

# GUHRING

The Tool Company

**NEW**



## Cutting Tools for Stainless Steels

Featuring the **NEW!** **RT 100 VA** drill

## Series 8510 (3xD), 8511 (5xD) RT 100 VA Carbide Drills

High penetration, self-centering 140° VA point, DK 460 UF carbide



- \* nano-A™ coated
- \* Reinforced straight shank
- \* Coolant through the tool



### Extended tool life plus increased productivity

Designed specifically for the challenges of cutting stainless steels

### Specialized facet-style self-centering point geometry

Promotes free cutting action, controlled chip formation

### New edge preparation technology creates ultra-precision cutting edge

Produces more accurate and consistent finish hole sizes

### Unique cutting edge and flute profile geometry

Creates short, manageable chips which are easily evacuated, enabling higher penetration rates, eliminates peck cycle in most operations

### nano-A™ heat- and wear-resistant PVD coating

Micro-thin film coating can operate at temps beyond 1470° F

Dec. inch	Diameter			Series 8510		Series 8511	
	Fract. inch	Wire / letter	mm	Overall Length	Flute Length	Overall Length	Flute Length
0.1181			3.000	62.00	20.00	66.00	28.00
0.1220			3.100	62.00	20.00	66.00	28.00
0.1248	1/8		3.170	62.00	20.00	66.00	28.00
0.1260			3.200	62.00	20.00	66.00	28.00
0.1280			3.250	62.00	20.00	66.00	28.00
0.1299			3.300	62.00	20.00	66.00	28.00
0.1339			3.400	62.00	20.00	66.00	28.00
0.1378			3.500	62.00	20.00	66.00	28.00
0.1406	9/64	28	3.570	62.00	20.00	66.00	28.00
0.1417			3.600	62.00	20.00	66.00	28.00
0.1457			3.700	62.00	20.00	66.00	28.00
0.1496		25	3.800	66.00	24.00	74.00	36.00
0.1535			3.900	66.00	24.00	74.00	36.00
0.1563	5/32		3.970	66.00	24.00	74.00	36.00
0.1575			4.000	66.00	24.00	74.00	36.00
0.1614			4.100	66.00	24.00	74.00	36.00
0.1654			4.200	66.00	24.00	74.00	36.00
0.1693			4.300	66.00	24.00	74.00	36.00
0.1720	11/64		4.370	66.00	24.00	74.00	36.00
0.1732			4.400	66.00	24.00	74.00	36.00
0.1772		16	4.500	66.00	24.00	74.00	36.00
0.1811			4.600	66.00	24.00	74.00	36.00
0.1831			4.650	66.00	24.00	74.00	36.00
0.1850			4.700	66.00	24.00	74.00	36.00
0.1874	3/16		4.760	66.00	28.00	82.00	44.00
0.1890		12	4.800	66.00	28.00	82.00	44.00
0.1929			4.900	66.00	28.00	82.00	44.00
0.1969			5.000	66.00	28.00	82.00	44.00
0.2008			5.100	66.00	28.00	82.00	44.00
0.2031	13/64		5.160	66.00	28.00	82.00	44.00
0.2047			5.200	66.00	28.00	82.00	44.00
0.2087			5.300	66.00	28.00	82.00	44.00
0.2126			5.400	66.00	28.00	82.00	44.00
0.2165			5.500	66.00	28.00	82.00	44.00
0.2185			5.550	66.00	28.00	82.00	44.00
0.2189	7/32		5.560	66.00	28.00	82.00	44.00
0.2205			5.600	66.00	28.00	82.00	44.00
0.2244			5.700	66.00	28.00	82.00	44.00
0.2283			5.800	66.00	28.00	82.00	44.00
0.2323			5.900	66.00	28.00	82.00	44.00
0.2343	15/64		5.950	66.00	28.00	82.00	44.00
0.2362			6.000	66.00	28.00	82.00	44.00
0.2402			6.100	79.00	34.00	91.00	53.00
0.2441			6.200	79.00	34.00	91.00	53.00
0.2480			6.300	79.00	34.00	91.00	53.00

Dec. inch	Diameter			Series 8510		Series 8511	
	Fract. inch	Wire / letter	mm	Overall Length	Flute Length	Overall Length	Flute Length
0.2500	1/4	E	6.350	79.00	34.00	91.00	53.00
0.2520			6.400	79.00	34.00	91.00	53.00
0.2559			6.500	79.00	34.00	91.00	53.00
0.2598			6.600	79.00	34.00	91.00	53.00
0.2638			6.700	79.00	34.00	91.00	53.00
0.2657	17/64	H	6.750	79.00	34.00	91.00	53.00
0.2677			6.800	79.00	34.00	91.00	53.00
0.2717		I	6.900	79.00	34.00	91.00	53.00
0.2756			7.000	79.00	34.00	91.00	53.00
0.2795			7.100	79.00	41.00	91.00	53.00
0.2811	9/32	K	7.140	79.00	41.00	91.00	53.00
0.2835			7.200	79.00	41.00	91.00	53.00
0.2874			7.300	79.00	41.00	91.00	53.00
0.2913			7.400	79.00	41.00	91.00	53.00
0.2953			7.500	79.00	41.00	91.00	53.00
0.2969	19/64		7.540	79.00	41.00	91.00	53.00
0.2992			7.600	79.00	41.00	91.00	53.00
0.3031			7.700	79.00	41.00	91.00	53.00
0.3071			7.800	79.00	41.00	91.00	53.00
0.3110			7.900	79.00	41.00	91.00	53.00
0.3126	5/16		7.940	79.00	41.00	91.00	53.00
0.3150			8.000	79.00	41.00	91.00	53.00
0.3189			8.100	89.00	47.00	103.00	61.00
0.3228		P	8.200	89.00	47.00	103.00	61.00
0.3268			8.300	89.00	47.00	103.00	61.00
0.3280	21/64		8.330	89.00	47.00	103.00	61.00
0.3307			8.400	89.00	47.00	103.00	61.00
0.3346			8.500	89.00	47.00	103.00	61.00
0.3386			8.600	89.00	47.00	103.00	61.00
0.3425			8.700	89.00	47.00	103.00	61.00
0.3437	11/32		8.730	89.00	47.00	103.00	61.00
0.3465			8.800	89.00	47.00	103.00	61.00
0.3504			8.900	89.00	47.00	103.00	61.00
0.3543			9.000	89.00	47.00	103.00	61.00
0.3583			9.100	89.00	47.00	103.00	61.00
0.3594	23/64		9.130	89.00	47.00	103.00	61.00
0.3622			9.200	89.00	47.00	103.00	61.00
0.3642			9.250	89.00	47.00	103.00	61.00
0.3661			9.300	89.00	47.00	103.00	61.00
0.3701			9.400	89.00	47.00	103.00	61.00
0.3740			9.500	89.00	47.00	103.00	61.00
0.3748	3/8		9.520	89.00	47.00	103.00	61.00
0.3780			9.600	89.00	47.00	103.00	61.00
0.3819			9.700	89.00	47.00	103.00	61.00
0.3858		W	9.800	89.00	47.00	103.00	61.00

