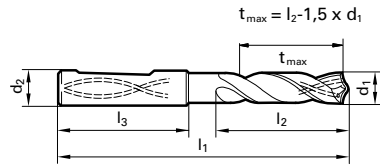
Guhring no.

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Surface finish

Discount group

Order no. = Guhring no. + code no.



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TiAlN nanoA

TiAlN nanoA

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Availability

Code no.	d1 mm	d1 inch	d2 mm	l1 mm	l2 mm	l3 mm
12,500	12.500		14.000	124.000	77.000	45.000
12,700	12.700	1/2	14.000	124.000	77.000	45.000
12,800	12.800		14.000	124.000	77.000	45.000
13,000	13.000		14.000	124.000	77.000	45.000
13,300	13.300		14.000	124.000	77.000	45.000
13,500	13.500		14.000	124.000	77.000	45.000
13,700	13.700		14.000	124.000	77.000	45.000
14,000	14.000		14.000	124.000	77.000	45.000
14,200	14.200		16.000	133.000	83.000	48.000
14,290	14.290	9/16	16.000	133.000	83.000	48.000
14,300	14.300		16.000	133.000	83.000	48.000
14,500	14.500		16.000	133.000	83.000	48.000
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15,300	15.300		16.000	133.000	83.000	48.000
15,500	15.500		16.000	133.000	83.000	48.000
15,700	15.700		16.000	133.000	83.000	48.000
16,000	16.000		16.000	133.000	83.000	48.000
16,300	16.300		18.000	143.000	93.000	48.000
16,500	16.500		18.000	143.000	93.000	48.000
16,900	16.900		18.000	143.000	93.000	48.000
17,000	17.000		18.000	143.000	93.000	48.000
17,300	17.300		18.000	143.000	93.000	48.000
17,500	17.500		18.000	143.000	93.000	48.000
18,000	18.000		18.000	143.000	93.000	48.000
18,500	18.500		20.000	153.000	101.000	50.000
18,900	18.900		20.000	153.000	101.000	50.000
19,000	19.000		20.000	153.000	101.000	50.000
19,050	19.050	3/4	20.000	153.000	101.000	50.000
19,300	19.300		20.000	153.000	101.000	50.000
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### 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 .


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


Material	Material examples, new description (further in brackets) <i>Figures in bold = material no. to DIN EN</i>	Tens. strength MPa (N/mm <sup>2</sup> )	Hardness	Coolant
Common structural steels	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 >500-850		●
Free-cutting steels	<b>1.0718</b> 11SMnPb30 (9SMn36), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 850-1000		●
Unalloyed heat-treatable steels	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤ 700 700-850 850-1000		●
Alloyed heat-treatable steels	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	850-≤1000 1000-1200		●
Unalloyed case hardened steels	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤750		●
Alloyed case hardened steels	<b>1.7043</b> 38Cr4 <b>1.5752</b> 15NiCr13 (15NiCr13), <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	850-≤1000 1000-1200		●
Nitriding steels	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≥850-≤1000 >1000-1200		●
Tool steels	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 >850-1000		●
High speed steels	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≥650-1000		●
Spring steels	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤330 HB	●
Stainless steels, sulphured austenitic martensitic	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9 <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A) <b>1.4057</b> X20CrNi 17 2 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤850 ≤850 ≤850		●
Hardened steels	-		≤40-48 HRC >48-60 HRC	●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●
Cast iron	<b>0.6010</b> EN-GJL-100(GG10), <b>0.6020</b> EN-GJL-200(GG20) <b>0.6025</b> EN-GJL-250(GG25), <b>0.6035</b> EN-GJL-350(GG35)		≤240 HB <300 HB	●
New cast materials CGI	<b>EN-GJV250 (GGV25)</b> , <b>EN-GJV350 (GGV35)</b> <b>EN-GJV400 (GGV40)</b> , <b>EN-GJV500 (GGV50)</b> , SiMo 6		≤220 HB <300 HB	●
New cast materials ADI	<b>EN-GJS-800-8 (ADI800)</b> , <b>EN-GJS-1000-5 (ADI1000)</b> <b>EN-GJS-1200-2 (ADI1200)</b> , <b>EN-GJS-1400-1 (ADI1400)</b>	800-1000 1200-1400		●
Spheroidal graphite and malleable cast iron	<b>0.7050</b> EN-GJS-500-7(GGG50), <b>0.8035</b> EN-GJMW-350-4(GTW35) <b>0.7070</b> EN-GJS-700-2(GGG70), <b>0.8170</b> EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	●
Chilled cast iron	-		≤350 HB	●
Ti and Ti-alloys	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, -TiAl8Mo1V1	≤850 >850-1200		●
Aluminium and Al-alloys	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1		≤400	●
Al wrought alloys	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5		≤450	●
Al cast iron ≤ 10 % Si > 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9 <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg		≤600 ≤600	●
Magnesium alloys	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1		≤450	●
Copper, low-alloyed	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5Zn5Pb		≤400	●
Brass, short-chipping long-chipping	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2 <b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5		≤600 ≤600	●
Bronze, short-chipping	<b>2.1090</b> CuSn7Zn5Pb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn <b>2.0790</b> CuNi18Zn19Pb		≤600 >600-850	●
Bronze, long-chipping	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2		≤850 >850-1000	●


