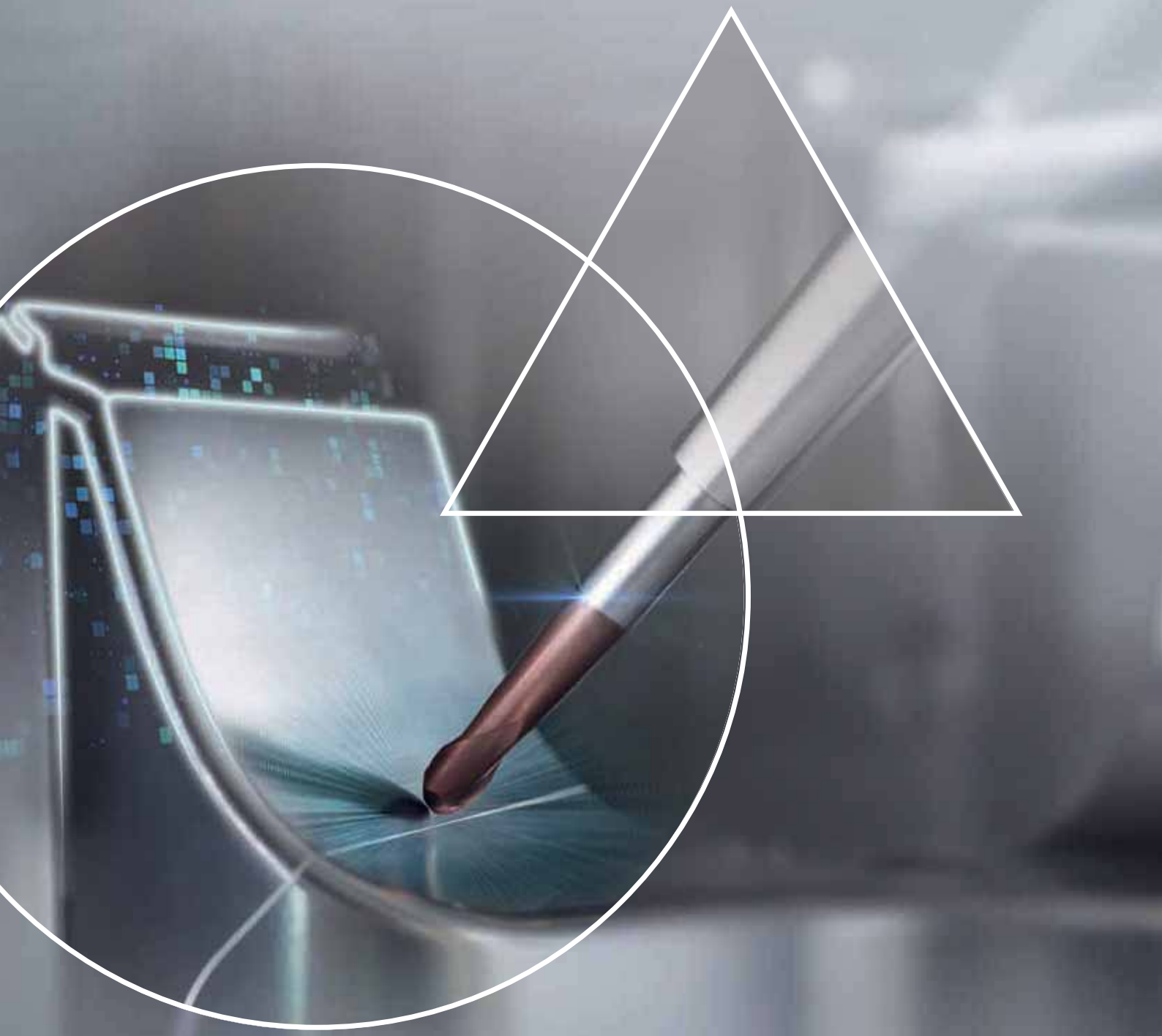
GÜHRING



Mould & Die



8,000
employees worldwide

900
sales representatives worldwide



100,000
articles in the standard range



Quality
Made in Germany



1.1 billion
turnover



2,400
tonnes of carbide annually



48
country subsidiaries

**You benefit from 125 years of experience in tool development.
Our range of cutting tools is well established in the market,
has been specially optimised for the requirements of mould & die
and has been expanded with additional dimensioning and new products.
In addition to quantity, quality also matters, we have therefore invested
in specialised production and measurement technologies at our site in Germany –
for tools you can rely on.**

GÜHRING
Perfection in Machining

Manufacturer's process optimisation

+ guaranteed process reliability with the highest quality
+ µ-precise solid carbide milling cutters for high precision requirements
+ tool range in stock

We solve the issues of your deadline pressure, indispensable process reliability and requirements for tolerance and surface – with the largest portfolio of standard tools on the market, including specially designed tools for mould & die, with our expertise as a manufacturer. In this way, we counteract pressures due to cost, avoid expensive manual reworking and support you in maintaining your delivery reliability.



MOULD & DIE

YOUR PARTNER

Far more than just machining

PROCESS CONSULTING & MACHINING COMPETENCE

+ your partner at your side
+ comprehensive know-how
+ process automation

- Industry management
- Field staff
- Product management
- Application engineers
- CAM specialists

As a machining professional, we are at your side throughout the entire machining process. Thanks to our own sales network of more than 900 tool specialists worldwide, we are always close by. This guarantees first-class support and fast response times. In addition, our CAM specialists provide support for application-related questions and process optimisation.

OUR PRODUCTS

+ highest quality
+ comprehensive range of tools
+ fast availability

- Milling tools
- Drilling tools
- Threading tools
- Reaming tools
- Clamping systems
- Accessories

Benefit from a stocked tool range in the area of milling, drilling, reaming and threading as well as customer-specific special tools. With various clamping devices and corresponding accessories, we offer everything you need for a successful machining process.

TOOL MANAGEMENT

+ uncover potential for improvement
+ save up to 25 % in process costs
+ perfecting processes

- Gühring Tool Management Software
- Tool Manager

Tool Manager digitalises processes for your tools and applications.

- TM dispensing systems
- Process data analysis

Gühring makes more out of your tools: With the Gühring Tool Management Software (GTMS) and our dispensing systems, you can control your complete tool supply and evaluate the wear data. Or you can hand over this work to our tool managers who apply continuous analysis to optimise your processes.





DIGITAL SERVICES

+ all tool-relevant data available quickly and easily
+ immediate help via various media

CAD data

Would you like to simulate your machining or manage your tools using drawings?
We provide you with standard-compliant CAD data and 3D models free of charge in our online shop or in the CAD portal.

Cutting data

You can also obtain all cutting data for your machining in our online shop:
Simply enter information about your process and the system calculates the optimal parameters.

Online shop
E-Learning
Web seminars

With our software solutions, you can automate processes and save time and money.
We also provide you with free CAD data and 3D models for CAD simulation and the optimum cutting data for your machining.
If you have any questions, you can get immediate help on several channels.

