

# GUHRING

**NEW**

Special carbide  
developed for  
stainless steels

Wear resistant  
coating  
TiAlN nanoA

Special tool geometry  
perfected for  
stainless steels



## **RT 100 VA**

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

**Top performance in**

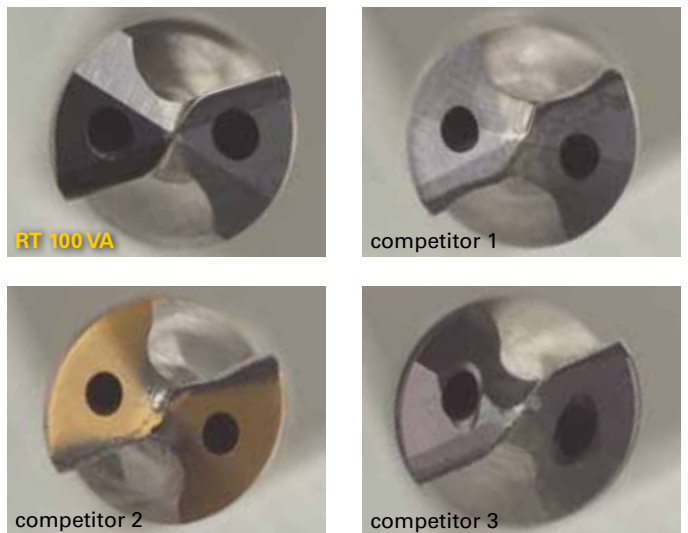
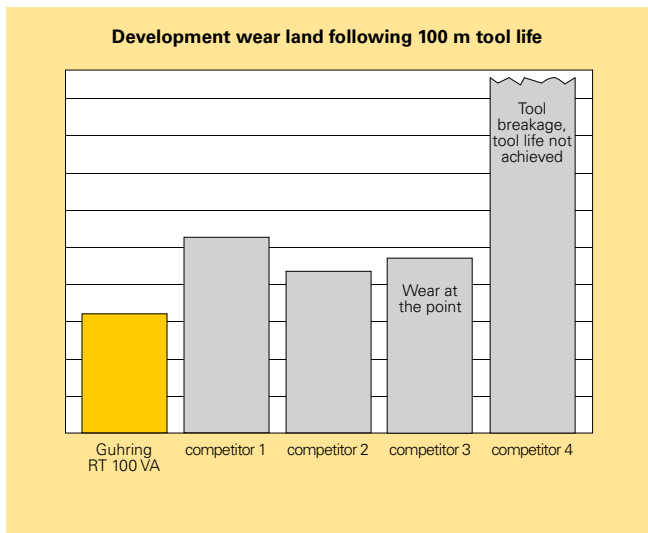
- wear
- tool life
- rigidity

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><math>v_c</math> [m/min]</b>	40	50	90	60
<b><math>f</math> [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

















### 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 further information.

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	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
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	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
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	0.630
25.00	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 (9SMnPb28), <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</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB <300 HB	●●
New cast materials ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	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-CuSn5ZnPb	≤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> CuSn7ZnPb, <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		●●



## 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

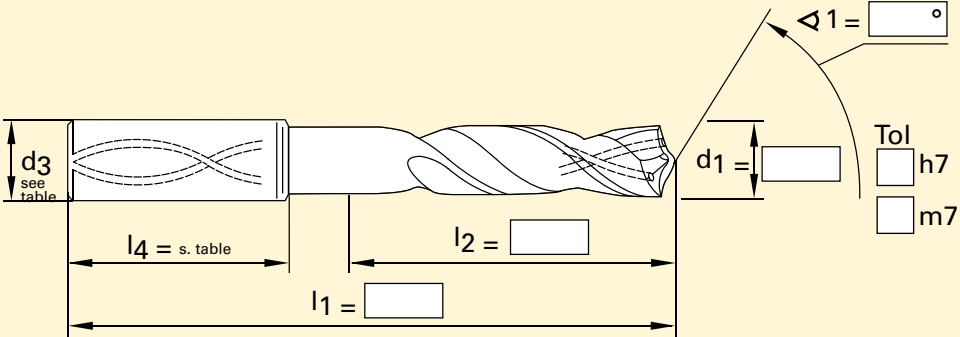
Fax

Signature

**Quantity**

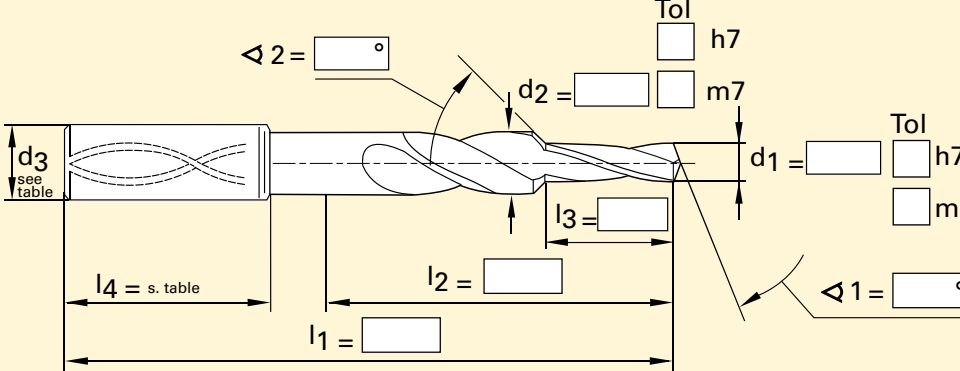
**Tool type**    
 RT 100 VA (spiral-fluted)

**Dimensions**

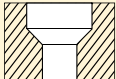




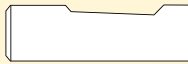
$d_3$  see table  
 $l_4 = s. table$   
 $l_1 =$    
 $l_2 =$    
 $d_1 =$    
 $\Delta 1 =$   °  
 Tol  h7  
 m7

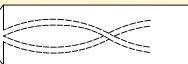

**Step version**



$d_3$  see table  
 $l_4 = s. table$   
 $l_1 =$    
 $l_2 =$    
 $l_3 =$    
 $d_2 =$    
 $d_1 =$    
 $\Delta 2 =$   °  
 $\Delta 1 =$   °  
 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**



**Modular tooling systems**



**Special tooling solutions**



**Tool restoration service**



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