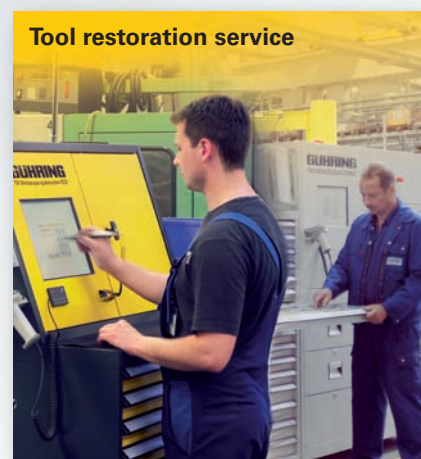




GUHRING

NEW:
RT 100 VA
The specialist for
Stainless Steels



GUHRING

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SUPERLINE

The new dimension for
economic machining

7th Edition





WHAT IS SUPERLINE?

SuperLine is the optimal range of high-tech tools for machining the following operations

- drilling
- tapping
- milling
- reaming

SL

... IN QUALITY

SL quality – offers highest accuracy and process reliability! This is the result of our major investment. Therefore the new manufacturing procedures have been implemented according to DIN ISO 9001 and VDA 6.4. This is what our employees are trained for.

All SL tools are produced in ultra fine Guhring carbide or carefully selected high performance high speed steel. Add to this a majority coating with our well proven, versatile multilayer FIRE coating or application orientated surface finishes from bright to TiCN or TiAlN nanoA.

The efficiency of tool material and coating complement the proven and tested cutting edge geometries.





... IN AVAILABILITY

Excellent availability of SL-tools from stock, i.e. call or fax today and apply tomorrow, this is our SL motto. It must be experienced to be believed – on a daily basis.

PER



... IN COST-EFFICIENCY

We produce SL-tools in large batches on completely new precision grinding machines developed by us. The extremely high productivity achieved with this manufacturing concept brings cost advantages that are fully passed on to our customers. Added to the guaranteed high SL quality, you will gain cost-efficiency that cannot be matched.



SUPER

... IN TOOL LIFE

We support our SL-tools beyond the initial sale and the successful application. We look after SL-tools for their entire life. Regrinding and recoating – all this is part of our service. And who is more competent than the tool manufacturer?!

The tools can be sent to us by courier or our own logistics service can collect and deliver the tools.

We are convinced, that the SuperLine program is the best offer at the right time. Test the quality, compare the prices. Take advantage of the exceptional advantages of SuperLine.

WORN



REGRINDING



RECOATING



SL range summary

SL drills

Summary	page 6
Standard range	page 14
GuhringNavigator	page 40

SL milling cutters

Summary	page 8
Standard range	page 44
GuhringNavigator	page 62

SL taps and fluteless taps

Summary	page 10
Standard range	page 66

SL reamers

Summary	page 11
Standard range	page 75
GuhringNavigator	page 78

Ordering possibilities

Standard range

Tools from the standard range are illustrated in **bold** in this catalogue. For most cutting tasks they provide an extremely economical solution. They are available immediately.

Obsolete range

Products that have small or no demand are listed in our obsolete range and illustrated in light in the catalogue. They are available only as long as the product is in stock. If products from the obsolete range are out of stock, production readiness with short delivery is provided in the form of a special tool order. Prices available on request.

Packaging detail

Tool group	Standard	Units per package
Solid carbide twist drills	all DIN standards and Guhring standards	all sizes supplied 1 unit per package
Solid carbide milling cutters and reamers	all DIN standards and Guhring standards	all sizes supplied 1 unit per package
High speed steel twist drills	DIN 1897 DIN 338	≤ 7.5 mm packed in units of 10 > 7.5 ... 10.6 mm packed in units of 5 > 10.6 mm 1 unit per package
High speed steel taps and fluteless taps	DIN 371	≤ M6 packed in units of 10 > M6 1 unit per package

SL drills

Ratio drills

Standard (DIN)	Type	Shank form	Drilling depth	Tool illustration	Tool material	Carbide grade	Surface	Internal cooling	Ø-range mm	Guhr. no.	Page
DIN 6537 short	RT100 U	HA	3 x D		Carb.-UF	K/P	F	–	3.00...20.00	5514	14
	RT100 U	HE					F	–	3.00...16.00	5614	14
	RT100 U	HA					F		3.00...20.00	5510	14
	RT100 U	HE					F		3.00...20.00	5610	14
	RT100 VA	HA		 			a		3.00...20.00	8510	14
	RT100 VA	HE		 			a		3.00...20.00	8610	14
DIN 6537 long	RT100 U	HA	5 x D		Carb.-UF	K/P	F	–	3.00...20.00	5515	18
	RT100 U	HE					F	–	3.00...16.00	5615	18
	RT100 U	HA					F		3.00...20.00	5511	18
	RT100 U	HE					F		3.00...20.00	5611	18
	RT100 VA	HA		 			a		3.00...20.00	8511	18
	RT100 VA	HE		 			a		3.00...20.00	8611	18
Guhring std.	RT100 U	HA	7 x D		Carb.-UF	K/P	F		4.00...20.00	5512	23
		HE							4.00...20.00	5612	23
Guhring std.	RT100	HA	12 x D		Carb.-UF	K/P	F		4.00...20.00	5525	25
Guhring std.	RT150 GG	HA	10 x D		Carb.-UF	K			3.00...16.00	5513	28

3-flute Ratio drills

DIN 6537 long	FT200	HA	5 x D		Carb.-UF	K		–	3.00...20.00	5518	29
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SL drills

Carbide twist drills

Standard (DIN)	Type	Shank form	Drilling depth	Tool illustration	Tool material	Carbide grade	Surface	Internal cooling	Ø-range mm	Guhr. no.	Page
DIN 6539	N	–	3 x D		Carb.-UF	K	○	–	2.00...12.00	5516	31
Guhring std.	N	–	5 x D		Carb.-UF	K	○	–	2.00...12.00	5517	32

High speed steel twist drills

DIN 1897	GU500 DZ	–	3 x D		HSCO	–	○	–	1.00...14.00	5524	33
	GU500 DZ	–	3 x D		HSCO	–	Ⓢ	–	1.00...14.00	5520	33
	GT500 DZ	–	3 x D		PM HSS-E	–	Ⓢ	–	1.00...14.00	5521	33
DIN 338	GU500 DZ	–	5 x D		HSCO	–	○	–	1.00...14.00	5523	36
	GU500 DZ	–	5 x D		HSCO	–	Ⓢ	–	1.00...14.00	5519	36
	GT500 DZ	–	5 x D		PM HSS-E	–	Ⓢ	–	1.00...14.00	5522	36
DIN 338	GU500 DZ	–	5 x D	Sets of Guhring no. 5523	HSCO	–	○	–	–	201	39

SL range summary

SL milling cutters

Ratio end mills RF 100

DIN	Form	Type	Tolerance on cutting-Ø	Tool illustration	No. of cutting edges	Tool material	Carbide grade	Surface	Ø-range mm	Guhr. no.	Page
DIN 6537 short	HB	N	h10		4-fluted	Carb.-UF	K/P	F	6.00...20.00	5534	44
DIN 6527 long	HA	N	h10		4-fluted	Carb.-UF	K/P	F	4.00...25.00	5735	45
DIN 6527 long	HB	N	h10		4-fluted	Carb.-UF	K/P	F	4.00...25.00	5535	45
Guhring std.	HA	N	h10		4-fluted	Carb.-UF	K/P	F	10.00...25.00	5582	46

Mini-Slot drills

Guhring std. short	–	N	h10		3-fluted	Carb.-UF	K/P	F	0.50...20.00	5573	47
Guhring std. short	–	N	h10		3-fluted	Carb.-UF	K/P	F	1.00...10.00	5574	48

Slot drills and ball nose slot drills (2-fluted)

DIN 6527 long	HA	N	h10		2-fluted	Carb.-UF	K/P	F	0.50...20.00	5585	49
DIN 6527 long	HB	N	h10		2-fluted	Carb.-UF	K/P	F	4.00...12.00	5533	49
DIN 6527 long	HA	N	h10		2-fluted	Carb.-UF	K/P	F	2.00...20.00	5730	50
DIN 6527 long	HB	N	h10		2-fluted	Carb.-UF	K/P	F	2.00...20.00	5530	50
Guhring std.	HA	N	h10		2-fluted	Carb.-UF	K/P	F	3.00...20.00	5549	51
DIN 6527 short	HA	W	e8		2-fluted	Carb.-UF	K	○	3.00...20.00	5742	51
DIN 6527 short	HB	W	e8		2-fluted	Carb.-UF	K	○	3.00...20.00	5542	51
DIN 6527 long	HA	W	e8		2-fluted	Carb.-UF	K	○	3.00...20.00	5743	52
DIN 6527 long	HB	W	e8		2-fluted	Carb.-UF	K	○	3.00...20.00	5543	52

GuhringNavigator milling cutters

○ bright F FIRE

SL milling cutters

Slot drills (3-fluted)

DIN	Form	Type	Tolerance on cutting-Ø	Tool illustration	No. of cutting edges	Tool material	Carbide grade	Surface	Ø-range mm	Guhr. no	Page
DIN 6527 short	HA	NH	h10		3-fluted	Carb.-UF	K/P	F	3.00...20.00	5505	53
DIN 6527 short	HB	NH	h10		3-fluted	Carb.-UF	K/P	F	3.00...20.00	5502	53
DIN 6527 long	HA	N	h10		3-fluted	Carb.-UF	K/P	F	2.00...20.00	5507	54
DIN 6527 long	HB	N	h10		3-fluted	Carb.-UF	K/P	F	2.00...20.00	5531	54
DIN 6527 long	HA	NH	h10		3-fluted	Carb.-UF	K/P	F	3.00...20.00	5506	55
DIN 6527 long	HB	NH	h10		3-fluted	Carb.-UF	K/P	F	3.00...20.00	5546	55
DIN 6527 long	HB	WR	h10		3-fluted	Carb.-UF	K	○	8.00...20.00	5544	55

End mills

DIN 6527 long	HB	N	h10		4-fluted	Carb.-UF	K/P	F	3.00...20.00	5584	56
DIN 6527 long	HB	N	h10		4-fluted	Carb.-UF	K/P	F	2.00...20.00	5532	57
Guhring std. short	HA	N	h10		4-fluted	Carb.-UF	K/P	F	3.00...20.00	5556	58
DIN 6527 long	HA	NH	h10		multi-fluted	Carb.-UF	K/P	F	3.00...25.00	5745	59
DIN 6527 long	HB	NH	h10		multi-fluted	Carb.-UF	K/P	F	6.00...20.00	5545	59
Guhring std.	HA	NH	h10		multi-fluted	Carb.-UF	K/P	F	6.00...20.00	5729	60
Guhring std.	HB	NH	h10		multi-fluted	Carb.-UF	K/P	F	6.00...20.00	5529	60
DIN 6527 long	HB	NRf	h10		4-fluted	Carb.-UF	K/P	F	6.00...20.00	5504	61
DIN 6527 long	HB	HR	h10		4-fluted	DK 500-UF	K/P	F	6.00...20.00	5583	61

SL machine taps



for through holes

DIN	Type	Form	Tolerance zone	Tool illustration and colour ring code	Tool material	Surface	Thread range	Gühring no.	Page
DIN 371	N	B	ISO 2 / 6H	 	HSS-E		M3 ... M10	5560	66
DIN 371	N	B	ISO 2 / 6H	 	HSS-E		M3 ... M8	5590	66
DIN 371	H	B	ISO 2 / 6H	 	HSS-E		M3 ... M10	5558	66
DIN 371	H	B	ISO 2 / 6H	 	HSS-E		M3 ... M10	5587	66
DIN 371	VA	B	ISO 2 / 6H	 	PM HSS-E		M3 ... M10	5559	66
DIN 371	VA	B	ISO 2 / 6H	 	HSS-E		M3 ... M10	5588	66
DIN 371	N	B	ISO 2 / 6H	 	HSS-E		M3 ... M10	5561	67
DIN 371	N	B	ISO 2 / 6H	 	HSS-E		M3 ... M10	5586	67
DIN 371	AI	B	ISO 2 / 6H	 	HSS-E		M3 ... M10	5557	67
DIN 371	GG	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5550	67
DIN 371	GG	C	6HX	 	HSS-E		M3 ... M10	5595	67
DIN 376	N	B	ISO 2 / 6H	 	HSS-E		M12 ... M20	5563	68

SL Fluteless Taps for through and blind holes

~DIN 371	N	C	6HX		HSS-E		M3 ... M10	5598	69
~DIN 376	N	C	6HX		HSS-E		M12 ... M16	5599	70

 bright
  steam tempered
  nitrided
  TiAlN
  TiCN
  TiN

SL machine taps



for blind holes

DINs	Type	Form	Tolerance zone	Tool illustration and colour ring code	Tool material	Surface	Thread range	Guhring no.	Page
DIN 371	N R40	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5554	71
DIN 371	N R40	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5592	71
DIN 371	N R40	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5552	71
DIN 371	N R40	C	ISO 2 / 6H	 	HSS-E		M3 ... M8	5591	71
DIN 371	VA R40	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5553	72
DIN 371	VA R40	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5596	72
DIN 371	N R40	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5555	72
DIN 371	N R40	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5594	72
DIN 371	AI R45	C	ISO 2 / 6H	 	HSS-E		M3 ... M10	5551	72
DIN 376	N R40	C	ISO 2 / 6H	 	HSS-E		M12 ... M20	5589	73
DIN 371	H	C	ISO 2 / 6H	  IC ≥ M5	Carb.-UF		M4 ... M10	5593	74

SL reamers

Guhring std.					Carb.-UF		0.98 ... 12.05	5527	75
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 for cast-materials
  for Al and Al-alloys
  for high tensile mat. 800...1200 N/mm²
 for stainless and acid resistant steels
  for general steels ≤ 800 N/mm²
 for universal applications ≤ 1000 N/mm²

SL program drilling tools range of application

Ratio drills

Type RT 100 U



For the drilling of long- and short-chipping materials such as structural and case hardened steels, cast steels, heat-treatable steels and alloyed steels with a tensile strength of up to app. 1200 N/mm², including carbon steels, bronze, cast iron and high-alloyed AlSi-alloys.

Highest speed and feed rates possible (see Guroguide). High alignment accuracy with small diameter tolerance and excellent surface finish. Excellent self-centering qualities as well as producing short chips thanks to a concave cutting point geometry with special point geometry and web thinning.

Pre-conditions for use

Powerful machines, no play in spindle bearings, alignment accurate tool holders. Max. concentricity error of clamped tools: 0.02 mm. Chatterfree, mechanical feeds.

Ratio drills with internal cooling are also available with straight shank but without whistle notch flats for the application in hydraulic chucks.

Ratio drills

Type RT 150 GG



For the drilling of short-chipping materials such as cast iron, grey cast iron, spheroidal graphite and malleable cast iron, Al-alloys with high Si content.

For the production of holes with high alignment accuracy (minimal deviation from straightness).

The tools have extremely good self-centering qualities, achieve hole tolerances to H7 and produce an excellent surface finish. High cutting rates offer high productivity.

Ratio drills

Type 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.

Ratio drills

Type RT 100 12 x D



A high performance solid carbide drill for the efficient production of deep holes in steel, cast iron and non-ferrous metals. Excellent self-centering qualities thanks to special point grind. Provides safe chip flow even with tough and long-chipping materials due to adapted drill profile and large flute space. Double margins for excellent hole alignment and with good surface qualities and optimal support of the tool during withdrawal.

Pre-conditions for use

Powerful machines. No play in spindle bearings. Alignment accurate tool holders. Max. concentricity error of clamped tools: 0.02 mm. Chatter-free, mechanical feeds.

The drills, 12 x D with internal cooling, are available with straight shank and without drive flat for the application with hydraulic chucks and shrink fit chucks.