RECONDITIONING

+ original quality reconditioning
+ pick-up and delivery service for on-time logistics

Re-grinding
Re-coating

Even the most resistant tool wears out under heavy use.
Gühring restores its original performance by professionally regrinding and recoating with original geometries and coatings.
This saves you money, with more than 50 service centres worldwide guaranteeing fast service.

For more information about our services and availability in your country, please contact us.

SUCCESS STORY

Success in mould making starts with the supplier

The project

Decades of know-how, competent employees and state-of-the-art machines –
this is what precision mould maker Color Metal relies on in the production of injection moulds.
With 95 employees, the company produces around the clock.
For Color Metal, it is clear: There is also no room for compromise as a tool supplier.
This is why the company has been relying on reliable tools from Gühring for decades.
A collaboration that benefits both sides. Color Metal produces with process reliability
and Gühring collects valuable know-how for the champions league of tool development – mould making.

color metal

Giving shape to ideas

» The time and cost pressure in mould making is enormous, so there is no room for imprecise work and errors. In Gühring, we have found a technology partner on an equal footing who has the same high quality standards for their tools as we do for our moulds. «

Otmar Gutmann
Managing Director, Color Metal GmbH

HEITERSHEIM
Baden-Württemberg

95
employees

4,200 m²
production area

21
machines

INJECTION MOULDS
up to 1.0 x 1.5 m

AUTOMATIC LOADING
of machines for continuous 24/7 operation

NETWORKED SYSTEM PRODUCTION
through high-tech machinery

TOOLMAKER OF THE YEAR
an initiative of the RWTH Aachen Machine Tool Laboratory & the Fraunhofer Institute for Production Technology



Otmar Gutmann
Managing Director, Color Metal GmbH

Rolf Ehrler
Product Manager for Milling, Gühring KG

3 reasons to collaborate

That's why mould making relies on Gühring:

01

Tool range in stock
Quality and process reliability, even in hard milling

02

Holistic expertise
Tool and process knowledge directly from the manufacturer

03

Secure tool management
Tool life cycle and test equipment management at a glance

Tool management made easy

Save 20 % on tool costs with TM cabinet and software

Finding instead of searching saves money

Tools lying around, but never the right one to hand: searching for tools takes an incredible amount of time. All tools have their place in our tool management cabinets. Tidy, locked, with controlled dispensing.
The example calculation shows how much it costs to search for tools every year:

15 MIN. SEARCH TIME
daily at 200 working days

x

20 EMPLOYEES
in production

x

€30 HOURLY WAGE
per production employee

= 30,000 €
per year

COST SAVINGS
in the tool search



6 reasons why a tool management system revolutionises your production in mould making:

1

BUY FEWER REPLACEMENT TOOLS

TM cabinet with electronically locked drawers
"Actually, we should already have this tool somewhere" – How many times have you thought about this and still reordered the tool? With an electronic dispensing system, untraceable tools and loss are a thing of the past. Your employees' awareness of tool consumption is also raised or raised beyond budget limits.

2

MANAGEMENT OF MEASURING AND OPERATING EQUIPMENT

Software-based storage and documentation
If test equipment is not accurately calibrated and documented, you face real problems – not to mention manufacturing errors – during the next audit. A tool management system supports you in the central storage and tracking of testing and measuring equipment. In the software, you define calibration intervals and log measurement results.

3

IDENTIFY POTENTIAL SAVINGS

Customised reporting
With a TM system, you have a complete overview of your total tool costs:
You can create monthly consumption reports and infographics and evaluate them according to different criteria such as storage unit, period, product, cost centre, tool type, etc.

4

FASTER ORDER PLANNING

Clever use of parts lists and tool data
Plan your production orders more efficiently: Define tool parts lists instead of individual components, view a history of component parts lists and use all tool data such as 2D drawings and CAD models.

5

SIMPLIFIED REGRINDING MANAGEMENT

Tool life cycle overview
Regrinding is generally cheaper than a new purchase.
The TM software records all tool data, such as the remaining tool life or the number of regrinds to date. The software can also automatically trigger a regrinding job.

6

20 % LESS PROCESS COSTS WHEN PURCHASING TOOLS

Automated reordering
How much time do you spend ordering standard items? Too much. Enter minimum stock levels for your common tools in the tool management software and the system automatically reorders if stock levels fall below the minimum – no more oversupply or undersupply.

OUR DIGITAL SERVICES

made by GÜHRING

Whether you are active in work preparation, tool management, design, production, quality assurance, purchasing or controlling – our digital services make your job easier.



scan me

Innovative software solutions automate your procurement processes, help to prevent system failures and discover potential savings in your production. This reduces your process costs and saves you time and money in your daily work. We also provide you with all necessary data and information on all machining in mould & die. If you need support, our machining professionals offer immediate help via various digital channels.

NAVIGATOR
The easy product finder: The Navigator guides you to the best tool for your application

CUTTING DATA
We provide you with the right cutting values for every machining task

ONLINE SHOP
Make it easy for yourself: Order tools at the click of a mouse in the Gühring online shop

CAD DATA AND 3D MODELS
Free download of compliant drawings and 3D models for each of your use cases

SOFTWARE CNC GÜHRO THREADMILL
Find the optimal CNC range for your thread milling cutter

GÜHRING TOOL MANAGEMENT SOFTWARE
With GTMS, you can control your entire tool management and optimise your production

GÜHRING ACADEMY
You never stop learning: The Gühring Academy offers you free online further training

EXPERT CHAT
No bots: Chat with us personally!

WHATSAPP
Quick help via WhatsApp when things get stuck: +49 172 6585353

SERVICE HOTLINE
Technical advice and support via our customer care hotline: 00800 2607 2607

LIVE VIDEO SUPPORT
Fast, contactless and interactive: Solve problems using remote analysis with live video support

OCI PUNCHOUT
More convenient ordering: These two interfaces are where the Gühring shop and ERP system merge

DATA INTERFACE
No more doing the same work twice: Simply connect your ERP, Gühring online shop and TM cabinet

For more information about our services and availability in your country, please contact us.

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Component courtesy of Langer GmbH & Co. KG

MILLING

1

Solid carbide ball nose end mills	*P. 29*
Solid carbide Torus end mills	*P. 55*
Solid carbide end mills	*P. 78*
Solid carbide high-performance milling cutters for steel	*P. 88*
Solid carbide high-performance milling cutters for Al & copper	*P. 135*
High-performance milling cutters for graphite & FRP	*P. 143*

MILLING OVERVIEW



P M N H S K

Solid carbide ball nose end mills

- High-precision, µ-precise full-radius geometry for copy milling and finishing of hardened forms and inserts up to 65 HRC. Four-flute full-radius end mills for softer and harder materials are available for time-saving pre-cutting with high feed rates.

P M N H S K

Solid carbide Torus end mills

- High-precision Torus geometry for copy milling and finishing of hardened shapes and mould inserts up to 65 HRC. For roughing of soft and hard materials high-feed milling cutters with internal cooling are available.