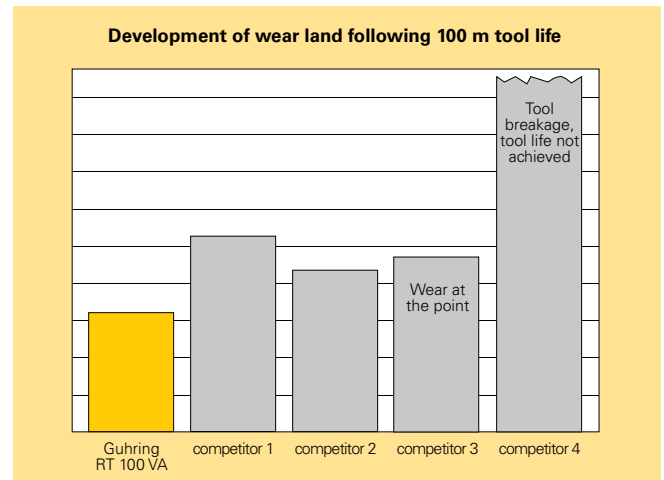
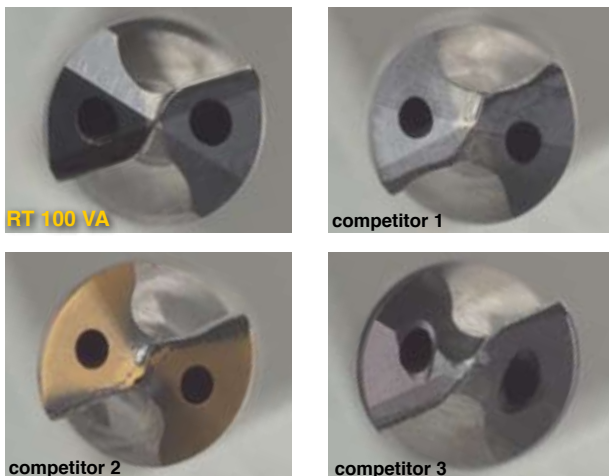
## Series 8510 (3xD), 8511 (5xD)

Dec. inch	Diameter		Series 8510		Series 8511	
	Fract. inch	Wire / letter	Overall Length	Flute Length	Overall Length	Flute Length
0.3898			89.00	47.00	103.00	61.00
0.3906	25/64		89.00	47.00	103.00	61.00
0.3937			89.00	47.00	103.00	61.00
0.3976			102.00	55.00	118.00	71.00
0.4016			102.00	55.00	118.00	71.00
0.4055			102.00	55.00	118.00	71.00
0.4063	13/32		102.00	55.00	118.00	71.00
0.4094			102.00	55.00	118.00	71.00
0.4134			102.00	55.00	118.00	71.00
0.4173			102.00	55.00	118.00	71.00
0.4213			102.00	55.00	118.00	71.00
0.4252			102.00	55.00	118.00	71.00
0.4291			102.00	55.00	118.00	71.00
0.4331			102.00	55.00	118.00	71.00
0.4370			102.00	55.00	118.00	71.00
0.4374	7/16		102.00	55.00	118.00	71.00
0.4409			102.00	55.00	118.00	71.00
0.4449			102.00	55.00	118.00	71.00
0.4488			102.00	55.00	118.00	71.00
0.4528			102.00	55.00	118.00	71.00
0.4567			102.00	55.00	118.00	71.00
0.4606			102.00	55.00	118.00	71.00
0.4646			102.00	55.00	118.00	71.00
0.4685			102.00	55.00	118.00	71.00
0.4689	15/32		102.00	55.00	118.00	71.00
0.4724			102.00	55.00	118.00	71.00
0.4803			107.00	60.00	124.00	77.00
0.4921			107.00	60.00	124.00	77.00
0.5000	1/2		107.00	60.00	124.00	77.00
0.5039			107.00	60.00	124.00	77.00

Dec. inch	Diameter		Series 8510		Series 8511	
	Fract. inch	Wire / letter	Overall Length	Flute Length	Overall Length	Flute Length
0.5118			107.00	60.00	124.00	77.00
0.5236			107.00	60.00	124.00	77.00
0.5315			107.00	60.00	124.00	77.00
0.5394			107.00	60.00	124.00	77.00
0.5512			107.00	60.00	124.00	77.00
0.5591			115.00	65.00	133.00	83.00
0.5626	9/16		115.00	65.00	133.00	83.00
0.5630			115.00	65.00	133.00	83.00
0.5709			115.00	65.00	133.00	83.00
0.5787			115.00	65.00	133.00	83.00
0.5906			115.00	65.00	133.00	83.00
0.5984			115.00	65.00	133.00	83.00
0.6024			115.00	65.00	133.00	83.00
0.6102			115.00	65.00	133.00	83.00
0.6181			115.00	65.00	133.00	83.00
0.6299			115.00	65.00	133.00	83.00
0.6417			115.00	65.00	133.00	83.00
0.6496			123.00	73.00	143.00	93.00
0.6654			123.00	73.00	143.00	93.00
0.6693			131.00	79.00	143.00	93.00
0.6811			131.00	79.00	143.00	93.00
0.6890			131.00	79.00	143.00	93.00
0.7087			131.00	79.00	143.00	93.00
0.7283			131.00	79.00	143.00	93.00
0.7441			131.00	79.00	153.00	101.00
0.7480			131.00	79.00	153.00	101.00
0.7500			131.00	79.00	153.00	101.00
0.7598			131.00	79.00	153.00	101.00
0.7677			131.00	79.00	153.00	101.00
0.7874			131.00	79.00	153.00	101.00

### Wear development

The RT 100 VA has demonstrated low wear in various applications against competitors' drills. The graphic below shows the development of the wear land following 100 meters of tool life for the drilling of a heat exchanger plate in 304 stainless steel. 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, particularly at the point. A fourth competitor tool failed through premature tool breakage.



### Drill Operating Parameters

Drill Series	Material group	Hardness	SFM	Feed Rate - IPR					
				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
8510	Stainless steels, sulphured austenitic, dia ≤10mm austenitic, dia >10mm martensitic	≤24 Rc	260	0.0031	0.0049	0.0071	0.0079	0.0098	0.0118
			195	0.0020	0.0031	0.0043			
			275				0.0039	0.0047	0.0059
	Special alloys	< 38 Rc	100	0.0016	0.0025	0.0035	0.0039	0.0049	0.0059
	Titanium and titanium alloys	< 24 Rc	115	0.0016	0.0025	0.0035	0.0039	0.0049	0.0059
8511	Stainless steels, sulphured austenitic, dia ≤10mm austenitic, dia >10mm martensitic	≤24 Rc	260	0.0031	0.0049	0.0071	0.0079	0.0098	0.0118
			195	0.0020	0.0031	0.0043			
			275				0.0039	0.0047	0.0059
	Special alloys	< 38 Rc	110	0.0016	0.0025	0.0035	0.0039	0.0049	0.0059
	Titanium and titanium alloys	< 24 Rc	115	0.0016	0.0025	0.0035	0.0039	0.0049	0.0059

### Shank Diameter info, Series 8510, 8511:

from diameter	to diameter	shank diameter =
3.0 mm	6.0 mm	6.0 mm
6.1	8.0	8.0
8.1	10.0	10.0
10.1	12.0	12.0
12.1	14.0	14.0
14.1	16.0	16.0
16.1	18.0	18.0
18.1	20.0	20.0



# Drilling

## Series 6400 (4xD), 6401 (7xD) Exclusive Line Micro Drills 140° 4-facet point, Super-A™ coated carbide M7 cut diameter tolerance

## Series 6408 (8xD), 6412 (15xD) Coolant Fed Exclusive Line Micro Drills 135° 4-facet point, TiAlN coated carbide H7 cut diameter tolerance

### Precision-ground hone

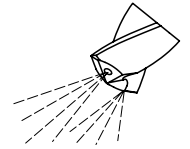
Delivers improved repeatability and extended tool life

### Gühring's own DK 460 UF ultra-fine grain carbide substrate

Ultra-fine grain carbide developed in-house for drilling abrasive materials

### Super-A™ or TiAlN heat- and wear-resistant PVD coatings

Increases tool surface hardness to over 100 Rc, provides heat resistance



Series 6408 and 6412 are coolant fed.