3-fluted Ratio drills

Type FT 200

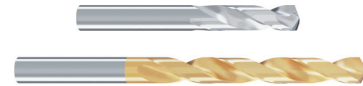


A tool for drilling from the solid, achieving holes with excellent positional and form accuracy. Dimensional accuracy and surface finish correspond to those achieved with core drills. Centering or spotting is not normally required. Suitable for drilling cast iron and long-chipping Al-alloys. The 3-fluted FT 200 enables very high feed rates and optimal centering for the machining of cast iron and aluminium.

The open flute form in conjunction with the short compact design, as well as our ultra fine carbide grade achieve maximum process reliability and enable applications under the most difficult of conditions, as for example oblique entry or interrupted drilling.

High speed steel twist drills

Type GU 500 DZ



For all those multiple machining tasks generally requiring the application of different drills, Guhring has introduced a universal drill, GU 500.

GU 500 is suitable for the machining of non-ferrous metals, structural steels and carbon steels, high-alloyed steels, cast iron and cast alloys, plastics as well as aluminium.

Solid carbide twist drills

Type N



The tools are especially suitable for drilling cast steels, grey cast iron, chilled cast iron, austenitic manganese steels, bronzes, light metals and nonferrous metals. Furthermore suitable for the economic machining of abrasive materials (AlSi-alloys), fibre-reinforced plastics and other Duroplastics liable to cause severe abrasion on cutting lips and lands. The extremely rigid, extra short SL twist drill (Guhring no. 5516) is furthermore especially recommended for the application on CNC machines and capstan lathes.

High speed steel twist drills

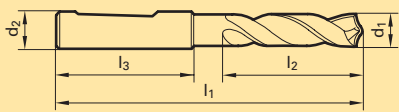
Type GT 500 DZ



The new GT 500 drill has been especially designed for the machining of high tensile steels and is produced in highly efficient **PM-steel**. By combining the advantages of high speed steel drills with those of solid carbide drills, it closes the gap that has existed for the machining of medium tensile steels and medium batch sizes.

SL program Drilling Tools

Ratio drills, right-hand cutting

Tool material	Carbide-UF		Carbide-UF		Carbide-UF																											
Carbide grade	K/P		K/P		K/P																											
Guhring no.	5514	5614	5510	5610	8510	8610																										
Type	RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 VA	RT 100 VA																										
Shank form	HA	HE	HA	HE	HA	HE																										
Surface finish	F	F	F	F	a	a																										
Drilling depth	3 x D	3 x D	3 x D	3 x D	3 x D	3 x D																										
Coolant ducts	–	–																														
Ø-range mm 3.00 ... 6.00																																
																																
																																
																																
<table><tr><th colspan="3">Diameter</th><th colspan="3">Lengths</th></tr><tr><th>nominal Ø</th><th>shank Ø</th><th></th><th>total</th><th>flute</th><th>shank</th></tr><tr><th>d1m7</th><th>d2</th><th></th><th>length</th><th>length</th><th>length</th></tr><tr><th>inch</th><th>mm</th><th>mm</th><th>l1</th><th>l2</th><th>l3</th></tr></table>			Diameter			Lengths			nominal Ø	shank Ø		total	flute	shank	d1m7	d2		length	length	length	inch	mm	mm	l1	l2	l3	Unit price in £		Unit price in £		Unit price in £	
Diameter			Lengths																													
nominal Ø	shank Ø		total	flute	shank																											
d1m7	d2		length	length	length																											
inch	mm	mm	l1	l2	l3																											
1/8	3.00	6	62	20	36	20.18	21.06	25.47	26.24	50.30	51.78																					
	3.10					20.18	21.06	25.47	26.24	53.96	55.42																					
	3.17					20.18	21.06	25.47	26.24	53.96	55.42																					
	3.20					20.18	21.06	25.47	26.24	53.96	55.42																					
	3.25					20.18	21.06	25.47	26.24	53.96	55.42																					
9/64	3.30					20.18	21.06	25.47	26.24	53.96	55.42																					
	3.40					20.18	21.06	25.47	26.24	53.96	55.42																					
	3.50					20.18	21.06	25.47	26.24	53.96	55.42																					
	3.57					20.18	21.06	25.47	26.24	53.96	55.42																					
	3.60					20.18	21.06	25.47	26.24	53.96	55.42																					
5/32	3.70		62	20		20.18	21.06	25.47	26.24	53.96	55.42																					
	3.80		66	24		20.18	21.06	25.47	26.24	53.96	55.42																					
	3.90					20.18	21.06	25.47	26.24	53.96	55.42																					
11/64	3.97					20.18	21.06	25.47	26.24	53.96	55.42																					
	4.00					20.18	21.06	27.56	28.78	54.68	56.87																					
	4.10					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.20					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.30					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.37					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.40					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.50					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.60					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.65					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.70			24		20.18	21.06	27.56	28.78	58.31	60.51																					
3/16	4.76			28		20.18	21.06	27.56	28.78	58.31	60.51																					
	4.80					20.18	21.06	27.56	28.78	58.31	60.51																					
	4.90					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.00					20.18	21.06	27.56	28.78	54.68	56.87																					
13/64	5.10					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.16					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.20					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.30					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.40					20.18	21.06	27.56	28.78	58.31	60.51																					
7/32	5.50					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.55					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.56					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.60					20.18	21.06	27.56	28.78	58.31	60.51																					
15/64	5.70					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.80					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.90					20.18	21.06	27.56	28.78	58.31	60.51																					
	5.95					20.18	21.06	27.56	28.78	58.31	60.51																					
	6.00	6	66	28	28	20.18	21.06	27.56	28.78	54.68	56.87																					

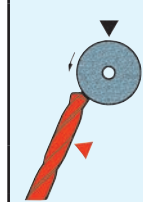
Regrinding and recoating



Net price per piece

15.24

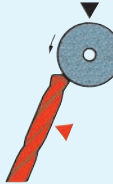
Regrinding ▼
and recoating ▼



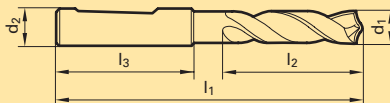
Net price per piece

15.24

F FIRE **a** TiAlN nanoA ■ tool with internal cooling

		Tool material		Carbide-UF		Carbide-UF		Carbide-UF		Regrinding and recoating  Net price per piece 19.20	
		Carbide grade		K/P		K/P		K/P			
		Guhring no.		5514 5614		5510 5610		8510 8610			
		Type		RT 100 U RT 100 U		RT 100 U RT 100 U		RT 100 VA RT 100 VA			
		Shank form		HA HE		HA HE		HA HE			
		Surface finish		F F		F F		a a			
		Drilling depth		3 x D 3 x D		3 x D 3 x D		3 x D 3 x D			
		Coolant ducts		- -		 		 			
Ø-range mm 6.10 ... 9.30											
						 		 		 	
						Unit price in £		Unit price in £		Unit price in £	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
1/4						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
17/64						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03		68.53 70.70	
						20.18 21.06		37.38 39.03			

Ratio drills, right-hand cutting

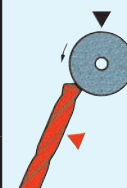
Tool material		Carbide-UF		Carbide-UF		Carbide-UF		Regrinding and recoating			
Carbide grade		K/P		K/P		K/P					
Guhring no.		5514	5614	5510	5610	8510	8610				
Type		RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 VA	RT 100 VA				
Shank form		HA	HE	HA	HE	HA	HE				
Surface finish		F	F	F	F	a	a				
Drilling depth		3 x D	3 x D	3 x D	3 x D	3 x D	3 x D				
Coolant ducts		–	–								
Ø-range mm											
9.40 ... 12.80											
											
Diameter			Lengths			Unit price in £		Unit price in £		Unit price in £	
nominal Ø	shank Ø		total	flute	shank						
d1m7	d2		length	length	length						
inch	mm		l1	l2	l3						
3/8	9.40	10	89	47	40	22.61	23.93	41.90	43.55	79.46	83.12
	9.50					22.61	23.93	41.90	43.55	79.46	83.12
	9.52					22.61	23.93	41.90	43.55	79.46	83.12
	9.60					22.61	23.93	41.90	43.55	79.46	83.12
	9.70					22.61	23.93	41.90	43.55	79.46	83.12
	9.80					22.61	23.93	41.90	43.55	79.46	83.12
25/64	9.90					22.61	23.93	41.90	43.55	79.46	83.12
	9.92					22.61	23.93	41.90	43.55	79.46	83.12
	10.00	10	89	47	40	22.61	23.93	41.90	43.55	79.46	75.82
13/32	10.10	12	102	55	45	33.74	35.18	59.98	62.52	110.09	112.99
	10.20					33.74	35.18	59.98	62.52	110.09	112.99
	10.30					33.74	35.18	59.98	62.52	110.09	112.99
	10.32					33.74	35.18	59.98	62.52	110.09	112.99
	10.40					33.74	35.18	59.98	62.52	110.09	112.99
27/64	10.50					33.74	35.18	59.98	62.52	110.09	112.99
	10.60					33.74	35.18	59.98	62.52	110.09	112.99
	10.70					33.74	35.18	59.98	62.52	110.09	112.99
	10.72					33.74	35.18	59.98	62.52	110.09	112.99
	10.80					33.74	35.18	59.98	62.52	110.09	112.99
7/16	10.90					33.74	35.18	59.98	62.52	110.09	112.99
	11.00					33.74	35.18	59.98	62.52	102.80	105.72
	11.10					33.74	35.18			110.09	112.99
	11.11					33.74	35.18	59.98	62.52	110.09	112.99
	11.20					33.74	35.18	59.98	62.52	110.09	112.99
29/64	11.30					33.74	35.18	59.98	62.52	110.09	112.99
	11.40					33.74	35.18	59.98	62.52	110.09	112.99
	11.50					33.74	35.18	59.98	62.52	110.09	112.99
	11.51					33.74	35.18	59.98			
	11.60					33.74	35.18	59.98	62.52	110.09	112.99
15/32	11.70					33.74	35.18	59.98	62.52	110.09	112.99
	11.80					33.74	35.18	59.98	62.52	110.09	112.99
	11.90					33.74	35.18	59.98	62.52	110.09	112.99
	11.91					33.74	35.18	59.98	62.52	110.09	112.99
	12.00	12	102	55		33.74	35.18	59.98	62.52	102.80	105.72
31/64	12.10	14	107	60		45.32	46.97	83.79	87.21		
	12.20					45.32	46.97	83.79	87.21	139.97	147.26
	12.30					45.32	46.97	83.79	87.21		
	12.40					45.32	46.97	83.79	87.21		
	12.50					45.32	46.97	83.79	87.21	139.97	147.26
1/2	12.60					45.32	46.97	83.79	87.21		
	12.70					45.32	46.97	83.79	87.21	139.97	147.26
	12.80	14	107	60	45			83.79	87.21	139.97	147.26

F FIRE
 a TiAlN nanoA
 ■ tool with internal cooling

DIN 6537 short

Tool material						Carbide-UF		Carbide-UF		Carbide-UF	
Carbide grade						K/P		K/P		K/P	
Guhring no.						5514	5614	5510	5610	8510	8610
Type						RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 VA	RT 100 VA
Shank form						HA	HE	HA	HE	HA	HE
Surface finish						F	F	F	F	a	a
Drilling depth						3 x D	3 x D	3 x D	3 x D	3 x D	3 x D
Coolant ducts						—	—	■	■	■	■
Ø-range mm											
12.90 ... 20.00											
Diameter		Lengths									
nominal Ø	shank Ø	total	flute	shank							
d _{1m7}	d ₂	length	length	length							
inch	mm	l ₁	l ₂	l ₃		Unit price in £		Unit price in £		Unit price in £	
33/64	12.90	14	107	60	45			83.79	87.21		
	13.00					45.32	46.97	83.79	87.21	130.50	137.07
	13.10					45.32	46.97	83.79	87.21		
	13.20					45.32	46.97	83.79	87.21		
	13.30					45.32	46.97	83.79	87.21	139.97	147.26
	13.40							83.79	87.21		
9/16	13.50					45.32	46.97	83.79	87.21	139.97	147.26
	13.60							83.79	87.21		
	13.70					45.32	46.97	83.79	87.21	139.97	147.26
	13.80					45.32	46.97	83.79	87.21		
	13.90							83.79	87.21		
	14.00	14	107	60	45	45.32	46.97	83.79	87.21	130.50	137.07
5/8	14.10	16	115	65	48	45.32	60.75	102.31	106.50		
	14.20					45.32	60.75	102.31	106.50	172.08	179.36
	14.29					58.33	60.75	102.31	106.50	172.08	179.36
	14.30					58.33	60.75	102.31	106.50	172.08	179.36
	14.40					58.33	60.75	102.31	106.50		
	14.50					58.33	60.75	102.31	106.50	172.08	179.36
1 1/4	14.60							102.31	106.50		
	14.70					58.33	60.75	102.31	106.50	172.08	179.36
	14.80							102.31	106.50		
	14.90							102.31	106.50	172.08	
	15.00					58.33	60.75	102.31	106.50	161.83	169.14
	15.10					58.33	60.75	102.31	106.50		
1 1/2	15.20					58.33	60.75	102.31	106.50	172.08	179.36
	15.30							102.31	106.50	172.08	179.36
	15.40							102.31	106.50		
	15.50					58.33	60.75	102.31	106.50	172.08	179.36
	15.60					58.33	60.75	102.31	106.50		
	15.70					58.33	60.75	102.31	106.50	172.08	179.36
1 3/4	15.80					58.33	60.75	102.31	106.50		
	15.87					58.33	60.75	102.31	106.50		
	15.90							102.31	106.50		
	16.00	16	115	65		58.33	60.75	102.31	106.50	161.83	169.14
	16.50	18	123	73		125.80	134.37	164.39	171.00	249.36	256.63
	17.00					125.80	134.37	164.39	171.00	224.54	239.11
2	17.50					125.80	134.37	164.39	171.00	249.36	256.63
	18.00	18	123	73	48	125.80	134.37	164.39	171.00	224.54	239.11
	18.50	20	131	79	50	137.23	145.78	179.60	186.66	310.59	322.24
	19.00					137.23	145.78	179.60	186.66	294.54	306.20
	19.50					137.23	145.78	179.60	186.66	310.59	322.24
	20.00	20	131	79	50	137.23	145.78	179.60	186.66	294.54	306.20

Regrinding
and
recoating ▼



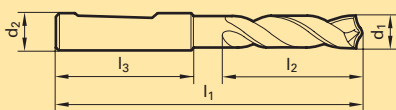
Net price
per piece

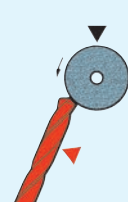
31.90

44.61

SL program Drilling Tools

Ratio drills, right-hand cutting

Tool material		Carbide-UF		Carbide-UF		Carbide-UF					
Carbide grade		K/P		K/P		K/P					
Guhring no.		5515	5615	5511	5611	8511	8611				
Type		RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 VA	RT 100 VA				
Shank form		HA	HE	HA	HE	HA	HE				
Surface finish		F	F	F	F	a	a				
Drilling depth		5 x D	5 x D	5 x D	5 x D	3 x D	3 x D				
Coolant ducts		–	–	■	■	■	■				
Ø-range mm		3.00 ... 5.56									
											