H

Solid carbide end mills

- Solid carbide end mills with corner protection chamfers or corner radii with new patented groove profiles for roughing and µ-precise finishing of hardened shapes, pockets, guides and grooves up to 65 HRC. The new solid carbide substrate in combination with the innovative groove profile and our wear-resistant ultra-hard coatings enable unprecedented feed rates with exceptional smoothness in hardened materials.

P

Solid carbide high-performance milling cutters for steel

- Universal high-performance geometries for steel processing cover all machining tasks such as modern dynamic GTC roughing, slotting and plunge strategies. The solid carbide milling cutters enable the roughing and finishing of deep pockets and guides in all soft to highly tempered toolmaking steels.

N

Solid carbide high-performance milling cutters for aluminium and copper

- Our extremely sharp and polished flute geometries are ideally suited for soft and tough copper and aluminium alloys. The solid carbide end mills, corner radius and full radius milling cutters achieve high machining performance and perfect surface finish qualities.

O

High-performance milling cutters for graphite and fibre-reinforced plastics

- The extremely wear-resistant and durable diamond-coated solid carbide milling cutters and PCD tools with internal cooling, corner chamfers, corner or full radius are perfect for use in graphite electrode processing and abrasive fibres.



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P. 55



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P. 88



P. 135

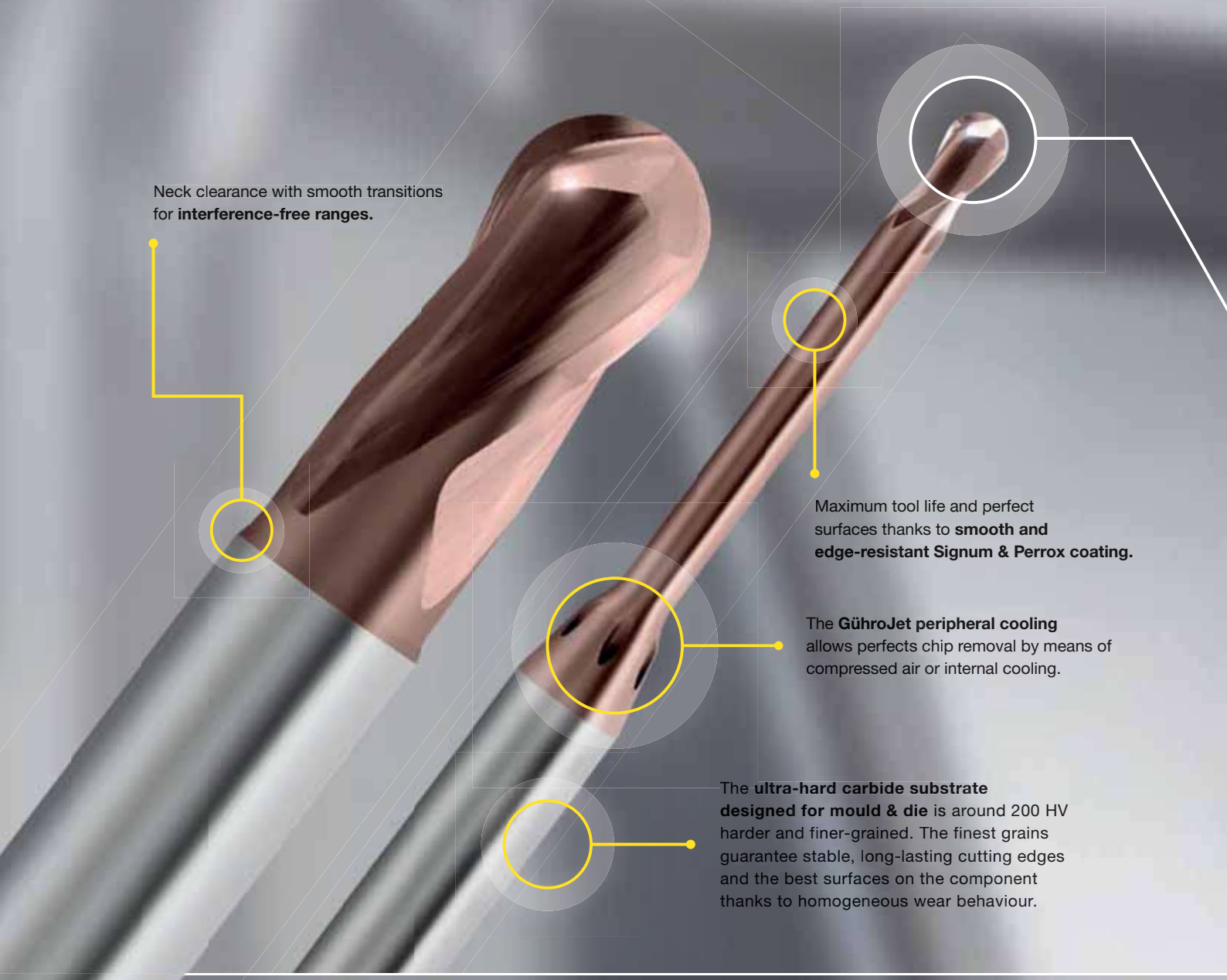


P. 143

G-MOLD

NEW

New milling cutters
specially designed for mould making



Neck clearance with smooth transitions for **interference-free ranges.**

Maximum tool life and perfect surfaces thanks to **smooth and edge-resistant Signum & Perrox coating.**

The **GühroJet peripheral cooling** allows perfects chip removal by means of compressed air or internal cooling.

The **ultra-hard carbide substrate designed for mould & die** is around 200 HV harder and finer-grained. The finest grains guarantee stable, long-lasting cutting edges and the best surfaces on the component thanks to homogeneous wear behaviour.

G-Mold programme from p. 29

Precision tool

G-Mold **µ 65 65 B**

Form

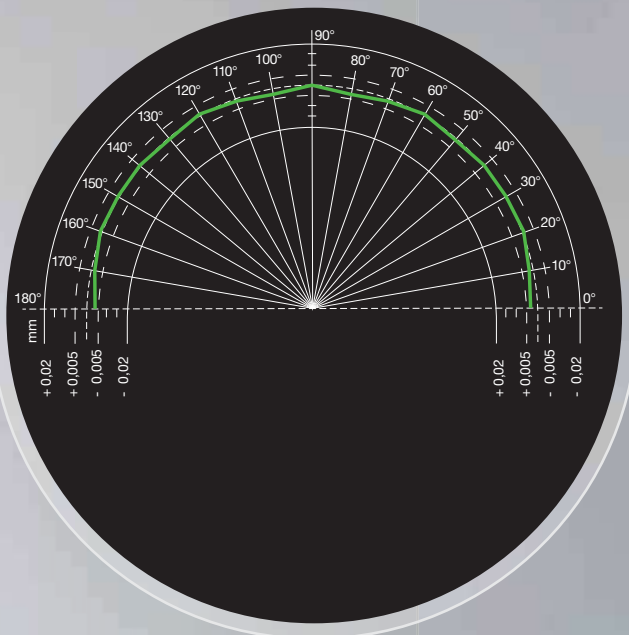
B = Ballnose
T = Torus
F = Finisher
FR = Radiusfinisher
U = Universal
HF = High Feed

suitable for up to 48/55/65 HRC

High-precision milling cutters

G-Mold µ

µ-precise radius accuracy
and **line shape**
for reproducible component shape accuracy