Minimum recommended coolant pressure is 250 - 400 psi.

Dec. inch	Diameter		mm	Series 6400		Series 6401	
	Fract. inch	Wire / letter		Overall Length	Flute Length	Overall Length	Flute Length
0.0315			0.800	47.00	4.80	47.00	6.40
0.0335			0.850	47.00	5.10	47.00	6.80
0.0354			0.900	47.00	5.40	47.00	7.20
0.0374			0.950	47.00	5.70	47.00	7.60
0.0394			1.000	47.00	6.00	47.00	8.00
0.0413			1.050	47.00	6.30	47.00	8.40
0.0433			1.100	47.00	6.60	47.00	8.80
0.0453			1.150	47.00	6.90	47.00	9.20
0.0472			1.200	47.00	7.20	52.00	10.80
0.0492			1.250	47.00	7.50	52.00	11.30
0.0512			1.300	47.00	7.80	52.00	11.70
0.0531			1.350	47.00	8.10	52.00	12.20
0.0551		54	1.400	47.00	8.40	52.00	12.60
0.0571			1.450	47.00	8.70	52.00	13.10
0.0591			1.500	47.00	9.00	52.00	13.50
0.0610			1.550	47.00	9.30	52.00	14.00
0.0626	1/16		1.590	47.00	9.60	52.00	14.40
0.0630			1.600	47.00	9.60	52.00	14.40
0.0650			1.650	47.00	9.90	52.00	14.90
0.0669		51	1.700	47.00	10.20	52.00	15.30
0.0689			1.750	47.00	10.50	52.00	15.80
0.0709			1.800	52.00	10.80	52.00	16.20
0.0728		49	1.850	52.00	11.10	52.00	16.70
0.0748			1.900	52.00	11.40	52.00	17.10
0.0768			1.950	52.00	11.70	52.00	17.60
0.0780	5/64		1.980	59.00	12.00	63.00	18.00
0.0787			2.000	59.00	12.00	63.00	18.00
0.0807			2.050	59.00	12.30	63.00	18.50
0.0827			2.100	59.00	12.60	63.00	18.90
0.0846			2.150	59.00	12.90	63.00	19.40
0.0866			2.200	59.00	13.20	63.00	19.80
0.0886			2.250	59.00	13.50	63.00	20.30
0.0906			2.300	59.00	13.80	63.00	20.70
0.0925			2.350	59.00	14.10	63.00	21.20
0.0937	3/32		2.380	59.00	14.40	63.00	21.60
0.0945			2.400	59.00	14.40	63.00	21.60
0.0965			2.450	59.00	14.70	63.00	22.10
0.0984			2.500	59.00	15.00	63.00	22.50
0.1004			2.550	59.00	15.30	63.00	23.00
0.1024			2.600	59.00	15.60	67.00	23.40
0.1043			2.650	59.00	15.90	67.00	23.90
0.1063			2.700	59.00	16.20	67.00	24.30
0.1083			2.750	59.00	16.50	67.00	24.80
0.1094	7/64		2.780	59.00	16.80	67.00	25.20
0.1102			2.800	59.00	16.80	67.00	25.20
0.1122			2.850	59.00	17.10	67.00	25.70
0.1142			2.900	59.00	17.40	67.00	26.10
0.1161		32	2.950	59.00	17.70	67.00	26.60
0.1181			3.000	59.00	18.00	67.00	27.00

Cut dia .8 mm to 1.95 mm = 3.0 mm shank dia, all others = 4.0 mm

Dec. inch	Diameter		mm	Series 6408		Series 6412	
	Fract. inch	Wire / letter		Overall Length	Flute Length	Overall Length	Flute Length
0.0551		54	1.400	52.00	15.00	62.00	25.00
0.0571			1.450	52.00	16.00		
0.0591			1.500	52.00	17.00	62.00	27.00
0.0610			1.550	52.00	17.00		
0.0626	1/16		1.590	52.00	18.00	62.00	29.00
0.0630			1.600	52.00	18.00	62.00	29.00
0.0650			1.650	52.00	18.00		
0.0669		51	1.700	56.00	19.00	70.00	31.00
0.0689			1.750	56.00	19.00		
0.0709			1.800	56.00	20.00	70.00	32.00
0.0728		49	1.850	56.00	20.00		
0.0748			1.900	56.00	21.00	70.00	34.00
0.0768			1.950	56.00	21.00		
0.0780	5/64		1.980	56.00	22.00	70.00	36.00
0.0787			2.000	56.00	22.00	70.00	36.00
0.0807			2.050	56.00	23.00		
0.0827			2.100	62.00	23.00	78.00	38.00
0.0846			2.150	62.00	24.00		
0.0866			2.200	62.00	24.00	78.00	40.00
0.0886			2.250	62.00	25.00		
0.0906			2.300	62.00	25.00	78.00	42.00
0.0925			2.350	62.00	26.00		
0.0937	3/32		2.380	62.00	26.00	78.00	44.00
0.0945			2.400	62.00	26.00	78.00	44.00
0.0965			2.450	62.00	27.00		
0.0984			2.500	62.00	28.00	78.00	45.00
0.1004			2.550	62.00	28.00		
0.1024			2.600	66.00	29.00	87.00	47.00
0.1043			2.650	66.00	29.00		
0.1063			2.700	66.00	30.00	87.00	48.00
0.1083			2.750	66.00	30.00		
0.1094	7/64		2.780	66.00	31.00	87.00	50.00
0.1102			2.800	66.00	31.00	87.00	50.00
0.1122			2.850	66.00	31.00		
0.1142			2.900	66.00	32.00	87.00	52.00
0.1161		32	2.950	66.00	32.00		
0.1181			3.000	66.00	33.00	87.00	54.00

All cut diameters have 4.0 mm shank diameter

## Drill Operating Parameters

Drill Series	Material group	Hardness	SFM	Feed Rate - IPR					
				0.0315 in. 0.800 mm	0.0394 in. 1.000 mm	0.0591 in. 1.500 mm	0.0787 in. 2.000 mm	0.0984 in. 2.500 mm	0.1181 in. 3.000 mm
6400/6401	Stainless steels, sulphured austenitic martensitic	≤24 Rc	100	0.0006	0.0009	0.0014	0.0020	0.0028	0.0035
			50	0.0003	0.0005	0.0008	0.0013	0.0018	0.0024
			100	0.0006	0.0009	0.0014	0.0020	0.0028	0.0035
6408/6412	Stainless steels, sulphured austenitic martensitic	≤24 Rc	200 - 260	0.0006	0.0009	0.0014	0.0020	0.0028	0.0035
			200	0.0003	0.0005	0.0008	0.0013	0.0018	0.0024
			200 - 260	0.0006	0.0009	0.0014	0.0020	0.0028	0.0035

## Carbide Drill Alternatives:

### Micro Drills:

**Series 6400** - Carbide micro drill, 4xD drilling depth, reinforced straight shank, Super-A™ coated, diameters from .80 - 3.0mm.