Diameter		Lengths									
nominal Ø	shank Ø	total	flute	shank							
d1m7	d2	length	length	length							
inch	mm	l1	l2	l3							
		Unit price in £		Unit price in £		Unit price in £					
1/8	3.00	6	66	28	36	23.05	24.37	32.85	33.85	61.25	62.69
	3.10					23.05	24.37	32.85	33.85	64.87	66.35
	3.17					23.05	24.37	32.85	33.85	64.87	66.35
	3.20					23.05	24.37	32.85	33.85	64.87	66.35
	3.25					23.05	24.37	32.85	33.85	64.87	66.35
	3.30					23.05	24.37	32.85	33.85	64.87	66.35
9/64	3.40					23.05	24.37	32.85	33.85	64.87	66.35
	3.50					23.05	24.37	32.85	33.85	64.87	66.35
	3.57					23.05	24.37	32.85	33.85	64.87	66.35
	3.60					23.05	24.37	32.85	33.85	64.87	66.35
	3.70		66	28		23.05	24.37	32.85	33.85	64.87	66.35
	3.80		74	36		23.05	24.37	32.85	33.85	64.87	66.35
5/32	3.90					23.05	24.37	32.85	33.85	64.87	66.35
	3.97					23.05	24.37	32.85	33.85	64.87	66.35
11/64	4.00					23.05	24.37	35.28	37.04	66.35	68.53
	4.10					23.05	24.37	35.28	37.04	70.00	72.16
	4.20					23.05	24.37	35.28	37.04	70.00	72.16
	4.30					23.05	24.37	35.28	37.04	70.00	72.16
	4.37					23.05	24.37	35.28	37.04	70.00	72.16
	4.40					23.05	24.37	35.28	37.04	70.00	72.16
3/16	4.50					23.05	24.37	35.28	37.04	70.00	72.16
	4.60					23.05	24.37	35.28	37.04	70.00	72.16
	4.65					23.05	24.37	35.28	37.04	70.00	72.16
	4.70		74	36		23.05	24.37	35.28	37.04	70.00	72.16
	4.76		82	44		23.05	24.37	35.28	37.04	70.00	72.16
	4.80					23.05	24.37	35.28	37.04	70.00	72.16
13/64	4.90					23.05	24.37	35.28	37.04	70.00	72.16
	5.00					23.05	24.37	35.28	37.04	66.35	68.53
	5.10					23.05	24.37	35.28	37.04	70.00	72.16
	5.16					23.05	24.37	35.28	37.04	70.00	72.16
	5.20					23.05	24.37	35.28	37.04	70.00	72.16
	5.30					23.05	24.37	35.28	37.04	70.00	72.16
7/32	5.40					23.05	24.37	35.28	37.04	70.00	72.16
	5.50					23.05	24.37	35.28	37.04	70.00	72.16
	5.55					23.05	24.37	35.28	37.04	70.00	72.16
	5.56	6	82	44	36	23.05	24.37	35.28	37.04	70.00	72.16



Regrinding and recoating

Net price per piece

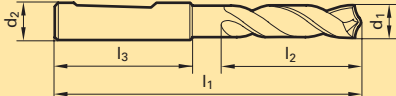
15.24

F FIRE
 a TiAlN nanoA
 ■ tool with internal cooling

DIN 6537 long

		Tool material		Carbide-UF		Carbide-UF		Carbide-UF		Regrinding and recoating 		
		Carbide grade		K/P		K/P		K/P				
		Guhring no.		5515	5615	5511	5611	8511	8611			
		Type		RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 VA	RT 100 VA			
		Shank form		HA	HE	HA	HE	HA	HE			
		Surface finish		F	F	F	F	a	a			
		Drilling depth		5 x D	5 x D	5 x D	5 x D	3 x D	3 x D			
		Coolant ducts		–	–							
Ø-range mm												
5.60 ... 8.40												
Diameter		Lengths										
nominal Ø	shank Ø	total	flute	shank								
d _{1m7}	d ₂	length	length	length								
inch	mm	l ₁	l ₂	l ₃	Unit price in £		Unit price in £		Unit price in £		Net price per piece	
15/64	5.60	6	82	44	36	23.05	24.37	35.28	37.04	70.00	72.16	15.24
	5.70					23.05	24.37	35.28	37.04	70.00	72.16	
	5.80					23.05	24.37	35.28	37.04	70.00	72.16	
	5.90					23.05	24.37	35.28	37.04	70.00	72.16	
	5.95					23.05	24.37	35.28	37.04	70.00	72.16	
	6.00	6	82	44		23.05	24.37	35.28	37.04	66.35	68.53	
1/4	6.10	8	91	53		23.37	25.14	39.03	40.79	83.12	85.29	19.20
	6.20					23.37	25.14	39.03	40.79	83.12	85.29	
	6.30					23.37	25.14	39.03	40.79	83.12	85.29	
	6.35					23.37	25.14	39.03	40.79	83.12	85.29	
	6.40					23.37	25.14	39.03	40.79	83.12	85.29	
	6.50					23.37	25.14	39.03	40.79	83.12	85.29	
17/64	6.60					23.37	25.14	39.03	40.79	83.12	85.29	
	6.70					23.37	25.14	39.03	40.79	83.12	85.29	
	6.75					23.37	25.14	39.03	40.79	83.12	85.29	
	6.80					23.37	25.14	39.03	40.79	83.12	85.29	
	6.90					23.37	25.14	39.03	40.79	83.12	85.29	
	7.00					23.37	25.14	39.03	40.79	77.28	79.46	
9/32	7.10					23.37	25.14	39.03	40.79	83.12	85.29	
	7.14					23.37	25.14	39.03	40.79	83.12	85.29	
	7.20					23.37	25.14	39.03	40.79	83.12	85.29	
	7.30					23.37	25.14	39.03	40.79	83.12	85.29	
	7.40					23.37	25.14	39.03	40.79	83.12	85.29	
	7.50					23.37	25.14	39.03	40.79	83.12	85.29	
19/64	7.54					23.37	25.14	39.03	40.79	83.12	85.29	
	7.60					23.37	25.14	39.03	40.79	83.12	85.29	
	7.70					23.37	25.14	39.03	40.79	83.12	85.29	
	7.80					23.37	25.14	39.03	40.79	83.12	85.29	
	7.90					23.37	25.14	39.03	40.79	83.12	85.29	
	7.94					23.37	25.14	39.03	40.79	83.12	85.29	
5/16	8.00	8	91	53	36	23.37	25.14	39.03	40.79	77.28	79.46	
	8.10	10	103	61	40	25.91	27.90	44.76	46.86	96.96	99.14	
	8.20					25.91	27.90	44.76	46.86	96.96	99.14	
	8.30					25.91	27.90	44.76	46.86	96.96	99.14	
	8.33					25.91	27.90	44.76	46.86	96.96	99.14	
	8.40	10	103	61	40	25.91	27.90	44.76	46.86	96.96	99.14	

Ratio drills, right-hand cutting

Tool material		Carbide-UF		Carbide-UF		Carbide-UF					
Carbide grade		K/P		K/P		K/P					
Guhring no.		5515	5615	5511	5611	8511	8611				
Type		RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 VA	RT 100 VA				
Shank form		HA	HE	HA	HE	HA	HE				
Surface finish		F	F	F	F	a	a				
Drilling depth		5 x D	5 x D	5 x D	5 x D	3 x D	3 x D				
Coolant ducts		–	–								
Ø-range mm		8.50 ... 11.20									
											
Diameter		Lengths									
nominal Ø	shank Ø	total	flute	shank							
d1m7	d2	length	length	length							
inch	mm	l1	l2	l3							
		Unit price in £		Unit price in £		Unit price in £					
11/32	8.50	10	103	61	40	25.91	27.90	44.76	46.86	96.96	99.14
	8.60					25.91	27.90	44.76	46.86	96.96	99.14
	8.70					25.91	27.90	44.76	46.86	96.96	99.14
	8.73					25.91	27.90	44.76	46.86	96.96	99.14
	8.80					25.91	27.90	44.76	46.86	96.96	99.14
	8.90					25.91	27.90	44.76	46.86	96.96	99.14
23/64	9.00					25.91	27.90	44.76	46.86	88.95	91.13
	9.10					25.91	27.90	44.76	46.86	96.96	99.14
	9.13					25.91	27.90	44.76	46.86	96.96	99.14
	9.20					25.91	27.90	44.76	46.86	96.96	99.14
	9.25					25.91	27.90	44.76	46.86	96.96	99.14
	9.30					25.91	27.90	44.76	46.86	96.96	99.14
3/8	9.40		89	47		25.91	27.90	44.76	46.86	96.96	99.14
	9.50		103	61		25.91	27.90	44.76	46.86	96.96	99.14
	9.52					25.91	27.90	44.76	46.86	96.96	99.14
	9.60					25.91	27.90	44.76	46.86	96.96	99.14
	9.70					25.91	27.90	44.76	46.86	96.96	99.14
	9.80					25.91	27.90	44.76	46.86	96.96	99.14
25/64	9.90					25.91	27.90	44.76	46.86	96.96	99.14
	9.92					25.91	27.90	44.76	46.86	96.96	99.14
	10.00	10	103	61	40	25.91	27.90	44.76	46.86	88.95	91.13
13/32	10.10	12	118	71	45	38.70	41.13	65.38	67.81	132.69	135.61
	10.20					38.70	41.13	65.38	67.81	132.69	135.61
	10.30					38.70	41.13	65.38	67.81	132.69	135.61
	10.32					38.70	41.13	65.38	67.81	132.69	135.61
	10.40					38.70	41.13	65.38	67.81	132.69	135.61
	10.50					38.70	41.13	65.38	67.81	132.69	135.61
27/64	10.60					38.70	41.13	65.38	67.81	132.69	135.61
	10.70					38.70	41.13	65.38	67.81	132.69	135.61
	10.72					38.70	41.13	65.38	67.81	132.69	135.61
	10.80					38.70	41.13	65.38	67.81	132.69	135.61
	10.90					38.70	41.13	65.38	67.81	132.69	135.61
	11.00					38.70	41.13	65.38	67.81	123.22	126.84
7/16	11.10					38.70	41.13	65.38	67.81	132.69	135.61
	11.11					38.70	41.13	65.38	67.81	132.69	135.61
	11.20	12	118	71	45	38.70	41.13	65.38	67.81	132.69	135.61

Regrinding and recoating

Net price per piece

19.20

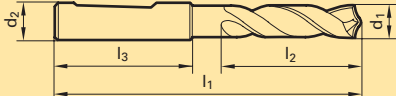
31.90

F FIRE a TiAlN nanoA tool with internal cooling

DIN 6537 long

		Tool material		Carbide grade		Guhring no.		Type		Shank form		Surface finish		Drilling depth		Coolant ducts			
		Carbide-UF		Carbide-UF		Carbide-UF													
		K/P		K/P		K/P													
		5515 5615		5511 5611		8511 8611													
		RT 100 U RT 100 U		RT 100 U RT 100 U		RT 100 VA RT 100 VA													
		HA HE		HA HE		HA HE													
		F F		F F		a a													
		5 x D 5 x D		5 x D 5 x D		3 x D 3 x D													
		- -		■ ■		■ ■													
		Ø-range mm																	
		11.30 ... 14.70																	

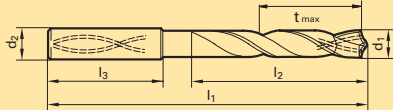
Ratio drills, right-hand cutting DIN 6537 long

Tool material		Carbide-UF		Carbide-UF		Carbide-UF	
Carbide grade		K/P		K/P		K/P	
Guhring no.		5515	5615	5511	5611	8511	8611
Type		RT 100 U	RT 100 U	RT 100 U	RT 100 U	RT 100 VA	RT 100 VA
Shank form		HA	HE	HA	HE	HA	HE
Surface finish		F	F	F	F	a	a
Drilling depth		5 x D	5 x D	5 x D	5 x D	3 x D	3 x D
Coolant ducts		–	–	■	■	■	■
Ø-range mm		14.90 ... 20.00					
							
Diameter		Lengths					
nominal Ø	shank Ø	total	flute	shank			
d1m7	d2	length	length	length			
inch	mm	l1	l2	l3			
		Unit price in £		Unit price in £		Unit price in £	
14.90	16	133	83	48	108.49	113.01	
15.00					66.27	70.78	193.93
15.10					66.27	70.78	193.93
15.20					66.27	70.78	207.06
15.30					66.27	70.78	207.06
15.40					66.27	70.78	207.06
15.50					66.27	70.78	207.06
15.60					66.27	70.78	207.06
15.70					66.27	70.78	207.06
15.80					66.27	70.78	207.06
15.87					66.27	70.78	207.06
15.90					66.27	70.78	207.06
16.00	16	133	83		108.49	113.01	193.93
16.50	18	143	93		173.87	180.81	300.38
16.67					173.87	180.81	300.38
17.00					173.87	180.81	277.04
17.50					173.87	180.81	300.38
18.00	18	143	93	48	173.87	180.81	277.04
18.50	20	153	101	50	189.08	196.47	379.12
19.00					189.08	196.47	351.42
19.50					189.08	196.47	379.12
20.00	20	151	101	50	189.08	196.47	351.42

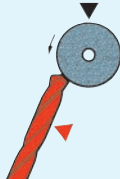
F FIRE a TiAlN nanoA tool with internal cooling

Ratio drills, right-hand cutting

Guhring std.

Tool material	Carbide-UF						
Carbide grade	K/P						
Guhring no.	5512	5612					
Type	RT 100 U	RT 100 U					
Shank form	HA	HE					
Surface finish	F	F					
Drilling depth	7 x D	7 x D					
Coolant ducts							
Ø-range mm 4.00 ... 9.52							
							
Diameter nominal Ø d1m7 inch mm		shank Ø d2 mm					
Lengths total length l1		flute length l2 shank length l3					
Unit price in £							
11/64	4.00	6	75	37.5	36	80,92	84.67
	4.20		75	37.5		80,92	84.67
	4.37		85	45		80,92	84.67
3/16	4.50					80,92	84.67
	4.60					80,92	84.67
	4.65		85	45		80,92	84.67
	4.76		90	50		80,92	84.67
	4.80					80,92	84.67
13/64	5.00					80,92	84.67
	5.10					80,92	84.67
	5.16					80,92	
	5.30		90	50		80,92	
7/32	5.50		97	57		80,92	84.67
	5.56					80,92	
	5.70					80,92	
15/64	5.80					80,92	
	5.95					80,92	
	6.00	6	97	57		80,92	84.67
1/4	6.35	8	106	66		97.90	102.31
	6.50					97.90	102.31
	6.60					97.90	102.31
	6.70					97.90	
19/64	6.80		106	66		97.90	102.31
	6.90		116	76		97.90	102.31
	7.00					97.90	102.31
	7.40					97.90	
	7.50					97.90	102.31
5/16	7.54					97.90	
	7.60					97.90	
	7.70					97.90	
	7.80					97.90	102.31
21/64	7.94					97.90	
	8.00	8	116	76	36	97.90	102.31
	8.20	10	131	87	40	119.07	
11/32	8.33					119.07	
	8.50					119.07	124.80
	8.60					119.07	124.80
23/64	8.73					119.07	
	9.00		131	87		119.07	124.80
	9.13		139	95		119.07	
	9.20					119.07	
	9.50	10	139	95	40	119.07	124.80

Regrinding and recoating



Net price per piece

15.24

19.20

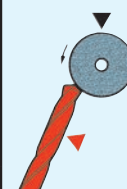
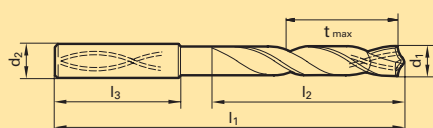
Ratio drills, right-hand cutting

F FIRE with coolant ducts

Tool material	Carbide-UF
Carbide grade	K/P
Guhring no.	5525
Type	RT 100
Shank form	HA
Surface finish	F
Drilling depth	12 x D
Coolant ducts	

Regrinding
and
recoating ▼

Ø-range mm
3.00 ... 6.35



Diameter			Lengths			
nominal Ø d _{1m7}		shank Ø d ₂	total length l ₁	flute length l ₂	shank length l ₃	
inch	mm	mm				
	3.00	6	90	50	36	102.31
	3.17					102.31
	3.17					102.31
	3.20					102.31
	3.30					102.31
	3.40					102.31
	3.50					102.31
	3.60					102.31
	3.70		90	50		102.31
	3.80		102	64		102.31
	3.90					102.31
	4.00					102.31
	4.10					102.31
	4.20					102.31
	4.30					102.31
	4.40					102.31
	4.50					102.31
	4.60					102.31
	4.70		102	64		102.31
	4.80		116	78		102.31
	4.90					102.31
	5.00					102.31
	5.10					102.31
	5.20					102.31
	5.30					102.31
	5.40					102.31
	5.50					102.31
	5.60					102.31
	5.70					102.31
	5.80					102.31
	5.90					102.31
	6.00	6	116	78		102.31
	6.10	8	146	78		120.07
1/4	6.20					120.07
	6.30					120.07
	6.35	8	146	108		120.07

Net price
per piece

16.61

20.35

Ratio drills, right-hand cutting

Tool material

Carbide grade

Guhring no.