G-Mold µ programme from p. 29

Ball nose end mills G-Mold µ 65 B

P	M	K	N	S	H	Tool illustration	Z	Hardness	Cutting edge form	Length	Helix angle °	Tool material	Surface	d1/mm	Article no.	Page
○		•			•		2	65 HRC	R±0,005		25°	VHM	X	0.200 - 12.000	6815	29
○		•			•		2	65 HRC	R±0,005		25°	VHM	X	0.200 - 12.000	6816	30
○		•			•		2	65 HRC	R±0,005		25°	VHM	X	0.200 - 12.000	6817	31
○		•			•		2	65 HRC	R±0,005		25°	VHM	X	0.200 - 12.000	6818	32
○		•			•		2	65 HRC	R±0,005		25°	VHM	X	0.200 - 8.000	6819	33

Ball nose end mills G-Mold 65 B

P	M	K	N	S	H	Tool illustration	Z	Hardness	Cutting edge form	Length	Helix angle °	Tool material	Surface	d1/mm	Article no.	Page
○		•			•		2	65 HRC	R±0,01		30°	VHM	X Y	0.500 - 12.000	6832	34
○		•			•		2	65 HRC	R±0,01		30°	VHM	X Y	0.500 - 12.000	6833	35
○		•			•		2	65 HRC	R±0,01		30°	VHM	X Y	0.500 - 10.000	6834	36
○		•			•		4	65 HRC	R±0,02		30°	VHM	X Y	1.000 - 12.000	6835	37
○		•			•		4	65 HRC	R±0,02		30°	VHM	X Y	1.000 - 12.000	6836	38

Ball nose end mills G-Mold 55 B

P	M	K	N	S	H	Tool illustration	Z	Hardness	Cutting edge form	Length	Helix angle °	Tool material	Surface	d1/mm	Article no.	Page
•	•	•	○	•	•		2	55 HRC	R±0,01		30°	VHM	X Y	0.500 - 12.000	6844	39
•	•	•	○	•	•		2	55 HRC	R±0,01		30°	VHM	X Y	0.500 - 12.000	6845	40
•	•	•	○	•	•		2	55 HRC	R±0,01		30°	VHM	X Y	0.500 - 10.000	6846	41
•	•	•	○	•	•		2	55 HRC	R±0,01		30°	VHM	X Y	0.500 - 8.000	6847	42
•	•	•	○	•	•		4	55 HRC	R±0,02		30°	VHM	X Y	1.000 - 12.000	6848	43
•	•	•	○	•	•		4	55 HRC	R±0,02		30°	VHM	X Y	1.000 - 12.000	6849	44

Ball nose slot drills (2-fluted)

P	M	K	N	S	H	Tool illustration	Z	Hardness	Cutting edge form	Length	Helix angle °	Tool material	Surface	d1/mm	Article no.	Page
•	•	•	•	•	○		2	48 HRC	R±0,05		30°	VHM	F	0.500 - 20.000	3679	45
•	•	•	•	•	○		2	48 HRC	R±0,05		30°	VHM	F	0.500 - 20.000	3049	45

XL ball nose slot drills (2-fluted)

P	M	K	N	S	H	Tool illustration	Z	Hardness	Cutting edge form	Length	Helix angle °	Tool material	Surface	d1/mm	Article no.	Page
•	•		•	•			2	48 HRC	R±0,05		30°	VHM	F	3.000 - 12.000	3030	46

Ball nose end mills (4-fluted)

P	M	K	N	S	H	Tool illustration	Z	Hardness	Cutting edge form	Length	Helix angle °	Tool material	Surface	d1/mm	Article no.	Page
•	○	•	○	•	○		4	48 HRC	R±0,05		30°	VHM	F	4.000 - 20.000	3727	47

P	M	K	N	S	H	Tool illustration	Z	Hard-ness	Cutting edge form	Length	Helix angle °	Tool material	Sur-face	d1/mm	Article no.	Page
Ratio end mills RF 100 VA																
●	●	○	●	●	○		4	48 HRC	R ±0,05		36° 38°	VHM	a	4.000 - 25.000	6707	48
●	●	○	●	●	○		4	48 HRC	R ±0,05		36° 38°	VHM	a	4.000 - 25.000	6708	48
XL ball nose end mills (4-fluted)																
●	●	○	○	●			4		R ±0,05		30°	VHM	F	3.000 - 12.000	3043	49
Die sinking cutter holders GF 200 WP																
●	●	●	○	●	●		2		R ±0,01		0°		Ni	10.000 - 32.000	1941	50
●	●	●	○	●	●		2		R ±0,02		0°		Ni	10.000 - 25.000	1942	51
Indexable inserts round																
●	●	●	○	●	●		2	55 HRC	R ±0,03			Cermet	○	20.000 - 32.000	1947	52
●	●	●	○	●	●		2	55 HRC	R ±0,04			VHM	F	20.000 - 32.000	2520	52
Clamping screws for die sinking cutter holders																
															1691	53
Torx screwdrivers																
															1612	54
Torus end mills G-Mold µ 65 T																
○		●			●		2-4	65 HRC	R ±0,005		36°	VHM	X	0.300 - 12.000	6820	55
○		●			●		2-4	65 HRC	R ±0,005		36°	VHM	X	0.300 - 12.000	6821	56
○		●			●		2-4	65 HRC	R ±0,005		36°	VHM	X	0.300 - 12.000	6822	57
○		●			●		2-4	65 HRC	R ±0,005		36°	VHM	X	0.300 - 12.000	6823	58
○		●			●		2-4	65 HRC	R ±0,005		36°	VHM	X	0.300 - 8.000	6824	59
Torus end mills G-Mold 65 T																
○		●			●		4	65 HRC	R ±0,01		30°	VHM	X	1.000 - 12.000	6837	60
○		●			●		4	65 HRC	R ±0,01		30°	VHM	X	1.000 - 12.000	6838	62
Torus end mills G-Mold 55 T																
●	●	●	○	●	●		2	55 HRC	R ±0,01		30°	VHM	Y	0.500 - 12.000	6850	63
●	●	●	○	●	●		2	55 HRC	R ±0,01		30°	VHM	Y	0.500 - 12.000	6851	65