**Series 6401** - Carbide micro drill, 7xD drilling depth, Super-A™ coated, diameters from .80 - 3.0mm.

**Series 6408\*** - Coolant fed carbide micro drill, 8xD drilling depth, reinforced straight shank, TiAlN coated, dia. from 1.4 - 3.0mm.

**Series 6412** - Coolant fed carbide micro drill, 15xD drilling depth, reinforced straight shank, TiAlN coated, dia. from 1.4 - 3.0mm.

### High-Performance Carbide Drills:

**Series 5510** - RT 100 U high penetration carbide drill, 140° point, 3xD, reinforced str. shank, coolant fed, FIREX® coated, dia. from 3.0 - 20.0mm

**Series 5511** - RT 100 U high penetration carbide drill, 140° point, 5xD drilling depth, coolant fed, FIREX® coated, dia. from 3.0 - 20.0mm.

**Series 609\*** - GS 200 U three-flute high-precision carbide drill, 150° point, 5xD drilling depth, external coolant, TiN coated, dia. from 3.0 - 20.0mm

### Larger Diameter Drills:

**Series 4026 (insert)**  
**Series 4042 (3xD holder)**  
**Series 4043 (5xD holder)**  
**Series 4048 (7xD holder)**  
**Series 2485 (insert)**  
**Series 5242 (3xD holder)**  
**Series 5243 (5xD holder)**  
**Series 5248 (7xD holder)**  
 FIREX® coated carbide insert for HT800WP\* or RT800 WP style holders. Insert dia. from 11.5-14.0 mm (series 4026), or 16.0-40.5 mm (series 2485).

### Deep Hole Drills:

**Series 6511 (20xD)**  
**Series 6512 (25xD)**  
**Series 6513\* (30xD)**  
**Series 6514 (40xD)**  
 Carbide RT 100 T style drill, high penetration, coolant through, reinforced straight shank, TiAlN coated. Diameters from 3.00-14.00 mm.

## HSS/Cobalt Drill Alternatives:

### Micro Drills:

**Series 301** - High speed cobalt micro-precision drill, Type N, 118° point, drills to 4xD, bright finish, straight shank, diameters from .05 to 1.92mm.

**Series 303** - Left-hand helix high speed cobalt micro-precision drill, Type N, 118° point, drills to 4xD, bright finish, straight shank, .05 to 1.92mm.

**Series 660\*** - High speed cobalt micro-precision drill, Type N, 118° point, drills to 4xD, TiN coated, .05 to 1.92mm.

### High Performance Cobalt Drills:

**Series 329** - Heavy duty, screw machine length 3xD cobalt drill, 130° point, straight shank, oxidized, cutting diameters from 0.4 - 25.5 mm.

**Series 622\*** - GT 100 deep hole HSS drill, jobber length, 130° point, straight shank, nitrided lands, diameters from 1.0 - 13.0 mm.

**Series 5520** - Cobalt GU 500 DZ style drill, screw machine length, straight shank, self-centering split point, TiN coated. Diameters from 1.00-14.00mm.

**Series 5519\*** - Cobalt GU 500 DZ style drill, jobber length, straight shank, self-centering split point, TiN coated. Diameters from 1.00-14.00mm.

### Deep Hole Drills:

**Series 336\*** - Cobalt GT 100 style drill, 10 x D deep hole, 130° point, external coolant, straight shank, oxide finish. Diameters from 1.00-12.00mm.

**Series 618** - Cobalt GT 100 style deep hole drill, extra length #1, >10 x D, 130° point, external coolant, straight shank, nitrided lands. Diameters from 2.7-10.0mm.

## Specials Capabilities

As a leading global manufacturer of high-quality advanced design cutting tools, Guhring offers custom-designed special tooling, including multi-purpose tools for one-pass multi-diameter drilling, drill-reaming, milling and other operations.

Guhring's products and production capabilities include a broad range of high-performance high speed steel, high speed cobalt and ultra-fine grain carbide drills, taps, end mills and toolholding devices.

A **Quick Delivery** special drill program was recently launched, providing the fastest way to a high-performance special-made carbide drill. Two of our most popular drill styles are included in this program: RT 100 spiral-flute drills and RT 150 GG straight-flute drills. For either of these drill styles, within a given parameter range, quotes can be provided in 4 hours or less, and finished tools will ship within 2 weeks of receipt of order.

Quick Delivery special drills can be solid carbide or coolant fed, single diameter or step drills; and three surface finish options are available. Contact your local Authorized Guhring Distributor for details, or call Tech Support at (800) 776-6170.

## Series 515 (3xD), 530 (5xD) GT 500 DZ Powdered Metal Cobalt Drills Open parabolic flute design, 130° cone relief point



- \* FIREX coated
- \* Straight shank
- \* Tough PM cobalt substrate



**Specialized Type B 130° cone relief point geometry**  
Designed for machining tough materials

**Open GT 500 parabolic flute profile**

Provides more room for chip evacuation, eliminates need for pecking

**Powdered metal cobalt substrate**

Bridges the gap between cost-effective HSS and high-performance carbide

**FIREX® coated for maximum heat and abrasion resistance**

Dec. inch	Diameter			Series 515		Series 530	
	Fract. inch	Wire / letter	mm	Overall Length	Flute Length	Overall Length	Flute Length
0.0394			1.000	26.00	6.00	34.00	12.00
0.0402		60	1.020	26.00	6.00	34.00	12.00
0.0409		59	1.040	26.00	6.00	34.00	12.00
0.0421		58	1.070	28.00	7.00	36.00	14.00
0.0429		57	1.090	28.00	7.00	36.00	14.00
0.0433			1.100	28.00	7.00	36.00	14.00
0.0465		56	1.180	28.00	7.00	36.00	14.00
0.0469	3/64		1.190	30.00	8.00	38.00	16.00
0.0472			1.200	30.00	8.00	38.00	16.00
0.0512			1.300	30.00	8.00	38.00	16.00
0.0520		55	1.320	30.00	8.00	38.00	16.00
0.0551		54	1.400	32.00	9.00	40.00	18.00
0.0591			1.500	32.00	9.00	40.00	18.00
0.0594		53	1.510	34.00	10.00	40.00	18.00
0.0626	1/16		1.590	32.00	9.00	40.00	18.00
0.0630			1.600	34.00	10.00	43.00	20.00
0.0634		52	1.610	34.00	10.00	43.00	20.00
0.0669		51	1.700	34.00	10.00	43.00	20.00
0.0701		50	1.780	36.00	11.00	46.00	22.00
0.0709			1.800	36.00	11.00	46.00	22.00
0.0728		49	1.850	36.00	11.00	46.00	22.00
0.0748			1.900	36.00	11.00	46.00	22.00
0.0760		48	1.930	36.00	11.00	46.00	22.00
0.0780	5/64		1.980	36.00	11.00	46.00	22.00
0.0783		47	1.990	38.00	12.00	49.00	24.00
0.0787			2.000	38.00	12.00	49.00	24.00
0.0811		46	2.060	38.00	12.00	49.00	24.00
0.0819		45	2.080	38.00	12.00	49.00	24.00
0.0827			2.100	38.00	12.00	49.00	24.00
0.0858		44	2.180	40.00	13.00	53.00	27.00
0.0866			2.200	40.00	13.00	53.00	27.00
0.0890		43	2.260	40.00	13.00	53.00	27.00
0.0906			2.300	40.00	13.00	53.00	27.00
0.0933		42	2.370	43.00	14.00	57.00	30.00
0.0937	3/32		2.380	43.00	14.00	57.00	30.00
0.0945			2.400	43.00	14.00	57.00	30.00
0.0961		41	2.440	43.00	14.00	57.00	30.00
0.0980		40	2.490	43.00	14.00	57.00	30.00
0.0984			2.500	43.00	14.00	57.00	30.00
0.0996		39	2.530	43.00	14.00	57.00	30.00
0.1016		38	2.580	43.00	14.00	57.00	30.00
0.1024			2.600	43.00	14.00	57.00	30.00
0.1039		37	2.640	43.00	14.00	57.00	30.00
0.1063			2.700	46.00	16.00	61.00	33.00
0.1067		36	2.710	46.00	16.00	61.00	33.00
0.1094	7/64		2.780	46.00	16.00	61.00	33.00
0.1098		35	2.790	46.00	16.00	61.00	33.00
0.1102			2.800	46.00	16.00	61.00	33.00
0.1110		34	2.820	46.00	16.00	61.00	33.00
0.1130		33	2.870	46.00	16.00	61.00	33.00