## ≤3×D Drilling depth

## ≤5×D Drilling depth

Tool material	<b>Solid carbide</b>
Carbide grade	K
Type	RT 100 VA
Surface finish	TiAlN nanoA
Cooling	
No. DIN HA [R]	<b>8510</b>
6537 HE [R]	<b>8610</b>
for dia. range	d1 ≤ 10 mm

Tool material	<b>Solid carbide</b>
Carbide grade	K
Type	RT 100 VA
Surface finish	TiAlN nanoA
Cooling	
No. DIN HA [R]	<b>8510</b>
6537 HE [R]	<b>8610</b>
for dia. range	d1 > 10 mm

Tool material	<b>Solid carbide</b>
Carbide grade	K
Type	RT 100 VA
Surface finish	TiAlN nanoA
Cooling	
No. DIN HA [R]	<b>8511</b>
6537 HE [R]	<b>8611</b>
for dia. range	d1 ≤ 10 mm

Tool material	<b>Solid carbide</b>
Carbide grade	K
Type	RT 100 VA
Surface finish	TiAlN nanoA
Cooling	
No. DIN HA [R]	<b>8511</b>
6537 HE [R]	<b>8611</b>
for dia. range	d1 > 10 mm



V <sub>c</sub> m/min	Feed column no.	V <sub>c</sub> m/min	Feed column no.	V <sub>c</sub> m/min	Feed column no.	V <sub>c</sub> m/min	Feed column no.
80	5	80	5	80	5	80	5
60	3	90	2	60	3	90	2
80	5	80	5	80	5	80	5
30	2	30	2	30	2	30	2
35	2	35	2	35	2	35	2

## Pictograms

### Tool material

Solid  
carbide

Solid carbide finest grain (carbide-UF)

### Standard

DIN  
6537 K

DIN  
6537 L

to DIN

### Type

RT 100  
VA

### Cooling



with internal cooling

### Cutting direction



right-hand cutting

### Drilling depth

3xD

5xD

maximum drilling depth, based on the nominal diameter

### Tolerance

m7

Hole tolerance

### Shank form



to DIN 6535

**Order**       **Inquiry**

Name/customer no. if available       New customer

Street no.

Telephone

Date

Contact for questions


Order no.