Type

Shank form

Surface finish

Drilling depth

Coolant ducts

Carbide-UF

K/P

5525

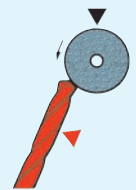
RT 100

HA

F

12 x D


 Regrinding ▼
 and recoating ▼

 Ø-range mm
6.40 ... 9.80

 Net price
 per piece

20.35

Ø-range mm 6.40 ... 9.80						
Diameter			Lengths			
nominal Ø d _{1m7}		shank Ø d ₂	total length l ₁	flute length l ₂	shank length l ₃	
inch	mm	mm				
	6.40	8	146	108	36	120.07
	6.50					120.07
	6.60					120.07
	6.70					120.07
	6.80					120.07
	6.90					120.07
	7.00					120.07
	7.10					120.07
	7.20					120.07
	7.30					120.07
	7.40					120.07
	7.50					120.07
	7.60					120.07
	7.70					120.07
	7.80					120.07
	7.90					120.07
	8.00	8	146	108	36	120.07
	8.10	10	162	120	40	152.04
	8.20					152.04
	8.30					152.04
	8.40					152.04
	8.50					152.04
	8.60					152.04
	8.70					152.04
	8.80					152.04
	8.90					152.04
	9.00					152.04
	9.10					152.04
	9.20					152.04
	9.30					152.04
	9.40					152.04
3/8	9.50					152.04
	9.52					152.04
	9.60					152.04
	9.70					152.04
	9.80	10	162	120	40	152.04

○ bright

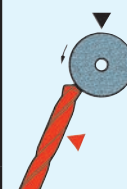
● F FIRE

■ with coolant ducts

Tool material	Carbide-UF
Carbide grade	K/P
Guhring no.	5525
Type	RT 100
Shank form	HA
Surface finish	F
Drilling depth	12 x D
Coolant ducts	

Regrinding ▼
and
recoating ▼

Ø-range mm
9.90 ... 20.00



Diameter			Lengths			Unit price in £	Net price per piece
nominal Ø d _{1m7}	shank Ø d ₂		total length l ₁	flute length l ₂	shank length l ₃		
inch	mm	mm					
	9.90	10	162	120	40	152.04	20.35
	10.00	10	162	120	40	152.04	
	10.20	12	204	156	45	199.01	
	10.50					199.01	
	11.00					199.01	
	11.50					199.01	33.17
	12.00	12	204	156		199.01	
	12.50	14	230	182		247.74	
1/2	12.70					247.74	
	13.00					247.74	
	13.50					247.74	
	14.00	14	230	182	45	247.74	
	14.50	16	260	208	48	351.37	
	15.00					351.37	
	15.50					351.37	
	16.00	16	260	208	48	351.37	46,40
	16.50	18	285	234		391.39	
	17.00					391.39	
	17.50					391.39	
	18.00	18	285	234	48	391.39	
	18.50	20	310	258	50	557.98	
	19.00					557.98	
3/4	19.05					557.98	
	19.50					557.98	
	20.00	20	310	258	50	557.98	

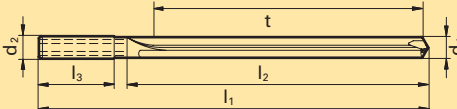
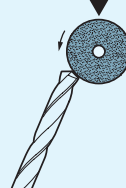
SL program DrillingTools

Ratio drills, right-hand cutting

Guhring std.

Tool material	Carbide-UF
Carbide grade	K
Guhring no.	5513
Type	RT 150 GG
Shank form	HA
Surface finish	
Drilling depth	10 x D
Coolant ducts	

Regrinding ▼

Ø-range mm 3.00 ... 11.50								
Diameter			Lengths					
inch	nominal Ø d1m7 mm	shank Ø d2 mm	total length l1	flute length l2	shank length l3			
1/8	3.00	6	91	42	36		34.07	
	3.17						34.07	
	3.25						34.07	
9/64	3.30			42			34.07	
	3.50			48			34.07	
	3.57		91	48			34.07	
5/32	3.80		121	77			34.07	
	3.97						34.07	
	4.00						42.34	
	4.20						42.34	
	4.50			77			42.34	
	5.00			82			42.34	
	5.50						42.34	
	6.00	6	121	82			42.34	
1/4	6.35	8	146	106			55.35	
	6.50						55.35	
	6.80						55.35	
	7.00						55.35	
	7.50						55.35	
	7.80						55.35	
	8.00	8	146	106	36		55.35	
	8.50	10	175	130	40		69.57	
	9.00						69.57	
	9.50						69.57	
	3/8	9.52					69.57	
	10.00	10	175	130	40		69.57	
	10.20	12	209	159	45		86.33	
	10.50						86.33	
	11.00						86.33	
	11.50	12	209	159	45		86.33	
	12.00	12	209	159	45		86.33	
	12.50	14	233	183			114.88	
	12.70						114.88	
	13.00						114.88	
	13.50						114.88	
	14.00	14	233	183	45		114.88	
	14.50	16	260	207	48		145.43	
	15.00						145.43	
	15.50						145.43	
	16.00	16	260	207	48		145.43	

○ bright ■ with coolant ducts

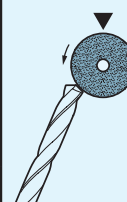
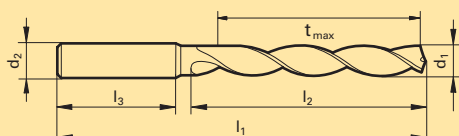
3-fluted Ratio drills, right-hand cutting

DIN 6537 long

Tool material	Carbide-UF
Carbide grade	K
Guhring no.	5518
Type	FT200
Shank form	HA
Surface finish	○
Drilling depth	5 x D
Coolant ducts	–

Regrinding ▼

Ø-range mm
3.00 ... 8.60



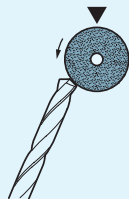
Net price
per piece

Diameter		Lengths			Unit price in £
nominal Ø d1m7 mm	shank Ø d2 mm	total length l1	flute length l2	shank length l3	
3.00	6	66	28	36	27.34
3.10					27.34
3.20					27.34
3.30					27.34
3.50					27.34
3.70		66	28		27.34
3.80		74	36		27.34
4.00					27.34
4.10					27.34
4.20					27.34
4.50		74	36		27.34
4.80		82	44		27.34
5.00					27.34
5.10					27.34
5.20					27.34
5.30					27.34
5.50					27.34
5.80					27.34
6.00	6	82	44		27.34
6.10	8	91	53		32.85
6.20					32.85
6.40					32.85
6.50					32.85
6.70					32.85
6.80					32.85
7.00					32.85
7.10					32.85
7.40					32.85
7.50					32.85
7.80					32.85
8.00	8	91	53	36	32.85
8.10	10	103	61	40	37.60
8.20					37.60
8.40					37.60
8.50					37.60
8.60	10	103	61	40	37.60

12.71

15.24

3-fluted Ratio drills, right-hand cutting DIN 6537 long

Tool material					Carbide-UF		Regrinding ▼ 
Carbide grade					K		
Guhring no.					5518		
Type					FT200		
Shank form					HA		
Surface finish							
Drilling depth					5 x D		
Coolant ducts					–		
Ø-range mm							
8.70 ... 20.00							
Diameter		Lengths					
nominal Ø d _{1m7} mm	shank Ø d ₂ mm	total length l ₁	flute length l ₂	shank length l ₃			
8.70	10	103	61	40	37.60		
8.80					37.60		
9.00					37.60		
9.10					37.60		
9.50					37.60		
9.80					37.60		
10.00	10	103	61	40	37.60		
10.10	12	118	71	45	55.24		
10.20					55.24		
10.30					55.24		
10.50					55.24		
11.00					55.24		
11.20					55.24		
11.50					55.24		
11.80					55.24		
12.00	12	118	71		55.24		
12.10	14	124	77		72.44		
12.50					72.44		
13.00					72.44		
13.50					72.44		
14.00	14	124	77	45	72.44		
14.50	16	133	83	48	89.42		
15.00					89.42		
15.50	16	133	83		89.42		
16.00	16	133	83		89.42		
16.50	18	143	93		138.59		
17.00					138.59		
17.50					138.59		
18.00	18	143	93	48	138.59		
18.50	20	153	101	50	187.20		
19.00					187.20		
19.50					187.20		
20.00	20	153	101	50	187.20		

Net price per piece
15.24
20.35
30.60

○ bright

Stub drills, right-hand cutting

DIN 6539

Tool material				Tool material			
Carbide-UF				Carbide-UF			
K				K			
5516				5516			
N				N			
Surface finish				Surface finish			
Ø-range mm				Ø-range mm			
2.00 ... 5.20				5.50 ... 12.00			
Diameter		Lengths		Diameter		Lengths	
inch	mm	total length	flute length	inch	mm	total length	flute length
							
Unit price in £				Unit price in £			
	1.50	32	9		5.50	66	28
	1.60	34	10		5.80	66	28
	2.00	38	12		6.00	66	28
	2.10	38	12	1/4	6.35	70	31
	2.20	40	13		6.40		
	2.30	40	13		6.50	70	31
3/32	2.38	43	14		6.80	74	34
	2.40				6.90		
	2.50				7.00		
	2.60	43	14	9/32	7.14		
	2.70	46	16		7.50	74	34
7/64	2.78			5/16	7.94	79	37
	2.80				8.00		
	2.90				8.50	79	37
	3.00	46	16		8.60	84	40
	3.10	49	18	11/32	8.73		
1/8	3.17				8.80		
	3.20				9.00		
	3.30	49	18		9.50	84	40
	3.40	52	20		10.00	89	43
	3.50				10.20		
9/64	3.57				10.50	89	43
	3.60				11.00	95	47
	3.70	52	20	7/16	11.11		
	3.80	55	22		11.50	95	47
	3.90			15/32	11.91	102	51
5/32	3.97				12.00	102	51
	4.00						
	4.10						
	4.20	55	22				
	4.30	58	24				
11/64	4.37						
	4.40						
	4.50						
	4.60						
	4.70	58	24				
3/16	4.76	62	26				
	4.80						
	4.90						
	5.00						
	5.10						
	5.20	62	26				

SL program Drilling Tools

Jobber drills, right-hand cutting Guhring std.

Tool material		Carbide-UF		Tool material		Carbide-UF	
Carbide grade		K		Carbide grade		K	
Guhring no.		5517		Guhring no.		5517	
Type		N		Type		N	
Surface finish				Surface finish			
Ø-range mm				Ø-range mm			
2.00 ... 5.56				5.95 ... 12.00			
Diameter		Lengths		Diameter		Lengths	
inch	mm	total length	flute length	inch	mm	total length	flute length
		Unit price in £				Unit price in £	
3/32	2.00	49	24	15/64	5.95	93	57
	2.10	49	24		6.00	93	57
	2.20	53	27	1/4	6.35	101	63
	2.30	53	27		6.50	101	63
	2.38	57	30		6.80	109	69
	2.40				6.90		
7/64	2.50			9/32	7.00		
	2.60	57	30		7.14		
	2.70	61	33		7.50	109	69
	2.78			5/16	7.94	117	75
1/8	2.80				8.00		
	2.90				8.50	117	75
	3.00	61	33	11/32	8.73	125	81
	3.10	65	36		9.00		
9/64	3.17				9.50	125	81
	3.20			7/16	10.00	133	87
	3.30	65	36		10.20		
	3.40	70	39		10.50	133	87
5/32	3.50			15/32	11.00	142	94
	3.57				11.11		
	3.60				11.50	142	94
	3.70	70	39		11.91	151	101
11/64	3.80	75	43		12.00	151	101
	3.90						
	3.97						
	4.00						
3/16	4.10						
	4.20	75	43				
	4.30	80	47				
	4.37						
7/32	4.40						
	4.50						
	4.60						
	4.70	80	47				
	4.76	86	52				
	4.80						
	4.90						
	5.00						
13/64	5.10						
	5.16	86	52				
	5.50	93	57				
	5.56	93	57				

bright TiN

Stub drills, right-hand cutting

DIN 1897

				HSCO		PM HSS-E
Tool material				5524	5520	5521
Guhring no.				GU 500 DZ	GU 500 DZ	GT 500 DZ
Type				○	Ⓢ	Ⓢ
Surface finish						
Ø-range mm						
1.00 ... 4.50						
Diameter		Lengths				
inch	mm	total length	flute length			
				Unit price in £		Unit price in £
	1.00	26	6	1,32	3,31	6,39
	1.10	28	7	1,32	3,31	6,39
	1.20	30	8	1,32	3,53	6,51
	1.30	30	8	1,32	3,75	6,84
	1.40	32	9	1,32	3,31	6,39
	1.50	32	9	1,32	3,20	6,07
	1.60	34	10	1,32	3,31	6,17
	1.70	34	10	1,32	3,31	6,17
	1.80	36	11	1,32	3,31	6,17
	1.90	36	11	1,32	3,31	6,17
	2.00	38	12	1,32	2,76	5,29
	2.10	38	12	1,32	3,31	5,85
	2.20	40	13	1,32	3,31	6,39
	2.30	40	13	1,32	2,87	6,39
3/32	2.38	43	14	1,32	3,20	6,39
	2.40			1,32	3,53	6,62
	2.50			1,32	2,98	5,63
	2.60	43	14	1,32	3,64	6,62
7/64	2.70	46	16	1,44	3,75	6,29
	2.78			1,44	3,64	5,29
	2.80			1,44	3,53	6,84
	2.90			1,44	3,75	6,07
	3.00	46	16	1,32	3,20	5,85
	3.10	49	18	1,44	3,31	6,07
1/8	3.17			1,44	3,31	6,07
	3.20			1,44	3,20	6,51
	3.30	49	18	1,44	3,20	6,62
	3.40	52	20	1,54	3,75	5,95
	3.50			1,54	3,20	6,39
9/64	3.57			1,54	3,64	6,07
	3.60			1,54	3,97	5,29
	3.70	52	20	1,54	3,64	5,63
	3.80	55	22	1,66	3,86	6,39
	3.90			1,66	4,41	7,17
5/32	3.97			1,66	3,97	6,39
	4.00			1,66	3,64	5,95
	4.10			1,66	4,08	6,84
	4.20	55	22	1,66	3,64	6,07
	4.30	58	24	1,66	4,08	6,73
11/64	4.37			1,66	4,31	6,95
	4.40			1,66	4,41	7,17
	4.50	58	24	1,66	4,08	6,07