Dec. inch	Diameter			Series 515		Series 530	
	Fract. inch	Wire / letter	mm	Overall Length	Flute Length	Overall Length	Flute Length
0.1142			2.900	46.00	16.00	61.00	33.00
0.1161		32	2.950	46.00	16.00	61.00	33.00
0.1181			3.000	46.00	16.00	61.00	33.00
0.1201		31	3.050	49.00	18.00	65.00	36.00
0.1220			3.100	49.00	18.00	65.00	36.00
0.1248	1/8		3.170	49.00	18.00	65.00	36.00
0.1260			3.200	49.00	18.00	65.00	36.00
0.1283		30	3.260	49.00	18.00	65.00	36.00
0.1299			3.300	49.00	18.00	65.00	36.00
0.1339			3.400	52.00	20.00	70.00	39.00
0.1358		29	3.450	52.00	20.00	70.00	39.00
0.1378			3.500	52.00	20.00	70.00	39.00
0.1406	9/64	28	3.570	52.00	20.00	70.00	39.00
0.1417			3.600	52.00	20.00	70.00	39.00
0.1441		27	3.660	52.00	20.00	70.00	39.00
0.1457			3.700	52.00	20.00	70.00	39.00
0.1469		26	3.730	52.00	20.00	70.00	39.00
0.1496		25	3.800	55.00	22.00	75.00	43.00
0.1520		24	3.860	55.00	22.00	75.00	43.00
0.1535			3.900	55.00	22.00	75.00	43.00
0.1539		23	3.910	55.00	22.00	75.00	43.00
0.1563	5/32		3.970	55.00	22.00	75.00	43.00
0.1571		22	3.990	55.00	22.00	75.00	43.00
0.1575			4.000	55.00	22.00	75.00	43.00
0.1591		21	4.040	55.00	22.00	75.00	43.00
0.1610		20	4.090	55.00	22.00	75.00	43.00
0.1614			4.100	55.00	22.00	75.00	43.00
0.1654			4.200	55.00	22.00	75.00	43.00
0.1661		19	4.220	55.00	22.00	75.00	43.00
0.1693		18	4.300	58.00	24.00	80.00	47.00
0.1720	11/64		4.370	58.00	24.00	80.00	47.00
0.1728		17	4.390	58.00	24.00	80.00	47.00
0.1732			4.400	58.00	24.00	80.00	47.00
0.1772		16	4.500	58.00	24.00	80.00	47.00
0.1799		15	4.570	58.00	24.00	80.00	47.00
0.1811			4.600	58.00	24.00	80.00	47.00
0.1819		14	4.620	58.00	24.00	80.00	47.00
0.1850		13	4.700	58.00	24.00	80.00	47.00
0.1874	3/16		4.760	62.00	26.00	86.00	52.00
0.1890		12	4.800	62.00	26.00	86.00	52.00
0.1909		11	4.850	62.00	26.00	86.00	52.00
0.1929			4.900	62.00	26.00	86.00	52.00
0.1937		10	4.920	62.00	26.00	86.00	52.00
0.1961		9	4.980	62.00	26.00	86.00	52.00
0.1969			5.000	62.00	26.00	86.00	52.00
0.1992		8	5.060	62.00	26.00	86.00	52.00
0.2008			5.100	62.00	26.00	86.00	52.00
0.2012		7	5.110	62.00	26.00	86.00	52.00
0.2031	13/64		5.160	62.00	26.00	86.00	52.00
0.2039		6	5.180	62.00	26.00	86.00	52.00

## Series 515 (3xD), 530 (5xD)

Dec. inch	Diameter		Series 515		Series 530	
	Fract. inch	Wire / letter	Overall Length	Flute Length	Overall Length	Flute Length
0.2047			62.00	26.00	86.00	52.00
0.2055		5	62.00	26.00	86.00	52.00
0.2087			62.00	26.00	86.00	52.00
0.2091		4	66.00	28.00	93.00	57.00
0.2126			66.00	28.00	93.00	57.00
0.2130		3	66.00	28.00	93.00	57.00
0.2165			66.00	28.00	93.00	57.00
0.2189	7/32		66.00	28.00	93.00	57.00
0.2205			66.00	28.00	93.00	57.00
0.2209		2	66.00	28.00	93.00	57.00
0.2244			66.00	28.00	93.00	57.00
0.2280		1	66.00	28.00	93.00	57.00
0.2283			66.00	28.00	93.00	57.00
0.2323			66.00	28.00	93.00	57.00
0.2339		A	66.00	28.00	93.00	57.00
0.2343	15/64		66.00	28.00	93.00	57.00
0.2362			66.00	28.00	93.00	57.00
0.2378		B	70.00	31.00	101.00	63.00
0.2402			70.00	31.00	101.00	63.00
0.2421		C	70.00	31.00	101.00	63.00
0.2441			70.00	31.00	101.00	63.00
0.2461		D	70.00	31.00	101.00	63.00
0.2480			70.00	31.00	101.00	63.00
0.2500	1/4	E	70.00	31.00	101.00	63.00
0.2520			70.00	31.00	101.00	63.00
0.2559			70.00	31.00	101.00	63.00
0.2571		F	70.00	31.00	101.00	63.00
0.2598			70.00	31.00	101.00	63.00
0.2610		G	70.00	31.00	101.00	63.00
0.2638			70.00	31.00	101.00	63.00
0.2657	17/64		70.00	31.00	101.00	63.00
0.2677			74.00	34.00	109.00	69.00
0.2717		I	74.00	34.00	109.00	69.00
0.2756			74.00	34.00	109.00	69.00
0.2768		J	74.00	34.00	109.00	69.00
0.2795			74.00	34.00	109.00	69.00
0.2811	9/32	K	74.00	34.00	109.00	69.00
0.2835			74.00	34.00	109.00	69.00
0.2874			74.00	34.00	109.00	69.00
0.2902		L	74.00	34.00	109.00	69.00
0.2913			74.00	34.00	109.00	69.00
0.2949		M	74.00	34.00	109.00	69.00
0.2953			74.00	34.00	109.00	69.00
0.2969	19/64		74.00	34.00	109.00	69.00
0.2992			79.00	37.00	117.00	75.00
0.3020		N	79.00	37.00	117.00	75.00
0.3031			79.00	37.00	117.00	75.00
0.3071			79.00	37.00	117.00	75.00
0.3110			79.00	37.00	117.00	75.00
0.3126	5/16		79.00	37.00	117.00	75.00
0.3150			79.00	37.00	117.00	75.00
0.3161		O	79.00	37.00	117.00	75.00
0.3189			79.00	37.00	117.00	75.00
0.3228		P	79.00	37.00	117.00	75.00