P	M	K	N	S	H	Tool illustration	Z	Hard-ness	Cutting edge form	Length	Helix angle °	Tool material	Sur-face	d1/mm	Article no.	Page
Torus end mills G-Mold 55 T																
•	•	•	○	•	•		2	55 HRC	R±0,01		30°	VHM	XY	1.000 - 10.000	6852	67
•	•	•	○	•	•		2	55 HRC	R±0,01		30°	VHM	XY	1.000 - 8.000	6853	68
•	•	•	○	•	•		4	55 HRC	R±0,01		30°	VHM	XY	1.000 - 12.000	6854	69
•	•	•	○	•	•		4	55 HRC	R±0,01		30°	VHM	XY	1.000 - 12.000	6855	70
High feed end mills G-Mold 65 HF																
•	•	•		•	•		4	65 HRC			30°	VHM	XY	1.000 - 16.000	6830	71
•	•	•		•	•		4	65 HRC			30°	VHM	XY	1.000 - 16.000	6814	72
•	•	•		•	•		4	65 HRC			30°	VHM	XY	1.000 - 16.000	6831	73
Slot drills with corner radius (2-fluted)																
•	•	•	•				2	48 HRC	R±0,05		30°	VHM	F	1.000 - 20.000	3561	74
End mills with corner radius (4-fluted)																
•	•	•	•	○	○		4	48 HRC	R±0,05		30°	VHM	F	1.000 - 20.000	3562	75
Multi-tooth end mills with corner radius GH 100 U																
•	•	•	•	•	○		6+	55 HRC	R±0,02		45°	VHM	F	3.000 - 20.000	3563	76
•	•		•	•	○		6	55 HRC	R±0,02		45°	VHM	R	6.000 - 20.000	6969	77
Finishing end mills G-Mold µ 48 F																
•	•	•	•	•	○		4-6	48 HRC	45°		40°	VHM	X	3.000 - 20.000	6825	78
•	•	•	•	•	○		4-6	48 HRC	45°	3xD	40°	VHM	X	3.000 - 20.000	6826	79
Finishing end mills G-Mold µ 65 F																
○		•			•		4-6	65 HRC	45°		42°	VHM	X	3.000 - 20.000	6827	80
○		•			•		4-6	65 HRC	45°	3xD	42°	VHM	X	3.000 - 20.000	6828	81
Finishing end mills G-Mold 65 F																
○		•			•		6	65 HRC	45°		42°	VHM	Y	3.000 - 20.000	6945	82
○		•			•		6	65 HRC	45°		42°	VHM	Y	3.000 - 20.000	6946	83
Finishing end mills with corner radius G-Mold 65 FR																
○		•			•		6	65 HRC	R±0,02		42°	VHM	Y	3.000 - 16.000	6947	84

P	M	K	N	S	H	Tool illustration	Z	Hard-ness	Cutting edge form	Length	Helix angle °	Tool material	Sur-face	d1/mm	Article no.	Page
Finishing end mills with corner radius G-Mold 65 FR																
○		•			•		6	65 HRC	R±0,02		42°	VHM	Y	3.000 - 16.000	6948	85
Ratio end mills G-Mold 65 U																
○		•			•		4	65 HRC	45°		40° 42°	VHM	Y	3.000 - 20.000	6943	86
○		•			•		4	65 HRC	45°		40° 42°	VHM	Y	3.000 - 20.000	6944	86
Micro-precision milling cutters MicroMill µ 55																
•	•	•	○	•	•		3-4	55 HRC	45°		30°	VHM	X	0.200 - 3.000	6829	88
Ratio end mills RF 100 Microdiver																
•	•	•	•	•	○		3	48 HRC	45°	2,5xD	40°	VHM	X	0.790 - 3.175	6808	90
•	•	•	•	•	○		3	48 HRC	45°	5xD	40°	VHM	X	1.000 - 3.175	6809	91
Ratio end mills RF 100 Diver (3-fluted)																
•	•	•	•	•			3		45°		41° 43° 45°	VHM	Y	3.000 - 20.000	6797	92
•	•	•	•	•			3		45°		41° 43° 45°	VHM	Y	3.000 - 20.000	6798	92
Ratio end mills RF 100 Diver																
•	•	•	•	•	○		4	48 HRC	45°		36° 38° 37°	VHM	Y	3.000 - 20.000	6803	93
•	•	•	•	•	○		4	48 HRC	45°		36° 38° 37°	VHM	Y	3.000 - 20.000	6804	93
•	•	•	•	•	○		4	48 HRC	45°		36° 38° 37°	VHM	Y	4.000 - 20.000	6736	94
•	•	•	•	•	○		4	48 HRC	45°		36° 38° 37°	VHM	Y	4.000 - 20.000	6737	94
Pilot end mills RF 100 P																
•	○	•	•	○	○		4	48 HRC	45°		30°	VHM	A	1.400 - 12.000	6716	95
Ratio end mills RF 100 Speed P																
•		•			○		4	48 HRC	45°		48°	VHM	A	6.000 - 25.000	6958	96
•		•			○		4	48 HRC	45°		48°	VHM	A	6.000 - 25.000	6959	96
•		•			○		4	48 HRC	45°		48°	VHM	A	6.000 - 25.000	6960	97
•		•			○		4	48 HRC	45°		48°	VHM	A	6.000 - 25.000	6961	97
Ratio end mills RF 100 Speed M																
•	•			•			4		45°		48°	VHM	A	3.000 - 20.000	6765	99

P	M	K	N	S	H	Tool illustration	Z	Hard-ness	Cutting edge form	Length	Helix angle °	Tool material	Sur-face	d1/mm	Article no.	Page
Ratio end mills RF 100 Speed M																
•	•			•			4		45°		48°	VHM	A	3.000 - 20.000	6760	99
•	•			•			4		45°		48°	VHM	A	3.000 - 20.000	6766	100
•	•			•			4		45°		48°	VHM	A	3.000 - 20.000	6761	100
Ratio end mills RF 100 5 Speed																
•	•	•	○	•			5		45°	3xD	38°	VHM	A	6.000 - 20.000	6858	101
•	•	•	○	•			5		45°	3xD	38°	VHM	A	6.000 - 20.000	6859	101
•	•	•	○	•			5		R±0,05	3xD	38°	VHM	A	6.000 - 20.000	6860	102
•	•	•	○	•			5		R±0,05	3xD	38°	VHM	A	6.000 - 20.000	6861	102
Ratio end mills RF 100 Sharp																
○	•		•	•			4		R±0,05		38° 40°	VHM	Y	3.000 - 20.000	6964	103
○	•		•	•			4		R±0,05		38° 40°	VHM	Y	3.000 - 20.000	6965	103
Ratio end mills RF 100 Sharp																
•	•		•	•			4		45°		38° 40°	VHM	P	1.000 - 20.000	6478	105
•	•		•	•			4		45°		38° 40°	VHM	P	1.000 - 20.000	6479	105
•	•		•	•			4		45°		38° 40°	VHM	P	1.000 - 20.000	6480	106
•	•		•	•			4		45°		38° 40°	VHM	P	1.000 - 20.000	6481	106
Standard Ratio end mills RF 100 U (3-fluted)																
•	•		•	•			3		45°		41° 43° 45°	VHM	R	3.000 - 20.000	6728	107
Standard Ratio end mills RF 100 U																
•	○			•	○		4	48 HRC	45°		35° 38°	VHM	R	6.000 - 20.000	6726	108
•		•			○		4	48 HRC	R±0,05		35° 38°	VHM	F	6.000 - 25.000	3872	109
•		•			○		4	48 HRC	R±0,05		35° 38°	VHM	F	6.000 - 25.000	3873	109
•		•			○		4	48 HRC	45°		35° 38°	VHM	F	6.000 - 20.000	5534	110
•		•			○		4	48 HRC	45°		35° 38°	VHM	F	4.000 - 25.000	5735	111
•		•			○		4	48 HRC	45°		35° 38°	VHM	F	4.000 - 25.000	5535	111