SL program Drilling Tools

Stub drills, right-hand cutting

				HSCO		PM HSS-E	
Tool material				5524	5520	5521	
Guhring no.				GU 500 DZ	GU 500 DZ	GT 500 DZ	
Type							
Surface finish							
Ø-range mm							
4.60 ... 8.00							
Diameter		Lengths					
inch	mm	total length	flute length				
				Unit price in £		Unit price in £	
3/16	4.60	58	24	1,66	4,08	7,61	
	4.70	58	24	1,66	4,41	7,17	
	4.76	62	26	1,66	4,53	7,17	
	4.80			1,66	4,63	7,72	
	4.90			1,66	4,63	7,83	
	5.00			1,66	3,97	6,62	
13/64	5.10			1,76	4,31	6,84	
	5.16			1,76	4,53	7,06	
	5.20			1,76	4,63	7,94	
	5.30	62	26	1,76	4,85	7,61	
	5.40	66	28	1,98	5,19	8,27	
	5.50			1,88	4,41	7,06	
7/32	5.56			2,10	4,85	8,49	
	5.60			2,10	5,29	8,49	
	5.70			2,10	5,63	8,94	
	5.80			2,10	5,41	9,16	
	5.90			2,10	5,63	8,94	
	5.95			2,10	5,29	8,60	
15/64	6.00	66	28	1,98	4,75	7,50	
	6.10	70	31	2,32	5,63	8,82	
	6.20			2,32	5,63	8,82	
1/4	6.30			2,32	5,95	9,26	
	6.35			2,32	5,95	9,16	
	6.40			2,32	5,95	9,16	
	6.50			2,21	5,63	7,72	
	6.60			2,43	6,17	9,70	
	6.70	70	31	2,43	6,39	10,04	
	6.80	74	34	2,87	6,84	9,04	
	6.90			2,87	6,73	10,70	
	7.00			2,87	6,29	11,80	
9/32	7.10			3,53	7,61	13,01	
	7.14			3,53	7,72	12,46	
	7.20			3,53	7,72	12,90	
	7.30			3,53	7,72	12,90	
	7.40			3,53	7,83	13,01	
	7.50	74	34	2,98	6,51	12,35	
	7.60	79	37	3,86	8,38	13,79	
	7.70			3,86	8,38	13,79	
	7.80			3,86	8,38	11,80	
5/16	7.90			3,86	8,38	13,79	
	7.94			3,86	7,94	14,89	
	8.00	79	37	3,20	7,72	12,90	

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DIN 1897

				HSCO		PM HSS-E
Tool material				5524	5520	5521
Guhring no.				GU 500 DZ	GU 500 DZ	GT 500 DZ
Type						
Surface finish				○	Ⓢ	Ⓢ
Ø-range mm						
8.10 ... 14.00						
Diameter		Lengths				
inch	mm	total length	flute length			
				Unit price in £		Unit price in £
	8.10	79	37	3.86	9.92	16.32
	8.20			3.86	10.26	16.87
	8.30			3.86	10.48	17.20
	8.40			3.86	10.48	17.20
	8.50	79	37	3.31	9.04	14.33
	8.60	84	40	5.85	11.36	
11/32	8.73			4.53	10.14	15.66
	8.80			4.53	11.36	20.18
	9.00			3.86	9.16	15.77
	9.30			4.85	10.48	23.59
	9.50	84	40	4.31	10.14	18.96
	9.80	89	43	5.41	12.02	20.40
	10.00			4.85	9.92	18.20
	10.20			6.29	12.57	26.80
	10.40			8.14	12.57	
	10.50	89	43	6.29	11.91	25.91
	10.80	95	47		13.23	
	11.00			7.28	13.35	25.91
7/16	11.11			8.38	14.23	30.54
	11.50	95	47	8.38	15.33	27.34
	12.00	102	51	8.72	14.89	31.43
	12.50			10.70	16.43	34.29
	12.70				17.20	
	13.00	102	51	12.57	16.43	34.29
	13.50	107	54	13.01	17.54	36.50
	14.00	107	54	13.57	21.72	45.32

SL program Drilling Tools

Jobber drills, right-hand cutting

				HSCO		PM HSS-E
Tool material				5523	5519	5522
Guhring no.				GU 500 DZ	GU 500 DZ	GT 500 DZ
Type						
Surface finish						
Ø-range mm						
1.00 ... 4.37						
Diameter		Lengths				
inch	mm	total length	flute length			
	1.00	34	12	1,32	2,76	7,06
	1.10	36	14	1,32	2,98	6,95
	1.20	38	16	1,32	2,87	7,17
	1.30	38	16	1,32	2,98	7,61
	1.40	40	18	1,32	2,98	6,95
	1.45	40	18		2,98	
	1.50	40	18	1,32	2,76	6,73
	1.60	43	20	1,32	2,76	6,84
	1.70	43	20	1,32	2,98	6,84
	1.80	46	22	1,32	2,98	6,84
	1.90	46	22	1,32	2,98	6,84
	2.00	49	24	1,32	2,87	5,85
	2.10	49	24	1,32	2,98	6,39
	2.20	53	27	1,32	3,20	6,95
	2.30			1,32	3,09	6,95
3/32	2.38	53	27	1,32	3,09	7,06
	2.40	57	30	1,32	2,87	7,17
	2.50			1,32	2,98	6,29
	2.60	57	30	1,32	3,09	7,61
7/64	2.70	61	33	1,44	3,20	7,17
	2.78			1,44	3,20	6,17
	2.80			1,44	3,20	7,94
	2.90			1,44	3,20	6,95
	3.00	61	33	1,32	3,09	6,62
1/8	3.10	65	36	1,44	3,53	6,95
	3.17			1,44	3,31	6,95
	3.20			1,44	3,31	7,61
	3.30	65	36	1,44	3,53	7,61
	3.40	70	39	1,54	3,75	6,84
	3.50			1,54	3,75	7,17
9/64	3.57			1,54	3,75	6,95
	3.60			1,54	3,75	6,07
	3.70	70	39	1,54	3,75	6,51
	3.80	75	43	1,66	3,97	7,17
5/32	3.90			1,66	4,08	8,38
	3.97			1,66	3,97	7,28
	4.00			1,66	3,86	6,73
	4.10			1,66	3,97	7,83
	4.20			1,66	3,97	6,95
	4.25	75	43		4,19	
	4.30	80	47	1,66	4,19	7,72
11/64	4.37	80	47	1,66	4,19	7,94

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DIN 338

				HSCO		PM HSS-E
Tool material				5523	5519	5522
Guhring no.				GU 500 DZ	GU 500 DZ	GT 500 DZ
Type				○	Ⓢ	Ⓢ
Surface finish						
Ø-range mm						
4.40 ... 7.90						
Diameter		Lengths				
inch	mm	total length	flute length	Unit price in £		Unit price in £
	4.40	80	47	1,66	4,19	8,38
	4.50			2,10	4,08	6,84
	4.60			1,66	4,31	8,72
	4.70	80	47	1,66	4,31	8,38
	4.76	86	52	1,76	4,41	8,38
3/16	4.80			1,66	4,41	8,82
	4.90			1,76	4,53	9,04
	5.00			1,76	4,41	7,61
	5.10			1,76	4,53	8,27
	5.16			1,76	4,53	8,38
	5.20			1,76	4,53	9,48
13/64	5.30	86	52	1,76	4,85	9,16
	5.40	93	57	1,98	5,41	9,92
	5.50			1,88	5,29	8,49
7/32	5.56			2,10	5,29	10,14
	5.60			2,10	5,51	10,04
	5.70			2,10	5,51	10,70
	5.80			2,10	5,51	11,03
	5.90			2,10	5,63	10,70
	5.95			2,10	5,41	10,26
15/64	6.00	93	57	1,98	5,29	8,94
	6.10	101	63	2,32	6,07	10,70
	6.20			2,32	5,95	10,70
	6.30			2,32	5,85	11,14
	6.35			2,32	5,95	11,03
	6.40			2,32	5,95	11,03
1/4	6.50			2,32	6,39	9,26
	6.60			2,43	6,51	11,69
	6.70	101	63	2,43	6,62	12,02
	6.80	109	69	2,98	7,17	11,80
	6.90			2,98	7,17	12,79
	7.00			2,87	7,17	14,11
9/32	7.10			3,53	7,94	15,66
	7.14			3,53	7,94	14,89
	7.20			3,53	7,94	15,44
	7.30			3,53	8,38	15,44
	7.40			3,53	8,38	15,55
	7.50	109	69	2,98	7,61	14,89
	7.60	117	75	3,86	9,04	16,43
	7.70			3,86	8,82	16,54
	7.80			3,86	8,94	13,89
	7.90	117	75	3,86	9,38	16,43

SL program Drilling Tools

Jobber drills, right-hand cutting DIN 338

Tool material Guhring no. Type Surface finish				HSCO		PM HSS-E	
				5523	5519	5522	
				GU 500 DZ	GU 500 DZ	GT 500 DZ	
							
Ø-range mm 7.94 ... 14.00							
Diameter		Lengths		Unit price in £		Unit price in £	
inch	mm	total length	flute length				
5/16	7.94	117	75	3.86	8.94	17.86	
	8.00			3.20	8.60	15.44	
	8.10			3.86	9.26	20.40	
	8.20			3.86	9.16	21.28	
	8.30			3.86	9.16	21.28	
	8.40			3.86	9.60	21.28	
	8.50	117	75	3.31	8.72	18.08	
	8.60	125	81	5.85	9.48		
	8.70			4.53	12.80		
11/32	8.73			4.53	9.48	19.40	
	8.80			4.53	10.26	25.03	
	8.90			6.46	10.26		
	9.00			3.86	9.60	19.96	
	9.30			4.85	10.48	29.66	
	9.50	125	81	4.31	10.14	23.59	
	9.80	133	87	5.41	11.80	25.47	
	10.00			4.85	11.47	22.71	
	10.20			6.39	13.23	34.73	
	10.30			8.14	13.35		
	10.50	133	87	6.39	13.35	33.74	
	11.00	142	94	7.28	13.79	33.74	
7/16	11.11			8.38	14.45	39.81	
	11.50	142	94	8.38	15.33	35.62	
	12.00	151	101	8.72	16.21	40.69	
	12.50			10.70	16.76	44.44	
	12.70			11.69		60.69	
	13.00	151	101	12.57	17.98	44.44	
	13.50	160	108	14.23	20.84	47.19	
	14.00	160	108	14.89	21.72	59.21	

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SL program

GuhringNavigator Drilling Tools

Application recommendations

Tools with **bold** feed column no. are preferred choice.

General recommendations:
For safety reasons it is very important, that a drill does not exceed a speed of $n = 6,000 \text{ rev./min}$ when unsupported. The centrifugal forces can break these long tools before reaching the workpiece surface!

2.) alternatively SL drills can produce their own pilot hole. Cutting speed and feed rate should be reduced by 30-40%.

The recommended minimum coolant pressure is 40 bar.

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.

For RT 100 VA drills with nom. diameter $\leq 10 \text{ mm}$ please choose feed column no. 3, for nom. diameter $> 10 \text{ mm}$ please choose feed column no. 2.

Application recommendations for 7xD, 10xD and 12xD drills: Pilot holes are necessary for extra length SL drills $\geq 7xD$:
1.) the pilot hole can be produced with a short, rigid drill. The diameter should be 0.01 - 0.02 mm larger than the diameter of the SL drill, the drilling depth $> 1 \times D$.

Application recommendations RT 100 VA: 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.

Drill Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
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
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
50.00	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
63.00	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
80.00	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- bright
a TiAlN nanoA-coated
F FIRE-coated

- Cooling:
☒ without coolant ducts
☐ with coolant ducts
- Coolant:
☐ Air
☐ Neat oil
☐ Soluble oil
- Cutting direction:
☒ right-hand cutting

Material group	Material examples, new description (old description in brackets) <i>Figures in bold = material no. to DIN EN</i>	Tensile strength Hardness MPa (N/mm²)	Cool- ant
Common structural steels	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤ 500 >500-850	●●
Free-cutting steels	1.0718 11SMnPB30 (9SMnPB28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤ 850 850-1000	●●
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 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- $\leq$ 1000 1000-1200	●●
Unalloyed case hard. steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤ 750	●●
Alloyed case hardened steels	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850- $\leq$ 1000 1000-1200	●●
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥ 850 - $\leq$ 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 S 6-5-3	≥ 650 -1000	●●
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)	≤ 330 HB	●●
Stainless steels, sulphured austenitic martensitic	1.4305 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤ 850 ≤ 850 ≤ 850	●●●
Hardened steels	-	≤ 40 -48 HRC >48-60 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	●●●
New cast materials CGI	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6	≤ 220 HB <300 HB	●●●
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	●●●
Spheroidal graphite iron 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	●●
Chilled cast iron	-	≤ 350 HB	●●
Ti and Ti-alloys	3.7024 Ti99.5, 3.7114 TiAl5Sn2.5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 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 alloys $\leq 10\%$ Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤ 600	●●
Al cast alloys $> 10\%$ Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, -G-AlSi12CuNiMg	≤ 600	●●
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤ 450	●●
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPB	≤ 400	●●
Brass, short-chipping long-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5	≤ 600 ≤ 600	●●
Bronze, short-chipping	2.1090 CuSn7ZnPB, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤ 600 >600-850	●●
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤ 850 >850-1000	●●

Tool material			
Carbide grade			
Type			
Surface finish			
Cooling			
Gühr. no.	DIN	HA	R
	6537	HE	R
	G.S.	HA	R
		HE	R

≤3×D

Carbide

K/P

RT 100 U

F

5510

5610



v _c m/min	Feed col. no.	v _c m/min
145	7	130
120	6	110
170	8	145
145	8	110
130	8	120
125	7	110
120	7	105
120	7	105
105	7	100
145	8	130
120	7	120
85	5	85
110	7	100
105	5	90
80	6	65
65	5	55
60	3	45
60	5	55
55	5	45
45	5	45
55	3	45
35	2	25
35	4	25
195	9	210
160	9	155
140	9	155
130	8	125
40	3	35
45	4	40
40	3	35
310	9	260
310	9	260
260	9	220
220	9	180
280	8	260
125	7	105
325	8	270
220	7	180
125	7	105
105	6	85
90	6	80
80	6	60

40 | GUHRING SuperLine

SuperLine **GUHRING** 41

SL program

GuhringNavigator Drills

Application recommendations

Tools with **bold** feed column no. are preferred choice.

* Use tools with large back taper

General recommendations:

For safety reasons it is very important, that a drill does not exceed a speed of n = 6,000 rev./min when unsupported. The centrifugal forces can break these long tools before reaching the workpiece surface!

Drill Ø mm	Feed column no.								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
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
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
50.00	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
63.00	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
80.00	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- bright
- S

TiN-coated
- UF Ultra fine grain

- Coolant:
- Air
- Neat oil
- Soluble oil

* Cutting lip corrected to appr. 10°

Material group	Material examples, new description (old description in brackets) <i>Figures in bold = material no. to DIN EN</i>	Tensile strength Hardness MPa (N/mm²)	Cool- ant
Common structural steels	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850	
Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000	
Unalloyed heat-treatable steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 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 (Ck10)	≤750	
Alloyed case hardened steels	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 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 S 6-5-3	≥650-1000	
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (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 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850	
Hardened steels	–	≤40-48 HRC >48-60 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	
Spheroidal graphite iron 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	
Chilled cast iron	–	≤350 HB	
Ti and Ti-alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 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 alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600	
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600	
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450	
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnNb	≤400	
Brass, short-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600	
long-chipping	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600	
Bronze, short-chipping	2.1090 CuSn7ZnNb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850	
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000	
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	–	
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	–	
Kevlar	Kevlar	–	
Glass, carbon concent. plastics	GFK/CFK	–	

$\leq 3 \times D$ drilling depth

		HSCO		HSS-E-PM	Carbide
Tool material					
Carbide grade		–	–	–	K10/K20
Type		GU 500	GU 500	GU 500	N
Surface finish		○	Ⓢ	Ⓢ	○
Guhring no. straight	DIN 1897	5524	5520	5521	
	DIN 338				
	DIN 6539				5516
	G.S.				