Dec. inch	Diameter		Series 515		Series 530	
	Fract. inch	Wire / letter	Overall Length	Flute Length	Overall Length	Flute Length
0.3268			79.00	37.00	117.00	75.00
0.3280	21/64		79.00	37.00	117.00	75.00
0.3307			79.00	37.00	117.00	75.00
0.3319		Q	79.00	37.00	117.00	75.00
0.3346			79.00	37.00	117.00	75.00
0.3386			84.00	40.00		
0.3390		R	84.00	40.00	125.00	81.00
0.3425			84.00	40.00		
0.3437	11/32		84.00	40.00	125.00	81.00
0.3465			84.00	40.00	125.00	81.00
0.3480		S	84.00	40.00	125.00	81.00
0.3504			84.00	40.00	125.00	81.00
0.3543			84.00	40.00	125.00	81.00
0.3579		T	84.00	40.00	125.00	81.00
0.3583			84.00	40.00	125.00	81.00
0.3594	23/64		84.00	40.00	125.00	81.00
0.3622			84.00	40.00	125.00	81.00
0.3661			84.00	40.00	125.00	81.00
0.3677		U	84.00	40.00	125.00	81.00
0.3681			84.00	40.00		
0.3701			84.00	40.00	125.00	81.00
0.3740			84.00	40.00	125.00	81.00
0.3748	3/8		84.00	40.00	125.00	81.00
0.3772		V	89.00	43.00	133.00	87.00
0.3780			84.00	40.00	133.00	87.00
0.3819			84.00	40.00	133.00	87.00
0.3858		W	89.00	43.00	133.00	87.00
0.3898			84.00	40.00	133.00	87.00
0.3906	25/64		89.00	43.00	133.00	87.00
0.3937			89.00	43.00	133.00	87.00
0.3969		X	89.00	43.00	133.00	87.00
0.4016			89.00	43.00	133.00	87.00
0.4039		Y	89.00	43.00	133.00	87.00
0.4063	13/32		89.00	43.00	133.00	87.00
0.4130		Z	89.00	43.00	133.00	87.00
0.4134			89.00	43.00	133.00	87.00
0.4220	27/64		89.00	43.00	133.00	87.00
0.4331			95.00	47.00	142.00	94.00
0.4374	7/16		95.00	47.00	142.00	94.00
0.4528			95.00	47.00	142.00	94.00
0.4531	29/64		84.00	40.00	142.00	94.00
0.4646			84.00	40.00		
0.4689	15/32		95.00	47.00	142.00	94.00
0.4724			102.00	51.00	151.00	101.00
0.4843	31/64		102.00	51.00	151.00	101.00
0.4921			102.00	51.00	151.00	101.00
0.5000	1/2		102.00	51.00	151.00	101.00
0.5118			102.00	51.00	151.00	101.00
0.5157	33/64		102.00	51.00	151.00	101.00
0.5311	17/32		107.00	54.00	160.00	108.00
0.5315			107.00	54.00	160.00	108.00
0.5512			107.00	54.00	160.00	108.00
0.5626	9/16		111.00	56.00	169.00	114.00

Shank Diameter info, Series 515, 530: Cutting dia. = shank dia.

Items in RED are NEW sizes - available Spring 2010

### Drill Operating Parameters

Drill Series	Material group	Hardness	SFM	Feed Rate - IPR					
				1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm
515	Stainless steels, sulphured austenitic martensitic	≤24 Rc	65	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080
			45	0.0010	0.0025	0.0040	0.0050	0.0065	0.0065
			65	0.0010	0.0025	0.0040	0.0050	0.0065	0.0065
530	Stainless steels, sulphured austenitic martensitic	≤24 Rc	65	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080
			45	0.0010	0.0025	0.0040	0.0050	0.0065	0.0065
			65	0.0010	0.0025	0.0040	0.0050	0.0065	0.0065



Detailed information and additional drill options can be found in our full-line drill catalog, or by contacting Tech Support at (800) 776-6170. Product information is also available on our website [www.guhring.com](http://www.guhring.com) on the Products & Services tab.

# Threading

## Powdered Metal Cobalt Cut Taps

2B class of fit, ANSI shank and overall length  
Blue color ring for easy identification



**Series 3907 (UNC)**  
**Series 3908 (UNF)**

Size UNC	Size UNF	No. Flutes	Approx. Limits	Order Code
4-40	4-48	3	H2/H3	2.845
5-40	5-44	3	H2/H3	3.175
6-32	6-40	3	H2/H3	3.505
8-32	8-36	3	H2/H3	4.166
10-24	10-32	3	H3/H4	4.826
12-24	12-28	3	H3/H4	5.486
1/4-20	1/4-28	3	H3/H4	6.350
5/16-18	5/16-24	3	H3/H4	7.938
3/8-16	3/8-24	3	H3/H4	9.525
7/16-14	7/16-20	3	H4/H5	11.113
1/2-13	1/2-20	4	H4/H5	12.700
9/16-12	9/16-18	4	H4/H5	14.288
5/8-11	5/8-18	4	H4/H5	15.875
3/4-10	3/4-16	4	H5/H6	19.050
7/8-9	7/8-14	4	H6/H7	22.225
1-8	1-12	4	H6/H7	25.400

- Precision ground flute form
- Premium PM cobalt substrate
- Form "B" 3.5 - 5 thread chamfer lead
- Minimal thread relief design
- Medium hook cutting geometry
- TiN coated, through hole plug tap

### Series 3906 (Metric)

Size Metric	No. Flutes	Approx. Limits	Order Code
M2 X 0.40	3	D2/D3	2.000
M3 X 0.50	3	D2/D3	3.000
M4 X 0.70	3	D3/D4	4.000
M5 X 0.80	3	D3/D4	5.000
M6 X 1.00	3	D4/D5	6.000
M8 X 1.25	3	D4/D5	8.000
M10 X 1.50	3	D4/D5	10.000
M12 X 1.75	4	D5/D6	12.000
M14 X 2.00	4	D5/D6	14.000
M16 X 2.00	4	D6/D7	16.000
M18 X 2.50	4	D6/D7	18.000
M20 X 2.50	4	D6/D7	20.000



**Series 3910 (UNC)**  
**Series 3911 (UNF)**

Size UNC	Size UNF	No. Flutes	Approx. Limits	Order Code
4-40	4-48	3	H2/H3	2.845
5-40	5-44	3	H2/H3	3.175
6-32	6-40	3	H3/H4	3.505
8-32	8-36	3	H3/H4	4.166
10-24	10-32	3	H3/H4	4.826
12-24	12-28	3	H3/H4	5.486
1/4-20	1/4-28	3	H4/H5	6.350
5/16-18	5/16-24	3	H4/H5	7.938
3/8-16	3/8-24	3	H5/H6	9.525
7/16-14	7/16-20	3	H5/H6	11.113
1/2-13	1/2-20	3	H5/H6	12.700
9/16-12	9/16-18	4	H5/H6	14.288
5/8-11	5/8-18	4	H5/H6	15.875
3/4-10	3/4-16	4	H5/H6	19.050
7/8-9	7/8-14	4	H6/H7	22.225
1-8	1-12	4	H6/H7	25.400

- Premium PM cobalt substrate
- Medium hook cutting geometry
- Precision ground flute form
- 40° helix, form "C" 2-3 thread chamfer lead
- Minimal thread relief design
- TiN coated, semi-bottoming tap