P	M	K	N	S	H	Tool illustration	Z	Hard-ness	Cutting edge form	Length	Helix angle °	Tool material	Sur-face	d1/mm	Article no.	Page
Standard Ratio end mills RF 100 U																
•		•			○		4	48 HRC	45°		35° 38°	VHM	F	6.000 - 20.000	3837	112
•		•			○		4	48 HRC	45°		35° 38°	VHM	F	6.000 - 20.000	3838	112
•		•			○		4	48 HRC	45°	3xD	35° 38°	VHM	F	6.000 - 20.000	3839	113
•		•			○		4	48 HRC	45°	3xD	35° 38°	VHM	F	6.000 - 20.000	3871	113
•		•			○		4	48 HRC	45°		35° 38°	VHM	F	10.000 - 25.000	5582	114
•		•			○		4	48 HRC	45°	4xD	38°	VHM	F	6.000 - 25.000	6767	115
•		•			○		4	48 HRC	45°	4xD	38°	VHM	F	6.000 - 25.000	6768	115
•	•	•		○	○		4	48 HRC	45°		36° 38°	VHM	Y	6.000 - 20.000	6970	116
•	•	•		○	○		4	48 HRC	45°		36° 38°	VHM	Y	6.000 - 20.000	6971	116
•	•	•		○	○		4	48 HRC	45°		36° 38°	VHM	Y	6.000 - 20.000	6972	117
•	•	•		○	○		4	48 HRC	45°		36° 38°	VHM	Y	6.000 - 20.000	6973	117
•		•					4		45°		30° 32°	VHM	F	6.000 - 25.000	6881	118
•		•					4		45°		30° 32°	VHM	F	6.000 - 25.000	6882	118
•		•					4		45°	3xD	30° 32°	VHM	F	6.000 - 20.000	6883	119
•		•					4		45°	3xD	30° 32°	VHM	F	6.000 - 20.000	6884	119
•		•					4		45°		30° 32°	VHM	F	6.000 - 20.000	6885	120
•		•					4		45°		30° 32°	VHM	F	6.000 - 20.000	6886	120
High-performance roughing end mills RS 100 F																
•		•			○		5-6	48 HRC	45°		45°	VHM	F	6.000 - 25.000	6889	121
•		•			○		5-6	48 HRC	45°		45°	VHM	F	6.000 - 25.000	6890	121
Hard roughing end mills GS 100 H (fine teeth)																
•		•			•		4	55 HRC	45°		20°	VHM	Y	6.000 - 20.000	3682	122
Roughing end mills GS 100 U (fine teeth)																
•	•	•	○	○			4-5		45°		30°	VHM	F	6.000 - 25.000	3723	123

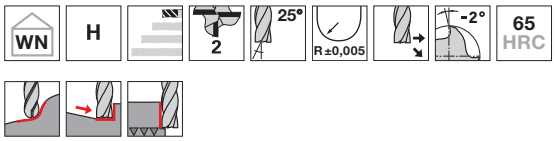
P	M	K	N	S	H	Tool illustration	Z	Hardness	Cutting edge form	Length	Helix angle °	Tool material	Surface	d1/mm	Article no.	Page
Ratio end mills Superfinish RF 100 SF																
•	•	•	•	•	○		5	48 HRC	45°		45°	VHM	F	4.000 - 25.000	6709	124
•	•	•	•	•	○		5	48 HRC	45°		45°	VHM	F	4.000 - 25.000	6710	124
•	•	•	•	•	○		5	48 HRC	45°	3xD	45°	VHM	F	4.000 - 20.000	3897	125
•	•	•	•	•	○		5	48 HRC	45°	3xD	45°	VHM	F	4.000 - 20.000	3898	125
•	•		•	•			6	48 HRC	45°		44° 45° 46°	VHM	R	8.000 - 20.000	6727	126
Multi-tooth end mills GH 100 U																
•	•	•	•	○			6+	48 HRC	45°		45°	VHM	F	6.000 - 25.000	3691	127
•	•	•	•	○			6+	48 HRC	45°		45°	VHM	F	4.000 - 32.000	3693	128
Front/back deburrer 90°																
•	•	•	○	•	•		4	55 HRC			0°	VHM	a	3.000 - 12.000	495	129
Front/back deburrer 90°, sets																
•	•	•	○	•	•		4	55 HRC			0°	VHM	a		6013	130
Chamfering milling cutters 90°																
•	•	•	•	•	○		4	55 HRC			7°	VHM	A	4.000 - 12.000	5578	131
•	•	•	•	•	○		4	55 HRC	90°		7°	VHM	A	4.000 - 12.000	5579	131
•	•	•		•	•		4	65 HRC			7°	VHM	Y	4.000 - 12.000	6784	132
•	•	•		•	•		4	65 HRC			7°	VHM	Y	4.000 - 12.000	6785	132
•	•	•	•	○	○		6	55 HRC			7°	VHM	A	6.000 - 20.000	6786	133
•	•	•	•	○	○		6	55 HRC			7°	VHM	A	6.000 - 20.000	6787	133
Chamfering milling cutters 90° SpyroTec																
•	•	○	•	•			5				20°-24°	VHM	A	6.000 - 20.000	6992	134
•	•	○	•	•			5				20°-24°	VHM	A	6.000 - 20.000	6993	134
Ball nose end mills GA 200 A																
			•				2		R ±0,02		35°	VHM	Cb	3.000 - 16.000	6984	135