○	Ⓢ						
V _c m/min	V _c m/min	Feed column no.		V _c m/min	Feed col. no.	V _c m/min	Feed col. no.
35	45	6	6	40	6		
30	35	5	5	32	5		
40	50	6	6	45	6		
30	40	6	6	40	5		
32	42	6	6	42	6		
28	35	6	6	40	5		
20	22	5	5	28	4		
15	18	4	4	25	4		
13	15	3	3	20	3		
30	40	6	6	40	4		
16	20	4	4	22	4		
12	15	3	3	18	3		
15	18	4	4	20	4		
10	12	3	3	15	3		
15	18	4	4	25	4		
10	13	3	3	15	3		
10	13	3	3	15	3		
				12	2		
14	18	4	4	15	4	25	4
10	12	4	4	10	3	25	3
12	15	4	4	12	3	25	3
						20	3
36	45	6	6	50	6	15	2
30	36	6	6	40	6	90	4
30	40	6	6	45	6	80	4
22	28	6	6	32	6	70	4
				8	3	60	4
						20	3
						15	2
50	70	7	7			200	7
50	70	7	7			200	7
65	85	7	7			150	6
60	70	6	6			120	6
60	70	6	6			180	5
25	32	5	5	50	5	80	5*
45	63	5	5			180	5*
30	40	5	5	60	5	180	5*
36	50	4	4	50	5	120	5
30	35	4	4	45	4	120	5
30	32	4	4	40	4	70	4
25	28	4	4	32	4	50	3
20	25	4	4	25	4	50	4
15	15	4	4			40	3
						80	3

$\leq 5 \times D$ drilling depth

HSCO		HSS-E-PM	Carbide
—	—	—	K10/K20
GU 500	GU 500	GT 500	N
○	Ⓢ	Ⓢ	○
5523	5519	5522	
			5517



○	●						
V _c m/min	V _c m/min	Feed column no.		V _c m/min	Feed col. no.	V _c m/min	Feed col. no.
35	45	6	6	40	6		
30	35	5	5	32	5		
40	50	6	6	45	6		
30	40	6	6	40	5		
32	42	6	6	42	6		
28	35	6	6	40	5		
20	22	5	5	28	4		
15	18	4	4	25	4		
13	15	3	3	20	3		
30	40	6	6	40	4		
16	20	4	4	22	4		
12	15	3	3	18	3		
15	18	4	4	20	4		
10	12	3	3	15	3		
15	18	4	4	25	4		
10	13	3	3	15	3		
10	13	3	3	15	3		
				12	2		
14	18	4	4	15	4	25	4
10	12	4	4	10	3	25	3
12	15	4	4	12	3	25	3
						20	3
						15	2
36	45	6	6	50	6	90	4
30	36	6	6	40	6	80	4
30	40	6	6	45	6	70	4
22	28	6	6	32	6	60	4
				8	3		
						20	3
						15	2
50	70	7	7			200	7
50	70	7	7			200	7
65	85	7	7			150	6
60	70	6	6			120	6
60	70	6	6			180	5
25	32	5	5	50	5	80	5*
45	63	5	5			180	5*
30	40	5	5	60	5	180	5*
36	50	4	4	50	5	120	5
30	35	4	4	45	4	120	5
30	32	4	4	40	4	70	4
25	28	4	4	32	4	50	3
20	25	4	4	25	4	40	4
15	15	4	4			50	3
						80	3

SL program Milling cutters

Ratio unequal helix end mills RF 100, 4-fluted

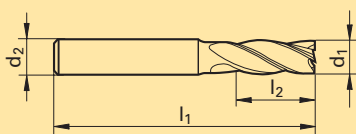
DIN 6527 short

[illegible]

F FIRE *with highly unequal helix angles

Ratio unequal helix end mills RF 100, 4-fluted

DIN 6527 long

				Tool material	Carbide-UF		Regrinding and recoating ▼	
				Carbide grade	K/P			
				Guhring no.	5735	5535		
				Form	HA	HB		
				Type	N	N		
				Tolerance on cutting diameter	h10	h10		
				Surface finish	F	F		
				Helix angle*	35° and 38°		Regrinding and recoating ▼	
Ø-range mm 4.00 ... 25.00								
								
Diameter mm nominal Ø d1 shank Ø d2		Lengths mm total length l1 cutting edge length l2		Unit price in £		Net price per piece		
4.00	6	57	11	13.86	14.91		12.71	
5.00	6	57	13	13.86	14.91		12.71	
6.00	6	57	13	14.21	14.78		19.20	
8.00	8	63	19	18.25	18.83		19.20	
10.00	10	72	22	27.15	27.72		22.88	
12.00	12	83	26	35.00	35.70		22.88	
14.00	14	83	26	46.43	47.01		24.26	
16.00	16	92	32	60.98	61.68		26.68	
18.00	18	92	32	86.28	86.98			
20.00	20	104	38	93.68	94.25			
25.00	25	121	45	196.12	201.89			

Guhring std.

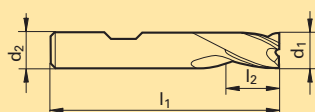
46 | **GUHRING** SuperLine

Mini slot drills, 3-fluted

Guhring std. short

Tool material	Carbide-UF
Carbide grade	K/P
Guhring no.	5573
Form	–
Type	N
Tolerance on cutting diameter	h10
Surface finish	
Helix angle	30°

Ø-range mm
0.50 ... 20.00



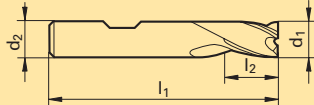
Diameter mm		Lengths mm		Unit price in £
nominal Ø d1	shank Ø d2	total length l1	cutting edge length l2	
0.50*	3	38	1.5	7.85
0.60*			1.5	7.85
0.80*			2	6.36
1.00*				5.31
1.20*				8.21
1.50*				5.31
1.80*	3	38	2	8.21
2.00	6	35	4	6.93
2.50		36	5	7.16
3.00		36	5	6.93
3.50		37	6	7.16
4.00		38	7	6.93
4.50		38	8	8.21
5.00		39		7.85
5.50				8.21
5.75				9.13
6.00	6	39	8	7.85
6.75	8	42	10	12.01
7.00				10.98
7.75		42	10	11.21
8.00	8	43	11	10.98
8.70	10	48		16.86
9.00				16.06
9.70		48	11	16.86
10.00	10	50	13	15.60
12.00	12	55	15	18.71
14.00	14	58	15	25.53
16.00	16	62	18	33.03
18.00	18	70	20	39.50
20.00	20	75	22	52.79

 FIRE

* ≤ Ø 1.8 mm: straight shank according to DIN 6535 HA

SL program Milling cutters

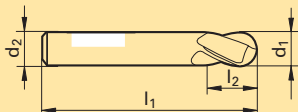
Mini slot drills, 3-fluted Guhring std. long

Tool material				Carbide-UF
Carbide grade				K/P
Guhring no.				5574
Form				–
Type				N
Tolerance on cutting diameter				h10
Surface finish				
Helix angle				45°
Ø-range mm				
1.00 ... 10.00				
				
				
Diameter mm		Lengths mm		Unit price in £
nominal Ø d1	shank Ø d2	total length l1	cutting edge length l2	
1.00*	3	38	2	6.36
1.20*			2	7.85
1.50*			3	6.36
1.80*	3	38	3	7.85
2.00	6	45	4	8.78
2.50			5	9.13
3.00			6	8.78
3.50			6	8.78
4.00			7	8.78
4.50			8	9.36
5.00				8.78
5.50			8	9.36
5.75			10	9.36
6.00	6	45		8.78
6.75	8	55	10	12.24
7.00			12	12.01
7.75			12	12.01
8.00	8		13	12.01
8.70	10		14	16.29
9.00			14	15.25
9.70			16	16.52
10.00	10	55	16	16.06

 FIRE *≤ Ø 1.8 mm: straight shank according to DIN 6535 HA

Ball nose slot drills, 2-fluted

DIN 6527 long

Tool material				Carbide-UF	
Carbide grade				K/P	
Guhring no.				5585	5533
Form				HA	HB
Type				N	N
Tolerance on cutting diameter				H10	h10
Surface finish				F	F
Helix angle				30°	30°
Ø-range mm					
0.50 ... 20.00					
					
Diameter mm		Lengths mm			
nominal Ø d1	shank Ø d2	total length l1	cutting edge length l2		
				Unit price in £	
0.50	3	38	1	21.37	
1.00	3	38	2	18.60	
1.50	3	38	3	17.56	
2.00	6	57	6	17.91	
3.00	6	57	7	17.91	
4.00	6	57	8	17.91 18.48	
5.00	6	57	10	17.91 18.48	
6.00	6	57	10	17.91 18.48	
8.00	8	63	16	22.87 23.45	
10.00	10	72	19	29.69 30.26	
12.00	12	83	22	41.47 42.04	
20.00	20	104	32	104.87	

DIN 6527 long

F FIRE

SL program Milling cutters

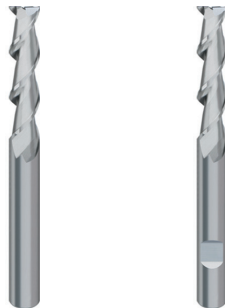
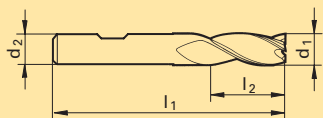
Slot drills, 2-fluted

DIN 6527 long

Tool material	Carbide-UF	
Carbide grade	K	
Guhring no.	5743	5543
Form	HA	HB
Type	W*	W*
Cutting diameter	e8	e8
Surface finish		
Helix angle	45°	

Regrinding ▼

Ø-range mm
3.00 ... 20.00

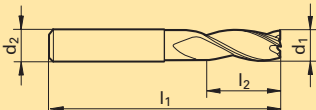
[illegible]Net price
per piece

7.65
9.03
12.71
12.71
14.00
15.30
16.64

○ bright *especially for aluminium and non-ferrous metals

Slot drills, 3-fluted

DIN 6527 short

Tool material				Carbide-UF		Regrinding and recoating
Carbide grade				K/P		
Guhring no.				5505	5502	
Form				HA	HB	
Type				NH	NH	
Tolerance on cutting diameter				h10	h10	
Surface finish				F	F	Regrinding and recoating
Helix angle				45°		
Ø-range mm						Regrinding and recoating
3.00 ... 20.00						
						Regrinding and recoating
Diameter mm		Lengths mm				Regrinding and recoating
nominal Ø d1	shank Ø d2	total length l1	cutting edge length l2			
3.00	6	50	4	10.75	11.44	Regrinding and recoating
4.00		54	5	10.05	10.75	
5.00			6	10.05	10.75	Regrinding and recoating
6.00	6	54	7	10.05	10.75	
7.00	8	58	8	15.83	16.40	Regrinding and recoating
8.00	8	58	9	14.55	15.14	
9.00	10	66	10	21.84	22.41	Regrinding and recoating
10.00	10	66	11	20.33	21.14	
12.00	12	73	12	25.53	26.22	Regrinding and recoating
14.00	14	75	14	35.23	35.93	
16.00	16	82	16	48.86	43.09	Regrinding and recoating
18.00	18	84	18	55.44	56.02	
20.00	20	92	20	73.46	74.27	Regrinding and recoating
						Regrinding and recoating
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						Regrinding and recoating
						Regrinding and recoating
						Regrinding and recoating

DIN 6527 long

F FIRE

SL program Milling cutters

Ball nose end mills, 4-fluted

DIN 6527 long

[illegible]

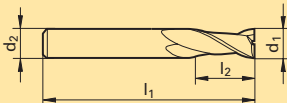
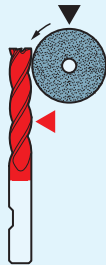
DIN 6527 long

[illegible]

SL program Milling cutters

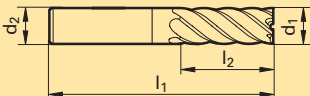
End mills, 4-fluted

Guhring std.

				Tool material	Carbide-UF
				Carbide grade	K/P
				Guhring no.	5556
				Form	HA
				Type	N
				Tolerance on cutting diameter	h10
				Surface finish	
				Helix angle	30°
					
Ø-range mm 3.00 ... 20.00					
					
				Regrinding and recoating  	
					
				Net price per piece	
				12.71	
				14.08	
				19.20	
				19.20	
				20.35	
				20.35	
				21.73	

End mills, multi-fluted

DIN 6527 long

Tool material					Carbide-UF	
Carbide grade					K/P	
Guhring no.					5745	5545
Form					HA	HB
Type					NH	NH
Tolerance on cutting diameter					h10	h10
Surface finish					F	F
Helix angle					45°	
Ø-range mm						
6.00 ... 20.00						
						
						
					Unit price in £	
Diameter mm		Lengths mm				
nominal Ø d1	shank Ø d2	total length l1	cutting edge length l2	no. of cutting edges		
3.00	6	57	11	6	17.91	
4.00	6	57	11		17.09	
5.00	6	57	13		16.17	
6.00	6	57	13		15.25 16.06	
8.00	8	63	19		18.60 19.17	
10.00	10	72	22		28.77 29.34	
12.00	12	83	26		38.24 38.93	
14.00	14	83	26		52.33 52.33	
16.00	16	92	32	6	69.53 70.11	
18.00	18	92	32	8	80.85 81.54	
20.00	20	104	38	8	96.22 96.79	
25.00	25	121	45	10	170.48	
</						

End mills, multi-fluted

[illegible]

DIN 6527 long

[illegible]

Tools with **bold** feed column no. (FC no.) are preferred choice.

a_e = Width of cut

a_p = Depth of cut

Tool material

	Typ	Carbide-UF	Carbide-UF
		N	N
Guhring no.	DIN 6527	HA	5730
	DIN 6527	HB	5530
	Guhring std.	HA	5507
	Guhring std.	HB	5531

- * For large cutting depths on unstable machines f_z and v_c must be reduced or a 4-flute tool RF 100 (Guhring no. 5582) must be applied.
- ** To improve the surface quality, the milling angle should be 10°-15°.