### Series 3909 (Metric)

Size Metric	No. Flutes	Approx. Limits	Order Code
M2 X 0.40	3	D2/D3	2.000
M3 X 0.50	3	D2/D3	3.000
M4 X 0.70	3	D3/D4	4.000
M5 X 0.80	3	D3/D4	5.000
M6 X 1.00	3	D4/D5	6.000
M8 X 1.25	3	D4/D5	8.000
M10 X 1.50	3	D4/D5	10.000
M12 X 1.75	3	D5/D6	12.000
M14 X 2.00	3	D5/D6	14.000
M16 X 2.00	4	D6/D7	16.000
M18 X 2.50	4	D6/D7	18.000
M20 X 2.50	4	D6/D7	20.000

## Tap Operating Parameters

Recommended Tapping Speeds - Stainless Steels			
Material Hardness		SFM	
HRC	Brinell	Bright finish	Hard coated
--	≤ 180	25 - 35	40 - 55
≤ 23	≤ 240	20 - 30	35 - 45
≤ 30	≤ 280	18 - 25	25 - 40
≤ 35	≤ 320	12 - 15	20 - 30

Suggested tap cutting fluid for stainless steel is a sulphur-based oil.  
Dry tapping is not recommended.

## Guhring Tap Compass



Guhring has marked its standard tap series with color rings to help you quickly and confidently choose the correct tool for the job. Each ring relates to the unique machining behaviors of different materials as dictated by their type and condition. Blue ring taps are your first choice for stainless steel.

Your full-line Guhring High-Performance Tap catalog has further information on this user-friendly color ring material identifier system.



# Premium Cobalt Thread Forming Taps

2BX class of fit, ANSI shank and overall length  
For blind or through hole applications



**Series 3943 (UNC), Series 3944 (UNF)**

Size UNC	Size UNF	No. Lube Grooves	Approx. Limits	Order Code
4-40	4-48	4	H4/H5	2.845
5-40	5-44	4	H4/H5	3.175
6-32	6-40	4	H5/H6	3.505
8-32	8-36	4	H5/H6	4.166
10-24	10-32	4	H6/H7	4.826
12-24	12-28	4	H6/H7	5.486
1/4-20	1/4-28	4	H7/H8	6.350
5/16-18	5/16-24	5	H8/H9	7.938
3/8-16	3/8-24	5	H8/H9	9.525
7/16-14	7/16-20	5	H9/H10	11.113
1/2-13	1/2-20	5	H10/H11	12.700
5/8-11	5/8-18	5	H11/H12	15.875
3/4-10	3/4-16	7	H12/H13	19.050

- Form "C" 2-3 thread chamfer lead
- TiCN coated thread forming tap
- Premium M35 cobalt substrate
- Optimized surface finish for long life
- Lubricant grooves across the threads

## Series 3939 (Metric)

Size Metric	No. Lube Grooves	Approx. Limits	Order Code
M4 X 0.70	4	D6/D7	4.000
M5 X 0.80	4	D7/D8	5.000
M6 X 1.00	4	D8/D9	6.000
M8 X 1.25	5	D9/D10	8.000
M10 X 1.50	5	D10/D11	10.000
M12 X 1.75	5	D11/D12	12.000
M14 X 2.00	5	D13/D14	14.000
M16 X 2.00	5	D13/D14	16.000

## Tap Operating Parameters

### Recommended Form Tapping Speeds - Stainless Steels

Material Hardness		SFM	
HRC	Brinell	Nitrided	Hard coated
--	≤ 180	100	165
≤ 20	≤ 230	80	130
≤ 25	≤ 250	65	115
≤ 30	≤ 280	50	100
≤ 35	≤ 320	30	65

### What's the correct drill size for my tap?

Guhring has an easy-to-use **Tap Drill Calculator** to help you determine the correct drill size for a given tapped hole size. The calculator can work in mm, inch or wire sizes, and returns both metric and inch drill diameter values.

Go to [www.guhring.com](http://www.guhring.com), click on the Technical tab, and the Tap Drill Calculator is the first option listed on the left-hand menu.



Detailed information and additional tap options can be found in our full-line tap catalog, or by contacting Guhring Tech Support at (800) 776-6170. Product information is also available on our website [www.guhring.com](http://www.guhring.com) on the Products & Services tab.

## Tap Alternatives:

### DIN standard plug taps:

- \* **Series 1980\*** (UNC, DIN 371) 4-40 to 3/8-16
- \* **Series 1985** (UNC, DIN 376) 1/2-13 to 1-8
- \* **Series 1990** (UNF, DIN 374) 6-40 to 3/8-24  
Cobalt plug tap, 2B class of fit, Form "B" 3.5 - 5 thread chamfer lead, bright finish
- Series 877** (Metric, DIN 371) M3x0.50 - M10x1.50
- Series 879** (Metric, DIN 376) M12x1.75 - M20x2.50
- Series 887** (Metric Fine, DIN 374) M8x1.00 - M10x1.00  
Powdered metal cobalt plug tap, 6H tolerance, Form "B" 3.5 - 5 thread chamfer lead, bright finish

### DIN standard semi-bottoming taps:

- \* **Series 909** (Metric, DIN 371) M3x0.50 - M10x1.50
- \* **Series 910\*** (Metric, DIN 376) M12x1.75 - M24x3.00
- \* **Series 936** (Metric Fine, DIN 374) M8x1.00 - M20x1.50  
Powdered metal cobalt semi-bottoming tap, 6H tolerance Form "C" 2 - 3 thread chamfer lead, 40° helix, bright finish



# Milling

## RF 100 Variable Helix End Mills

Solid carbide, RF 100 VA style designed specifically for stainless steels  
Variable helix dampens vibration, provides improved surface finish quality



### Series 3081 - RF 100 VA/NF

Cut Diameter	Shank Diameter	Length of Cut	OAL	No. Flutes	Order Code
1/4	1/4	3/4	2 1/2	4	6.350
5/16	5/16	13/16	2 1/2	4	7.940
3/8	3/8	7/8	2 1/2	4	9.520
1/2	1/2	1 1/4	3 1/2	4	12.700
5/8	5/8	1 1/4	3 1/2	4	15.870
3/4	3/4	1 1/2	4	4	19.050
1	1	1 1/2	4	4	25.400

### Roughing end mill features:

- Coarse truncated tooth profile for increased tool life
- Superior surface finish vs. conventional knuckle-type roughers
- nano-A™ coating - outstanding heat and wear resistance
- Ultra fine grain carbide
- 36°/38° variable helix design
- Shank flats on diameters from 1/2" to 1.0"



### Series 3080 - RF 100 VA

Cut Diameter	Shank Diameter	Length of Cut	OAL	No. Flutes	Order Code
3/16	3/16	5/8	2	4	4.760
1/4	1/4	3/4	2 1/2	4	6.350
5/16	5/16	13/16	2 1/2	4	7.940
3/8	3/8	1	2 1/2	4	9.520
1/2	1/2	1 1/4	3 1/2	4	12.700
5/8	5/8	1 1/4	3 1/2	4	15.870
3/4	3/4	1 1/2	4	4	19.050
1	1	1 1/2	4	4	25.400

### 4-flute multi-purpose end mill features:

- Stainless steel-specific design for higher feed rates
- Suitable for roughing and finishing, slot or periphery milling
- Chamfer edge protection for longer tool life
- nano-A™ coating - outstanding heat and wear resistance
- Shank flats on diameters from 1/2" to 1.0"
- 36°/38° variable helix design
- Ultra fine grain carbide



### Series 3115 - RF 100 SF


Cut Diameter	Shank Diameter	Length of Cut	OAL	No. Flutes	Order Code
5/16	5/16	13/16	2 1/2	6	7.940
3/8	3/8	1	2 1/2	6	9.520
1/2	1/2	1	3	6	12.700
5/8	5/8	1 1/4	3 1/2	6	15.870
3/4	3/4	1 1/2	4	6	19.050
1	1	1 1/2	4	6	25.400

### Super-finishing end mill features:

- 6-flute design with a larger, more rigid core than competitors
- Optimized flute profile for superior chip flow and feed rates
- Vibration-free; allows for exceptional surface finish
- FIREX® coating - extremely heat and wear resistant
- 44°/45°/46° variable helix design
- Ultra fine grain carbide
- Metric sizes available in series 3631


## End Mill Alternatives:

### Roughing end mills:

\*  **Series 3082\***- RF 100 U/HF variable helix roughing/finishing end mill, FIREX® coated, standard length, cut diameters from 1/4" to 1.0".