P	M	K	N	S	H	Tool illustration	Z	Hard-ness	Cutting edge form	Length	Helix angle °	Tool material	Sur-face	d1/mm	Article no.	Page
Ratio end mills Alu RF 100 A																
			•				3		R±0,05		39° 40° 41°	VHM		6.000 - 25.000	3599	136
			•				3		R±0,05		39° 40° 41°	VHM		6.000 - 25.000	6729	136
			•				3		45°		39° 40° 41°	VHM	Cb	3.000 - 20.000	6978	137
			•				3		45°		39° 40° 41°	VHM	Cb	3.000 - 20.000	6979	137
			•				3		45°		39° 40° 41°	VHM		3.000 - 20.000	3472	138
			•				3		45°		39° 40° 41°	VHM		3.000 - 20.000	6702	138
			•				3		45°		39° 40° 41°	VHM		6.000 - 20.000	3473	139
			•				3		45°		39° 40° 41°	VHM		6.000 - 20.000	6703	139
			•				3		45°	3xD	39° 40° 41°	VHM		5.000 - 20.000	6730	140
			•				3		45°	3xD	39° 40° 41°	VHM		5.000 - 20.000	6731	140
			•				3		45°	4xD	39° 40° 41°	VHM		6.000 - 20.000	6732	141
			•				3		45°	4xD	39° 40° 41°	VHM		6.000 - 20.000	6733	141
			•				3		45°	5xD	39° 40° 41°	VHM		6.000 - 20.000	6734	142
			•				3		45°	5xD	39° 40° 41°	VHM		6.000 - 20.000	6735	142
Ball nose slot drills (2-fluted)																
			•				2		R±0,05		30°	VHM		3.000 - 12.000	6724	143
Ball nose end mills (4-fluted)																
			•				4		R±0,05		30°	VHM		3.000 - 12.000	6725	144
Slot drills with corner radius (2-fluted)																
			•				2		R±0,05		30°	VHM		6.000 - 12.000	6722	145
End mills with corner radius (4-fluted)																
			•				4		R±0,05		30°	VHM		6.000 - 12.000	6723	146
Slot drills XL (3-fluted)																
			•				3		45°		30°	VHM		3.000 - 16.000	6721	147
PCD slot drills (2-fluted)																
			•				2		R±0,05		2-4°	PKD		4.000 - 20.000	5492	148

PCD slot drills (2-fluted)

P	M	K	N	S	H	Tool illustration	Z	Hard-ness	Cutting edge form	Length	Helix angle °	Tool material	Sur-face	d1/mm	Article no.	Page
			•				2		R ±0,05		2-4°	PKD	○	4.000 - 20.000	5493	149

Ball nose end mills G-Mold µ 65 B



Tool material	**Solid carbide**
Surface	X
Type	H
Shank form	HA

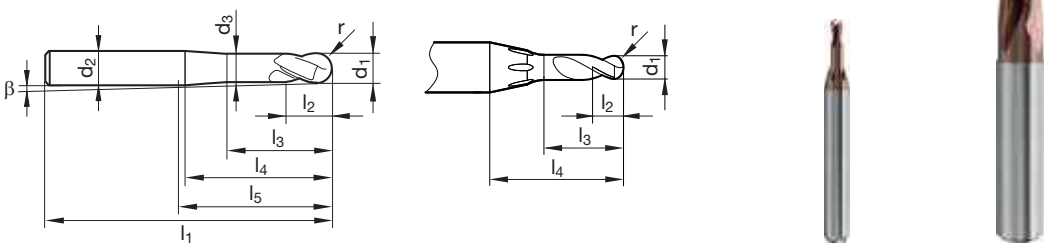
P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR

Cutting data page 150

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = 0.5 x d1 ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.2-3 mm
- centre cutting
- neck clearance



Article no. **6815**

$d1^{-0,005}_{-0,015}$ mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Order no.
0.20	4.00	0.18	50	0.2	0.50	9.2	22.0	0.10	11.80	2	6815 0.200
0.30	4.00	0.28	50	0.3	0.75	9.1	22.0	0.15	11.60	2	6815 0.300
0.40	4.00	0.38	50	0.4	1.00	9.1	22.0	0.20	11.40	2	6815 0.400
0.50	4.00	0.45	50	0.5	1.25	9.2	22.0	0.25	11.00	2	6815 0.500
0.60	4.00	0.55	50	0.6	1.50	9.2	22.0	0.30	10.80	2	6815 0.600
0.80	4.00	0.75	50	0.8	2.00	9.1	22.0	0.40	10.40	2	6815 0.800
1.00	4.00	0.92	50	1.0	2.50	9.2	22.0	0.50	9.70	2	6815 1.000
1.20	4.00	1.12	50	1.2	3.00	9.3	22.0	0.60	9.10	2	6815 1.200
1.50	4.00	1.40	50	1.5	4.00	9.6	22.0	0.75	8.00	2	6815 1.500
1.80	4.00	1.70	50	1.8	4.50	9.4	22.0	0.90	7.30	2	6815 1.800
2.00	6.00	1.85	50	2.0	5.00	14.2	14.0	1.00	8.60	2	6815 2.000
2.50	6.00	2.35	50	2.5	6.50	14.6	15.0	1.25	7.40	2	6815 2.500
3.00	6.00	2.85	50	3.0	7.50	14.4	14.0	1.50	6.60	2	6815 3.000
4.00	6.00	3.80	50	4.0	12.50	15.5	14.0	2.00	4.20	2	6815 4.000
5.00	6.00	4.80	50	5.0	15.00	16.6	14.0	2.50	2.00	2	6815 5.000
6.00	6.00	5.70	54	6.0	17.00	17.6	18.0	3.00		2	6815 6.000
8.00	8.00	7.70	58	8.0	22.00	22.6	22.0	4.00		2	6815 8.000
10.00	10.00	9.50	72	10.0	25.00	25.9	32.0	5.00		2	6815 10.000
12.00	12.00	11.50	73	12.0	30.00	30.9	28.0	6.00		2	6815 12.000

Ball nose end mills G-Mold µ 65 B

Tool material	**Solid carbide**
Surface	X
Type	H
Shank form	HA

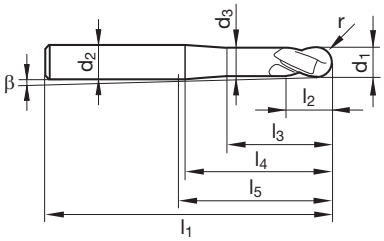
P	○
M	
K	•
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H	•

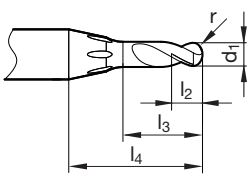
GÜHRINGNAVIGATOR

Cutting data page 150

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = 0.5 x d1 ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.2-3 mm
- centre cutting
- neck clearance