Town/post code

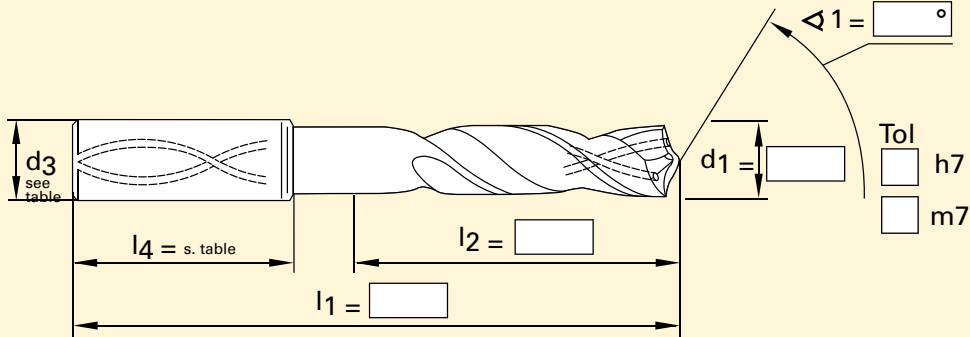
Fax

Signature

**Quantity**

**Tool type**   RT 100 VA (spiral-fluted)

**Dimensions**



$d_3$  see table

$l_4 = s. table$

$l_1 =$

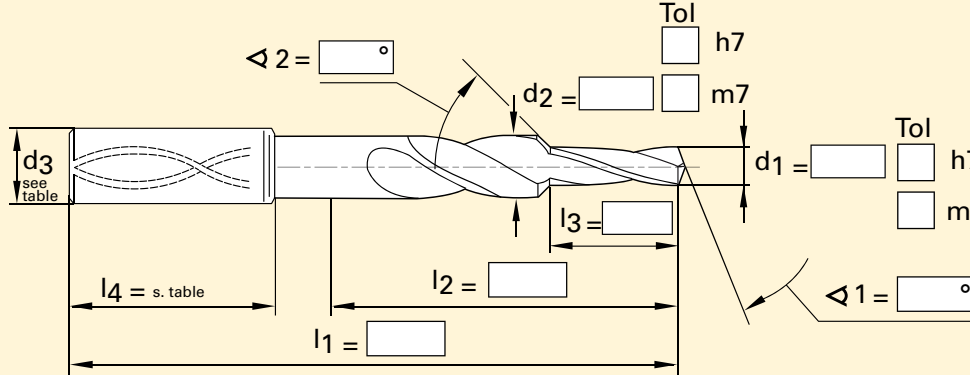
$l_2 =$

$d_1 =$

$\sphericalangle 1 =$   °

Tol  h7  m7

**Step version**



$d_3$  see table

$l_4 = s. table$

$l_1 =$

$l_2 =$

$l_3 =$

$d_2 =$

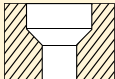
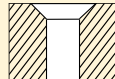
$d_1 =$



$\sphericalangle 2 =$   °

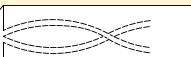

$\sphericalangle 1 =$   °

Tol  h7  m7

Tol  h7  m7

**Machining**   Drill and counterbore        Drill and chamfer

**Shank form**   HA        HE

**Internal cooling**   Yes        No

**Coating**  nanoA       bright

**Drilling**



**Tapping/thread milling/fluteless tapping**



**Reaming**



**Countersinking/de-burring**



**Milling**



**PCD/PCB**



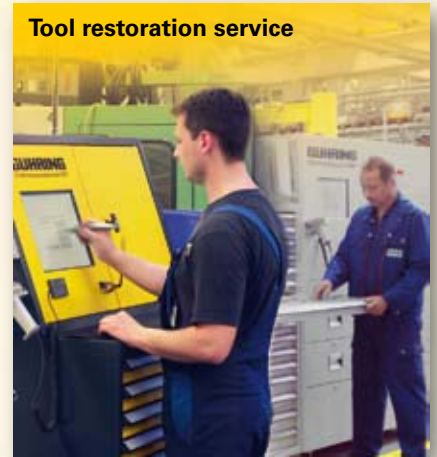
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