**Series 3097** - Aero-Rough 48 carbide 4-5 flute end mill. FIREX® coated, roughing cutter for materials < 48 HRC, cut diameters from 1/4" to 1.0".

### Finishing end mills:

\*  **Series 3179\***- Finish-Tech carbide 6-10 flute finishing end mill. FIREX® coated, suitable for high speed machining, cut diameters from 1/4" to 1.0".

**Series 3156** - Uni Pro carbide 4-6 flute finishing end mill. FIREX® coated, long length, cut diameters from 1/8" to 1.0".

### Ballnose end mills:

\*  **Series 3165\***- Uni Pro ballnose end mill. Carbide 4-flute end mill with FIREX® coating, cut diameters from 1/16 to 3/4". Long length version also available.

**Series 3861** - Uni Pro ballnose end mill. Carbide 4-flute end mill with Super-A™ coating, cut diameters from 1/16" to 3/4". Long length version also available.

## End Mill Operating Parameters

Values based on FIREX® coated end mill  
Adjustment for Axial DOC (Depth of Cut):  
2 x Cutter Dia. Inches per tooth (IPT) 50%  
Ramp cut reduce IPT by 30%  
Drilling reduce IPT 50%

Calculations based on the following.

Type of Cut	Radial Width of Cut (WOC)	Axial Depth of Cut (DOC)
Slot	1 x Cutter Dia.	.5 to 1.0 x Cutter Dia.
Rough	.3 to .8 x Cutter Dia.	.5 to 1.0 x Cutter Dia.
Finish	.1 to .2 x Cutter Dia.	.5 to 1.0 x Cutter Dia.



Detailed information and additional end mill options can be found in our RF 100 or full-line end mill catalogs, or by contacting Gühring Tech Support at (800) 776-6170. Product information is also available on our website [www.guhring.com](http://www.guhring.com) on the Products & Services tab.

Calculations based on the following. (Series 3115)

Type of Cut	Radial Width of Cut (WOC)	Axial Depth of Cut (DOC)
Slot		
Rough	.1 to .3 x Cutter Dia.	.5 to 1.5 x Cutter Dia.
Semi-Finish	< .1 x Cutter Dia.	.5 to 2.0 x Cutter Dia.

Series	Material	Hardness	Type of Cut	Speed SFM	Feed (inches per tooth) by tool diameter							
					1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	1.0"	
3080	Stainless Steel Easy to Machine - 416, 410, 430, 302, 303	Less than 28 HRc	Slot	180	.0006	.0011	.0015	.0020	.0024	.0030	.0040	
			Rough	250	.0008	.0014	.0019	.0025	.0030	.0038	.0050	
			Finish	450	.0009	.0017	.0023	.0030	.0036	.0045	.0060	
	Stainless Steel Moderately Difficult - 304, 316, Invar, Kovar	Less than 28 HRc	Slot	180	.0006	.0012	.0015	.0020	.0024	.0030	.0040	
			Rough	200	.0008	.0015	.0019	.0025	.0030	.0038	.0050	
			Finish	400	.0009	.0018	.0023	.0030	.0036	.0045	.0060	
Stainless Steel Difficult to Machine - 316L, 17-4 PH, 15-5 PH, 13-8 PH	Less than 38 HRc	Slot	150	.0005	.0009	.0013	.0018	.0022	.0028	.0038		
		Rough	180	.0008	.0014	.0025	.0033	.0039	.0045	.0069		
		Finish	350	.0009	.0017	.0030	.0039	.0047	.0054	.0083		
3081	Stainless Steel Easy to Machine - 416, 410, 430, 302, 303	Less than 28 HRc	Slot	160	.0010	.0014	.0018	.0022	.0027	.0036		
			Rough	225	.0012	.0017	.0023	.0027	.0034	.0045		
			Finish	400	.0015	.0020	.0027	.0032	.0041	.0054		
	Stainless Steel Moderately Difficult - 304, 316, Invar, Kovar	Less than 28 HRc	Slot	160	.0011	.0014	.0018	.0022	.0027	.0036		
			Rough	180	.0014	.0017	.0023	.0027	.0034	.0045		
			Finish	360	.0016	.0020	.0027	.0032	.0041	.0054		
Stainless Steel Difficult to Machine - 316L, 17-4 PH, 15-5 PH, 13-8 PH	Less than 38 HRc	Slot	135	.0008	.0012	.0016	.0020	.0025	.0034			
		Rough	160	.0012	.0023	.0029	.0035	.0041	.0062			
		Finish	320	.0015	.0027	.0035	.0042	.0049	.0074			
3115	Stainless Steel Easy to Machine - 416, 410, 430, 302, 303	Less than 28 HRc	Slot	250	.0008	.0014	.0019	.0025	.0030	.0038	.0050	
			Rough	450	.0009	.0017	.0023	.0030	.0036	.0045	.0060	
			Finish	450	.0009	.0017	.0023	.0030	.0036	.0045	.0060	
	Stainless Steel Moderately Difficult - 304, 316, Invar, Kovar	Less than 28 HRc	Slot	200	.0008	.0015	.0019	.0025	.0030	.0038	.0050	
			Rough	400	.0009	.0018	.0023	.0030	.0036	.0045	.0060	
			Finish	400	.0009	.0018	.0023	.0030	.0036	.0045	.0060	
Stainless Steel Difficult to Machine - 316L, 17-4 PH, 15-5 PH, 13-8 PH	Less than 38 HRc	Slot	180	.0008	.0014	.0025	.0033	.0039	.0045	.0069		
		Rough	350	.0009	.0017	.0030	.0039	.0047	.0054	.0083		
		Finish	350	.0009	.0017	.0030	.0039	.0047	.0054	.0083		

# Reconditioning

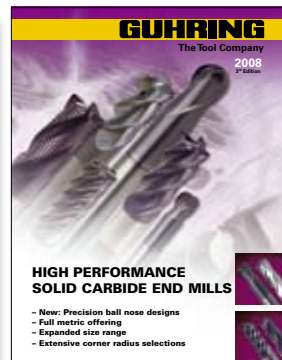
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- High-precision CNC grinding machines
- Personalized customer service
- Reconditioning and coating at one facility
- Two U.S. locations; quick turnaround



*For product details and the full offering of Guhring high-performance cutting tools, please see our full-line drill, tap and end mill catalogs:*



**Don't forget to visit the newly renovated [www.guhring.com](http://www.guhring.com)**

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