$a_e = 1 \times D$

$a_e = 1 \times D$



$a_p = 0.5 \times D$

$a_p = 0.5 \times D$

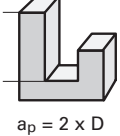
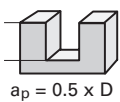
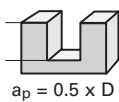
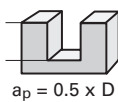
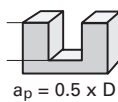
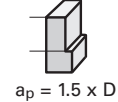
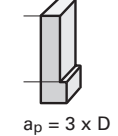
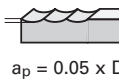
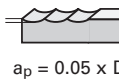
Cutter-Ø mm	Feed column no.															
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	f_z (mm/tooth)															
2.00	0.001	0.001	0.001	0.002	0.002	0.004	0.005	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.018	0.020
3.00	0.002	0.002	0.003	0.003	0.004	0.007	0.010	0.010	0.010	0.015	0.016	0.013	0.019	0.022	0.024	0.030
5.00	0.005	0.006	0.007	0.009	0.010	0.014	0.020	0.020	0.022	0.025	0.026	0.026	0.028	0.030	0.032	0.038
6.00	0.006	0.008	0.009	0.011	0.013	0.017	0.024	0.025	0.027	0.031	0.029	0.033	0.039	0.036	0.041	0.047
8.00	0.010	0.012	0.014	0.016	0.019	0.024	0.032	0.032	0.035	0.042	0.042	0.047	0.053	0.052	0.058	0.064
10.00	0.013	0.015	0.018	0.021	0.025	0.030	0.038	0.039	0.044	0.050	0.053	0.059	0.065	0.066	0.073	0.080
12.00	0.010	0.018	0.022	0.026	0.030	0.036	0.046	0.048	0.052	0.059	0.063	0.072	0.079	0.085	0.090	0.100
16.00	0.020	0.023	0.027	0.032	0.038	0.045	0.054	0.058	0.063	0.071	0.079	0.088	0.095	0.100	0.110	0.120
20.00	0.023	0.028	0.033	0.038	0.045	0.057	0.066	0.073	0.080	0.090	0.097	0.100	0.110	0.120	0.130	0.140
25.00	0.030	0.035	0.040	0.045	0.055	0.065	0.075	0.100	0.120	0.130	0.140	0.150	0.165	0.170	0.180	0.190

Material group	Material examples	Tens. strength Hard-MPa (N/mm ²) ness
Common structural steels	1.0035 S185, 1.0486 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 11SMn37 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 hard. steels	1.0301 C10, 1.1121 C10E	≤750
Alloyed case hardened steels	1.7043 38Cr4 1.5752 15NiCr13, 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	≤850 850-1000
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	>650-1000
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	≤330 HB
Stainless steels, sulphured austenitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17	≤750
Stainless steels, martensitic	1.4301 X5CrNi18-10, 1.4541 X6CrNiTi18-10 1.4057 X20CrNi17-2, 1.4122 X39CrMo17-1	750-800 850-1200
Hardened steels	–	≤40-54 HRC >54-60 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
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
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	≤850 850-1200
Al and Al-alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤450
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si	≤450
Al cast alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600
Al cast alloys > 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	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 850-1000
Duroplastics	Bakelite, Resopal, Pertinax, Moltopen	–
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	–
	a_p with f_z -correction	

v_c m/min	FC no.	v_c m/min	FC no.
85 - 105	42	85 - 105	42
81 - 99	41	81 - 99	41
85 - 105	41	85 - 105	41
63 - 77	42	63 - 77	42
85 - 105	41	85 - 105	41
76 - 94	41	76 - 94	41
63 - 77	42	63 - 77	42
76 - 94	42	76 - 94	42
63 - 77	42	63 - 77	42
90 - 110	41	90 - 110	41
76 - 94	41	76 - 94	41
54 - 66	42	54 - 66	42
85 - 105	41	85 - 105	41
76 - 94	40	76 - 94	40
76 - 94	41	76 - 94	41
63 - 77	40	63 - 77	40
45 - 55	42	45 - 55	42
45 - 55	40		
45 - 55	42	45 - 55	42
40 - 50	40	40 - 50	40
36 - 44	41	36 - 44	41
45 - 55	40		
27 - 33	40	27 - 33	40
108 - 132	41	108 - 132	41
99 - 121	40	99 - 121	40
90 - 110	41	90 - 110	41
81 - 99	40	81 - 99	40
54 - 66	40	54 - 66	40
45 - 55	40	45 - 55	40
36 - 44	40	36 - 44	40
405 - 495	43		
495 - 605	43		
198 - 242	42		
162 - 198	43		
225 - 275	44		
108 - 132	43		
90 - 110	43		
81 - 99	42		
90 - 110	42		
72 - 88	41		
72 - 88	42		
63 - 77	40		
108 - 132	40		
99 - 121	40		
1 x D = 75% 1,5 x D = 50%		1 x D = 75% 1,5 x D = 50%	

Fine finishing

Trace milling

Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF	
N		NH		W		N		NH		NH		N		N		N	
5549		5505	5506	5742	5743									5585**			
		5502	5546	5542	5543									5533**		5584**	
										5745		5729*					
						5573		5574		5545		5529*					
																	
																	
V _c m/min	Fc no.	V _c m/min	Fc no.	V _c m/min	Fc no.	V _c m/min	Fc no.	V _c m/min	Fc no.	V _c m/min	Fc no.	V _c m/min	Fc no.	V _c m/min	Fc no.	V _c m/min	Fc no.
72 - 88	39	94 - 116	43			85 - 105	42	94 - 116	43	171 - 209	48	136 - 168	45	153 - 187	48	153 - 187	48
67 - 83	38	89 - 109	42			81 - 99	41	89 - 109	42	157 - 193	47	126 - 154	44	144 - 176	47	144 - 176	47
72 - 88	38	94 - 116	42			85 - 105	41	94 - 116	42	171 - 209	47	136 - 168	44	153 - 187	47	153 - 187	47
54 - 66	39	69 - 85	43			63 - 77	42	69 - 85	43	126 - 154	46	100 - 124	43	153 - 187	46	153 - 187	46
72 - 88	38	94 - 116	42			85 - 105	41	94 - 116	42	171 - 209	47	136 - 168	44	135 - 165	47	135 - 165	47
63 - 77	38	84 - 104	42			76 - 94	41	84 - 104	42	153 - 187	47	122 - 150	44	135 - 165	47	135 - 165	47
54 - 66	39	69 - 85	43			63 - 77	42	69 - 85	43	126 - 154	46	100 - 124	43	117 - 143	46	117 - 143	46
63 - 77	39	84 - 104	43			76 - 94	42	84 - 104	43	153 - 187	46	122 - 150	43	126 - 154	46	126 - 154	46
54 - 66	39	69 - 85	43							126 - 154	45	100 - 124	42	153 - 187	45	153 - 187	45
67 - 83	38	99 - 121	42			90 - 110	41	99 - 121	42	189 - 231	47	151 - 185	44	198 - 242	47	198 - 242	47
63 - 77	38	84 - 104	42			76 - 94	41	84 - 104	42	153 - 187	47	122 - 150	44	171 - 209	47	171 - 209	47
45 - 55	39	59 - 73	43							117 - 143	46	93 - 115	43	108 - 132	46	108 - 132	46
72 - 88	38	94 - 116	42			85 - 105	41	94 - 116	42	171 - 209	47	136 - 168	44	144 - 176	47	144 - 176	47
63 - 77	37	84 - 104	41							153 - 187	45	122 - 150	42	135 - 165	45	135 - 165	45
63 - 77	38	84 - 104	42			76 - 94	41	84 - 104	42	153 - 187	47	122 - 150	44	135 - 165	47	135 - 165	47
54 - 66	37	69 - 85	41			63 - 77	40	69 - 85	41	126 - 154	45	100 - 124	42	117 - 143	45	117 - 143	45
40 - 50	39	49 - 61	43			45 - 55	42	49 - 61	43	94 - 116	46	75 - 93	43	85 - 105	46	85 - 105	46
		49 - 61	41							94 - 116	45	75 - 93	42	85 - 105	45	85 - 105	45
		49 - 61	43			45 - 55	42	49 - 61	43	94 - 116	46	75 - 93	43	85 - 105	46	85 - 105	46
		45 - 55	41			40 - 50	40	45 - 55	41	94 - 116	45	75 - 93	42	76 - 94	45	76 - 94	45
		39 - 49	42			36 - 44	41	39 - 49	42	76 - 94	46	61 - 75	43	67 - 83	46	67 - 83	46
		49 - 61	41							49 - 61	43	39 - 49	41	49 - 61	44	49 - 61	44
		29 - 37	41					29 - 37	41	54 - 66	45	32 - 40	42	49 - 61	45	49 - 61	45
94 - 116	38	118 - 146	42			108 - 132	41	118 - 146	42	220 - 270	47	132 - 162	44	198 - 242	47	198 - 242	47
85 - 105	37	108 - 134	41			99 - 121	40	108 - 134	41	202 - 248	46	121 - 149	43	189 - 231	46	189 - 231	46
81 - 99	38	99 - 121	42			90 - 110	41	99 - 121	42	180 - 220	47	108 - 132	44	171 - 209	47	171 - 209	47
67 - 83	37	89 - 109	41			81 - 99	40	89 - 109	41	157 - 193	46	94 - 116	41	144 - 176	46	144 - 176	46
		59 - 73	41			54 - 66	40	59 - 73	41					99 - 121	44	99 - 121	44
58 - 72	37	49 - 61	41			45 - 55	40	49 - 61	41	94 - 116	45	56 - 70	42				
31 - 39	37	39 - 49	41			36 - 44	40	39 - 49	41	76 - 94	44	45 - 57	41				
				297 - 363	46	297 - 363	46	297 - 363	46	810 - 990	50	486 - 594	41	720 - 880	50		
				360 - 440	46	360 - 440	46	360 - 440	46	720 - 880	50	432 - 528	41	855 - 1045	50		
		217 - 267	43			144 - 176	45	217 - 267	43	405 - 495	48	243 - 297	45	342 - 418	48		
		178 - 218	44			117 - 143	46	178 - 218	44	324 - 396	49	194 - 238	46	288 - 352	49		
				171 - 209	47	171 - 209	47	171 - 209	47	450 - 550	50			405 - 495	50		
				118 - 146	44	81 - 99	46	118 - 146	44	216 - 264	49			180 - 220	49		
		99 - 121	44			72 - 88	46	99 - 121	44	198 - 242	48	118 - 146	45	171 - 209	48		
				67 - 83	45	67 - 83	45	67 - 83	45	162 - 198	48			162 - 198	48		
		99 - 121	43			72 - 88	45	99 - 121	43	198 - 242	48	118 - 146	45	180 - 220	48		
		79 - 97	42			63 - 77	44	79 - 97	42	153 - 187	47	91 - 113	44	171 - 209	47		
				63 - 77	45	63 - 77	45	63 - 77	45	153 - 187	47			198 - 242	47		
				54 - 66	43	54 - 66	43	54 - 66	43	126 - 154	46	75 - 93	43	189 - 231	46		
				81 - 99	43	81 - 99	43	81 - 99	43	216 - 264	46						
				72 - 88	43	72 - 88	43	72 - 88	43	198 - 242	46						
3 x D = 50%		1 x D = 75% 1,5 x D = 50%		1 x D = 75% 1,5 x D = 50%		1,5 x D = 75%		1,5 x D = 75%									

Tools with **bold** feed column no. (FC no.) are preferred choice.

a_e = Width of cut

a_p = Depth of cut

Schneidstoff

Typ

Guhring no.		Typ	Carbide-UF	
			N	N
			5735*	5582
			5535*	5534*

* With this application, optimal chip evacuation must be ensured. Slot milling only recommended > Ø 5 mm.

** In the event of excessive edge wear through vibration, the feed rate should be reduced by 30%.

RF100
54HRC



$a_e = 0.5 - 1.0 \times D$

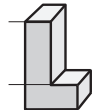


$a_p = 1 \times D$

RF100



$a_e = 0.25 \times D$



$a_p = 2 \times D$

Cutter-Ø mm	Feed column no.															
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	f_z (mm/tooth)															
2.00	0.001	0.001	0.001	0.002	0.002	0.004	0.005	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.018	0.020
3.00	0.002	0.002	0.003	0.003	0.004	0.007	0.010	0.010	0.010	0.015	0.016	0.013	0.019	0.022	0.024	0.030
5.00	0.005	0.006	0.007	0.009	0.010	0.014	0.020	0.020	0.022	0.025	0.026	0.026	0.028	0.030	0.032	0.038
6.00	0.006	0.008	0.009	0.011	0.013	0.017	0.024	0.025	0.027	0.031	0.029	0.033	0.039	0.036	0.041	0.047
8.00	0.010	0.012	0.014	0.016	0.019	0.024	0.032	0.032	0.035	0.042	0.042	0.047	0.053	0.052	0.058	0.064
10.00	0.013	0.015	0.018	0.021	0.025	0.030	0.038	0.039	0.044	0.050	0.053	0.059	0.065	0.066	0.073	0.080
12.00	0.010	0.018	0.022	0.026	0.030	0.036	0.046	0.048	0.052	0.059	0.063	0.072	0.079	0.085	0.090	0.100
16.00	0.020	0.023	0.027	0.032	0.038	0.045	0.054	0.058	0.063	0.071	0.079	0.088	0.095	0.100	0.110	0.120
20.00	0.023	0.028	0.033	0.038	0.045	0.057	0.066	0.073	0.080	0.090	0.097	0.100	0.110	0.120	0.130	0.140
25.00	0.030	0.035	0.040	0.045	0.055	0.065	0.075	0.100	0.120	0.130	0.140	0.150	0.165	0.170	0.180	0.190

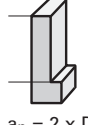
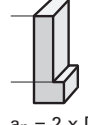
Material group	Material examples	Tens. strength Hard-MPa (N/mm ²) ness
Common structural steels	1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0425 P265GH 1.0050 E295, 1.0070 E360, 1.8937 P500NH	≤500 >500-850
Free-cutting steels	1.0718 11SMnPb30, 1.0736 11SMn37 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20	≤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 hard. steels	1.0301 C10, 1.1121 C10E	≤750
Alloyed case hardened steels	1.7043 38Cr4 1.5752 15NiCr13, 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	≤850 850-1000
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	>650-1000
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	≤330 HB
Stainless steels, sulphured austenitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17 1.4301 X5CrNi18-10, 1.4541 X6CrNiTi18-10	≤750 750-800
Stainless steels, martensitic	1.4057 X20CrNi17-2, 1.4122 X39CrMo17-1	850-1200
Hardened steels	–	≤40-54 HRC >54-60 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
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
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	≤850 850-1200
Al and Al-alloys	3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤450
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si	≤450
Al cast alloys ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600
Al cast alloys > 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	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 850-1000
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	–
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	–

a_p with
 f_z -correction

$a_p 1.5 \times D = 50\%$
 $a_e 0.25 \times D = 150\%$

$a_p 0.5 \times D = 75\%$
 $a_p 2 \times D = 50\%$

Finishing

Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF		Carbide-UF	
NH		W		NRf		HR		N		N		N		N	
5505	5506	5742	5743					5735		5582				5556	
5502	5546	5542	5543	5504**		5583**		5535	5534			5532			5543
															
$a_e = 0.5-1.0 \times D$		$a_e = 0.5-1.0 \times D$		$a_e = 0.5-1.0 \times D$		$a_e = 0.5-1.0 \times D$		$a_e = 0.1 \times D$		$a_e = 0.1 \times D$		$a_e = 0.1 \times D$		$a_e = 0.1 \times D$	
															
$a_p = 1 \times D$		$a_p = 1 \times D$		$a_p = 1 \times D$		$a_p = 1 \times D$		$a_p = 1 \times D$		$a_p = 2 \times D$		$a_p = 1 \times D$		$a_p = 2 \times D$	
V_c m/min	Fc no.	V_c m/min	Fc no.	V_c m/min	Fc no.	V_c m/min	Fc no.	V_c m/min	Fc no.	V_c m/min	Fc no.	V_c m/min	Fc no.	V_c m/min	Fc no.
170 - 208	49			97 - 119	43			212 - 260	49	139 - 171	44	157 - 193	48	103 - 127	43
157 - 193	48			90 - 110	42			194 - 238	48	127 - 157	43	144 - 176	47	94 - 116	42
170 - 208	48			97 - 119	42			212 - 260	48	139 - 171	43	157 - 193	47	103 - 127	42
126 - 154	47			72 - 88	41			158 - 194	47	109 - 135	42	117 - 143	46	81 - 99	41
170 - 208	48			97 - 119	42			212 - 260	48	139 - 171	43	157 - 193	47	103 - 127	42
151 - 185	48			86 - 106	42			194 - 238	48	121 - 149	43	144 - 176	47	90 - 110	42
126 - 154	47			72 - 88	41			158 - 194	47	103 - 127	42	117 - 143	46	76 - 94	41
151 - 185	47			86 - 106	41			188 - 230	47	121 - 149	42	139 - 171	46	90 - 110	41
126 - 154	46			72 - 88	40	72 - 88	39	158 - 194	46	103 - 127	41	117 - 143	45	76 - 94	40
189 - 231	48			108 - 132	42			236 - 290	48	134 - 164	43	175 - 215	47	99 - 121	42
151 - 185	48			86 - 106	42	86 - 106	41	188 - 230	48	121 - 149	43	139 - 171	47	90 - 110	42
113 - 139	47			64 - 80	41	64 - 80	40	139 - 171	47	90 - 112	42	103 - 127	46	67 - 83	41
170 - 208	48			97 - 119	42	97 - 119	41	212 - 260	48	139 - 171	43	157 - 193	47	103 - 127	42
151 - 185	46			86 - 106	40	86 - 106	39	194 - 238	46	121 - 149	41	144 - 176	45	90 - 110	40
151 - 185	48			86 - 106	42	86 - 106	41	188 - 230	48	121 - 149	43	139 - 171	47	90 - 110	42
126 - 154	46			72 - 88	40	72 - 88	39	158 - 194	46	103 - 127	41	117 - 143	45	76 - 94	40
94 - 116	47					54 - 66	47	121 - 149	47	79 - 97	42	90 - 110	46	58 - 72	41
67 - 83	46					54 - 66	26	121 - 149	46						
67 - 83	47			54 - 66	41			121 - 149	47	72 - 90	44	90 - 110	46		
58 - 72	46			46 - 58	40			103 - 127	46	62 - 75	43	76 - 94	45		
54 - 66	47			43 - 53	41	43 - 53	40	97 - 119	47	58 - 72	44	72 - 88	46		
31 - 39	44			25 - 31	38	25 - 31	38	61 - 75	44						
				18 - 22	38										
40 - 50	46			32 - 40	42			72 - 90	46			54 - 66	45		
157 - 193	48			126 - 154	44	126 - 154	42	255 - 313	48	182 - 224	43	189 - 231	47	135 - 165	42
144 - 176	47			115 - 141	43	115 - 141	41	255 - 313	47	163 - 201	42	189 - 231	46	121 - 149	41
130 - 160	48			104 - 128	44	104 - 128	42	231 - 283	48	152 - 186	43	171 - 209	47	112 - 138	42
112 - 138	47			90 - 110	43	90 - 110	41	194 - 238	47	127 - 157	42	144 - 176	46	94 - 116	41
76 - 94	45					61 - 75	39	134 - 164	45			99 - 121	44		
67 - 83	46			54 - 66	41			121 - 149	46	79 - 97	41	90 - 110	45	58 - 72	40
54 - 66	45			43 - 53	40			97 - 119	45	61 - 75	40	72 - 88	44	45 - 55	39
		297 - 363	46							220 - 280	46	765 - 935	50	450 - 550	45
		360 - 440	46							250 - 300	45				342 - 418
		144 - 176	44												51
117 - 143	45	117 - 143	45							220 - 250	44	373 - 457	48	225 - 275	43
		171 - 209	46							200 - 240	45	306 - 374	49	180 - 220	44
		81 - 99	45							210 - 260	46				197 - 241
										110 - 120	45	198 - 242	49	135 - 165	44
		72 - 88	44	117 - 143	44	117 - 143	42			100 - 120	44	180 - 220	48	108 - 132	43
		67 - 83	44	94 - 116	44					90 - 110	44	144 - 176	48	90 - 110	43
		72 - 88	44	117 - 143	44	117 - 143	42			100 - 120	44	180 - 220	48	108 - 132	43
63 - 77	43	63 - 77	43	87 - 107	43	87 - 107	41					135 - 165	47		
63 - 77	43	63 - 77	43	87 - 107	43										72 - 90
54 - 66	42	54 - 66	42	72 - 90	42										48
81 - 99	42	81 - 99	42												93 - 115
72 - 88	42	72 - 88	42												47
															47
$a_p 0.5 \times D = 120\%$ $a_p 2 \times D = 50\%$		$a_p 0.5 \times D = 120\%$ $a_p 2 \times D = 50\%$		$a_p 1.5 \times D = 50\%$ $a_e 0.25 \times D = 140\%$		$a_p 0.5 \times D = 120\%$		$a_p 2 \times D = 50\%$		$a_p 3 \times D = 50\%$		$a_p 2 \times D = 50\%$		$a_p 3 \times D = 50\%$	

for through holes



nominal Ø-range
M 3 ... M 10

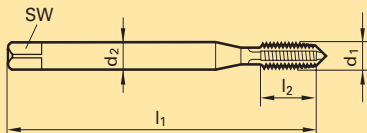
SW

d_2

d_1

l_1

l_2



○ bright ● steam tempered ● nitrided ● **A** TiAlN ● **C** TiCN ● **S** TiN

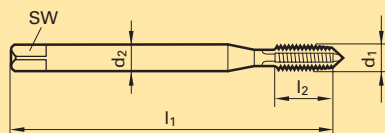
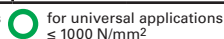
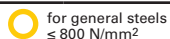
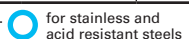
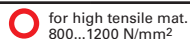
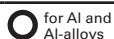
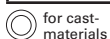
for through holes

DIN 371



Tool material	HSS-E				
Guhring no.	5561	5586	5557	5550	5595
Type	N	N	AI	GG	GG
Form	B	B	B	C	C
Tolerance zone	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	6HX
Surface finish					

nominal Ø-range
M 3 ... M 10

[illegible]

DIN 376



Tool material	HSS-E
Guhring no.	5563
Type	N
Form	B
Tolerance zone	ISO 2/6H
Surface finish	

[illegible]

○ bright ● steam tempered ● nitrided ● **A** TiAlN ● **C** TiCN ● **S** TiN

~DIN 371



Tool material	HSS-E
Guhring no.	5598
Type	N
Form	C
Tolerance zone	6HX
Surface finish	S

SL program FlutelessTaps

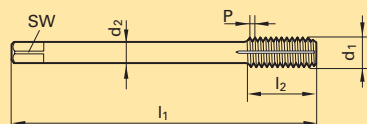
for through holes and blind holes

~DIN 376



Tool material	HSS-E
Guhring no.	5599
Type	N
Form	C
Tolerance zone	6HX
Surface finish	S

nominal Ø-range
M 12 ... M 16

[illegible]

○ bright ● steam tempered ● nitrided **A** TiAlN **C** TiCN **S** TiN

for blind holes

DIN 371



Tool material	HSS-E			
Guhring no.	5554	5592	5552	5591
Type	N R40	N R40	H R40	H R40
Form	C	C	C	C
Tolerance zone	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H
Surface finish				

[illegible]

DIN 371



Tool material	HSS-E				
Guhring no.	5553	5596	5555	5594	5551
Type	VA R40	VA R40	N R40	N R40	AI R45
Form	C	C	C	C	C
Tolerance zone	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H
Surface finish					

[illegible]

○ bright ● steam tempered ● nitrided **A** TiAlN **C** TiCN **S** TiN

for blind holes

DIN 376



Tool material

HSS-E

Guhring no.

5589

Type

N R40

Form

C

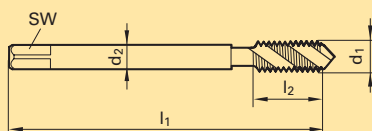
Tolerance zone

ISO 2/6H

Surface finish



nominal Ø-range
M 12 ... M 20

[illegible]for cast-
materials

for Al and Al-alloys



for high tensile mat.
800...1200 N/mm²



for stainless and
acid resistant steels



for general steels
 $< 800 \text{ N/mm}^2$



for universal applications
 $\leq 1000 \text{ N/mm}^2$

DIN 371



Tool material	Carbide-UF
Guhring no.	5593
Type	H
Form	C
Tolerance zone	ISO 2/6H
Surface finish	

$$IC \geq M5$$
[illegible]

○ bright

SL program Reamers

NC machine chucking reamers

Guhring std.

Product information

- $\varnothing > 4,0$ mm with highly unequal flute spacing
- left hand spiral flutes
- tolerance:
from $\varnothing 0.98$ to 5.03 mm:
 $0.000/+0.004$
from $\varnothing 5.97$ to 12.05 mm:
 $0.000/+0.005$

NC machine chucking reamers are similar to DIN 8093 with straight shank (h6) for standardised tool clamping in hydraulic or shrink fit chucks. The combination of NC machine chucking reamer and hydraulic, high precision clamping or shrink fit chuck respectively offers highest concentricity and process reliability for the production of holes to required tolerances.

Tool material

Carbide grade

Guhring no.

Form

Type

Tolerance

Surface finish

Cutting direction

Carbide-UF

K10

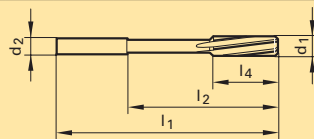
5527

see product information



right

$\varnothing$ -range mm
0.98 ... 4.01



Diameter mm		Lengths mm				
nominal Ø d ₁	shank Ø d ₂	total length l ₁	effective length l ₂	flute length l ₄	no. of flutes z	
Unit price in £						
0.980	4	50	22	6	3	25.91
0.990	4	50	22	6		25.91
1.000	4	50	22	6		22.39
1.010	4	50	22	6		25.91
1.020	4	50	22	6		25.91
1.030	4	50	22	9		25.91
1.480	4	50	22	9		25.91
1.490	4	50	22	9		25.91
1.500	4	50	22	9		22.71
1.510	4	50	22	9		25.91
1.520	4	50	22	9		25.91
1.530	4	50	22	9	3	25.91
1.980	4	50	22	12	4	25.91
1.990	4	50	22	12		25.91
2.000	4	50	22	12		22.71
2.010	4	50	22	12		25.91
2.020	4	50	22	12		25.91
2.030	4	50	22	12		25.91
2.480	4	60	32	16		25.91
2.490	4	60	32	16		25.91
2.500	4	60	32	16		27.90
2.510	4	60	32	16		25.91
2.520	4	60	32	16		25.91
2.530	4	60	32	16	4	25.91
2.970	4	64	36	17	6	26.90
2.980	4	64	36	17		26.90
2.990	4	64	36	17		26.90
3.000	4	64	36	17		23.81
3.010	4	64	36	17		26.90
3.020	4	64	36	17		26.90
3.030	4	64	36	17		26.90
3.970	4	77	45	21		31.87
3.980	4	77	45	21		31.87
3.990	4	77	45	21		31.87
4.000	4	77	45	21		28.00
4.010	4	77	45	21		31.87

○ bright

SL program Reamers

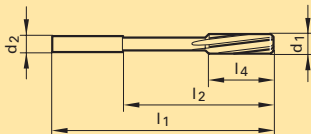
NC machine chucking reamers Guhring std.

Product information

- Ø > 4,0 mm with highly unequal flute spacing
- left hand spiral flutes
- tolerance:
 - from Ø 0.98 to 5.03 mm: 0.000/+0.004
 - from Ø 5.97 to 12.05 mm: 0.000/+0.005

NC machine chucking reamers are similar to DIN 8093 with straight shank (h6) for standardised tool clamping in hydraulic or shrink fit chucks. The combination of NC machine chucking reamer and hydraulic, high precision clamping or shrink fit chuck respectively offers highest concentricity and process reliability for the production of holes to required tolerances.

Tool material	Carbide-UF
Carbide grade	K10
Guhring no.	5527
Form	
Type	
Tolerance	see product information
Surface finish	
Cutting direction	right

Ø-range mm 4.20 ... 11.97							
							
Diameter mm		Lengths mm					
nominal Ø d ₁	shank Ø d ₂	total length l ₁	effective length l ₂	flute length l ₄	no. of flutes z	Unit price in £	
4.020	4	77	45	21	6	31.87	
4.030	4	77	45	21		31.87	
4.970	6	93	59	26		34.62	
4.980	6	93	59	26		34.62	
4.990	6	93	59	26		34.62	
5.000	6	93	59	26		31.53	
5.010	6	93	59	26		34.62	
5.020	6	93	59	26		34.62	
5.030	6	93	59	26		34.62	
5.970	6	93	57	26		37.38	
5.980	6	93	57	26		37.38	
5.990	6	93	57	26		37.38	
6.000	6	93	57	26		34.29	
6.010	6	93	57	26		37.82	
6.020	6	93	57	26		37.82	
6.030	6	93	57	26		37.82	
7.000	8	109	69	31		34.62	
7.970	8	117	75	33		47.63	
7.980	8	117	75	33		47.63	
7.990	8	117	75	33		47.63	
8.000	8	117	75	33		43.33	
8.010	8	117	75	33		47.63	
8.020	8	117	75	33		47.63	
8.030	8	117	75	33		47.63	
8.040	8	125	75	33		47.63	
9.000	10	133	81	36		47.63	
9.970	10	133	87	38		54.58	
9.980	10	133	87	38		54.58	
9.990	10	133	87	38		54.58	
10.000	10	133	87	38		51.82	
10.010	10	133	87	38		54.58	
10.020	10	133	87	38		54.58	
10.030	10	133	87	38		54.58	
10.040	10	133	87	38		54.58	
10.050	10	133	87	38		54.58	
11.970	12	151	105	44	6	65.71	

bright

GUHRING NAVIGATOR NC machine chucking reamers

Tools with **bold** feed column no. are preferred choice.

For blind holes with close diameter tolerances choose straight-fluted reamers.

Tool material/Carbide grade

Form

Surface finish

Carbide/K10

—

○

Gühr.
no.

straight

Guhring std.

5527

Reamer- Ø mm	Feed column no.				
	71	72	73	74	75
	f (mm/rev.)				
< 4.00	0.080	0.100	0.125	0.300	0.500
4.00	0.100	0.125	0.160	0.300	0.500
5.00	0.100	0.125	0.160	0.400	0.700
6.30	0.125	0.160	0.200	0.400	1.000
8.00	0.160	0.200	0.250	0.600	1.400
10.00	0.200	0.250	0.315	0.600	1.400
12.50	0.200	0.250	0.315	0.800	1.800
16.00	0.250	0.315	0.400	0.800	2.200
20.00	0.315	0.400	0.500	0.800	2.200
25.00	0.400	0.500	0.630	1.000	2.500
31.50	0.400	0.500	0.630	1.000	3.000
40.00	0.500	0.630	0.800	1.200	3.000
50.00	0.630	0.800	1.000	1.400	3.000
> 50.00	0.800	1.000	1.250	1.600	3.000

○ bright

Coolant:

● soluble oil

● neat oil

○ air



Material group	Material examples <i>Figures in bold = material no. to DIN EN 10 027</i>	Tensile strength Hard- N/mm ² ness	Cool- ant	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	● ●	18 16	72 72
Free-cutting steels	1.0718 11SMnPb30, 1.0736 115Mn37 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20	≤850 850-1000	● ●	18 16	72 72
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	● ● ●	18 16 14	71 71 71
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	● ●	14 12	71 71
Unalloyed case hardened steels	1.0301 C10, 1.1121 C10E	≤750	●	18	71
Alloyed case hardened steels	1.7043 38Cr4 1.5752 14NiCr14, 1.7131 16MnCr5, 1.7264 20CrMo5	850-1000 1000-1200	● ●●	14 12	71 71
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-1000 1000-1200	● ●●	14 12	71 71
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	● ●●	12 10	71 71
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 61CrV4	≥650-1000	●●	10	71
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	≤330 HB	●●	10	
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	●● ●● ●●	8 6 6	71 71 71
Hardened steels	—	≤40-48 HRC >48-60 HRC	●● ●●		
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200	●●	6	71
Cast iron	EN-GJL-100 ... EN-GJL-200 (previously GG10 ... GG20) EN-GJL-250 ... EN-GJL-350 (previously GG25 ... GG45)	≤240 HB <300 HB	● ●	20 18	71 71
Spheroidal graphite and malleable cast iron	EN-GJMW-350-4, EN-GJMB-550-4, EN-GJS-500-7 (prev. GTW35, GTS55, GGG50) EN-GJMB-700-2, EN-GJS-700-2 (prev. GTW65, GTS70, GGG70)	≤240 HB <300 HB	● ●	20 18	71 71
Chilled cast iron	—	≤350 HB	●	4	
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	●● ●●	10 10	71 71
Aluminium and Al-alloys	3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400	●	30	73
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1.5	≤450	●	30	73
Al cast iron ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600	● ●	40 30	72 72
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450	●	25	72
Copper, low-alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnNb	≤400	●	25	72
Brass, short-chipping long-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5	≤600 ≤600	● ●	35 30	72 72
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850	●● ●●	35 30	72 72
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 850-100	●● ●●	30 25	72 72
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	—	●	20	73
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	—	●	20	73
Kevlar	Kevlar	—	●	20	73
Glass, carbon concent. plastics	GFK/CFK	—	●	20	73



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