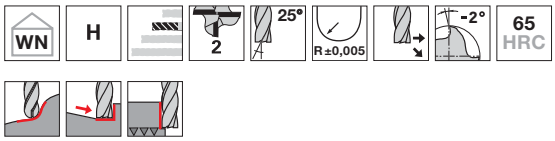




Article no. **6816**

$d1^{-0,005}_{-0,015}$ mm	d2 h5 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	r mm	β °	Z	Order no.
0.20	4.00	0.18	50	0.2	0.75	9.5	22.0	0.10	11.40	2	6816 0.200
0.30	4.00	0.28	50	0.3	1.00	9.4	22.0	0.15	11.30	2	6816 0.300
0.40	4.00	0.38	50	0.4	1.50	9.6	22.0	0.20	10.80	2	6816 0.400
0.50	4.00	0.45	50	0.5	1.50	9.5	22.0	0.25	10.70	2	6816 0.500
0.60	4.00	0.55	50	0.6	2.00	9.7	22.0	0.30	10.20	2	6816 0.600
0.80	4.00	0.75	50	0.8	3.00	10.1	22.0	0.40	9.30	2	6816 0.800
1.00	4.00	0.92	50	1.0	3.00	9.7	22.0	0.50	9.20	2	6816 1.000
1.20	4.00	1.12	50	1.2	4.00	10.3	22.0	0.60	8.20	2	6816 1.200
1.50	4.00	1.40	50	1.5	6.00	11.6	22.0	0.75	6.50	2	6816 1.500
1.80	4.00	1.70	50	1.8	6.00	10.9	22.0	0.90	6.20	2	6816 1.800
2.00	6.00	1.85	50	2.0	6.00	15.2	15.0	1.00	8.00	2	6816 2.000
2.50	6.00	2.35	50	2.5	8.00	16.1	16.0	1.25	6.70	2	6816 2.500
3.00	6.00	2.85	57	3.0	10.00	16.9	21.0	1.50	5.50	2	6816 3.000
4.00	6.00	3.80	57	4.0	14.00	17.0	21.0	2.00	3.80	2	6816 4.000
5.00	6.00	4.80	57	5.0	18.00	19.6	21.0	2.50	1.60	2	6816 5.000
6.00	6.00	5.70	57	6.0	20.00	20.6	21.0	3.00		2	6816 6.000
8.00	8.00	7.70	63	8.0	26.00	26.6	27.0	4.00		2	6816 8.000
10.00	10.00	9.50	72	10.0	31.00	31.9	32.0	5.00		2	6816 10.000
12.00	12.00	11.50	83	12.0	37.00	37.9	38.0	6.00		2	6816 12.000

Ball nose end mills G-Mold µ 65 B



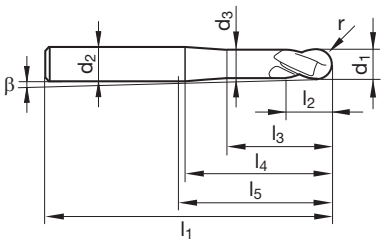
Tool material	**Solid carbide**
Surface	X
Type	H
Shank form	HA

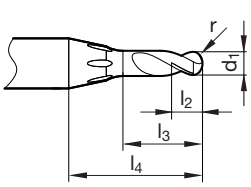
P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = 0.5 x d1 ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.2-3 mm
- centre cutting
- neck clearance







Article no. **6817**

$d1^{-0,005}_{-0,015}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.20	4.00	0.18	50	0.2	1.0	9.7	22.0	0.10	11.20	2	6817 0.200
0.30	4.00	0.28	50	0.3	1.5	9.9	22.0	0.15	10.70	2	6817 0.300
0.40	4.00	0.38	50	0.4	2.0	10.1	22.0	0.20	10.30	2	6817 0.400
0.50	4.00	0.45	50	0.5	2.5	10.5	22.0	0.25	9.60	2	6817 0.500
0.60	4.00	0.55	50	0.6	3.0	10.7	22.0	0.30	9.20	2	6817 0.600
0.80	4.00	0.75	50	0.8	4.0	11.1	22.0	0.40	8.50	2	6817 0.800
1.00	4.00	0.92	50	1.0	5.0	11.7	22.0	0.50	7.60	2	6817 1.000
1.20	4.00	1.12	50	1.2	6.0	12.3	22.0	0.60	6.80	2	6817 1.200
1.50	4.00	1.40	50	1.5	8.0	13.6	22.0	0.75	5.50	2	6817 1.500
1.80	4.00	1.70	50	1.8	9.0	13.9	22.0	0.90	4.80	2	6817 1.800
2.00	6.00	1.85	50	2.0	10.0	19.2	19.0	1.00	6.20	2	6817 2.000
2.50	6.00	2.35	50	2.5	12.5	20.6	21.0	1.25	5.10	2	6817 2.500
3.00	6.00	2.85	65	3.0	15.0	21.9	29.0	1.50	4.20	2	6817 3.000
4.00	6.00	3.80	65	4.0	20.0	23.0	29.0	2.00	2.70	2	6817 4.000
5.00	6.00	4.80	65	5.0	25.0	26.6	29.0	2.50	1.10	2	6817 5.000
6.00	6.00	5.70	65	6.0	25.0	25.6	29.0	3.00		2	6817 6.000
8.00	8.00	7.70	75	8.0	30.0	30.6	39.0	4.00		2	6817 8.000
10.00	10.00	9.50	90	10.0	40.0	40.9	50.0	5.00		2	6817 10.000
12.00	12.00	11.50	100	12.0	40.0	40.9	55.0	6.00		2	6817 12.000

Ball nose end mills G-Mold µ 65 B

Tool material	**Solid carbide**
Surface	X
Type	H
Shank form	HA

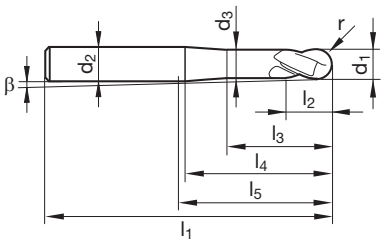
P	○
M	
K	•
N	
S	
H	•

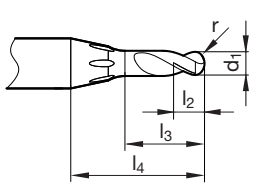
GÜHRINGNAVIGATOR

Cutting data page 150

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = 0.5 x d1 ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.2-3 mm
- centre cutting
- neck clearance



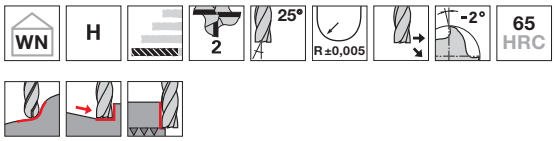




Article no. **6818**

$d1^{-0,005}_{-0,015}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.20	4.00	0.18	50	0.2	1.25	10.0	22.0	0.10	10.80	2	6818 0.200
0.30	4.00	0.28	50	0.3	2.00	10.4	22.0	0.15	10.20	2	6818 0.300
0.40	4.00	0.38	50	0.4	3.00	11.1	22.0	0.20	9.30	2	6818 0.400
0.50	4.00	0.45	50	0.5	3.00	11.0	22.0	0.25	9.20	2	6818 0.500
0.60	4.00	0.55	50	0.6	4.00	11.7	22.0	0.30	8.40	2	6818 0.600
0.80	4.00	0.75	50	0.8	5.00	12.1	22.0	0.40	7.70	2	6818 0.800
1.00	4.00	0.92	50	1.0	7.00	13.7	22.0	0.50	6.40	2	6818 1.000
1.20	4.00	1.12	50	1.2	8.00	14.3	22.0	0.60	5.80	2	6818 1.200
1.50	4.00	1.40	50	1.5	10.00	15.6	22.0	0.75	4.80	2	6818 1.500
1.80	4.00	1.70	55	1.8	12.00	16.9	27.0	0.90	3.90	2	6818 1.800
2.00	6.00	1.85	57	2.0	12.00	21.2	21.0	1.00	5.60	2	6818 2.000
2.50	6.00	2.35	57	2.5	15.00	23.1	23.0	1.25	4.50	2	6818 2.500
3.00	6.00	2.85	65	3.0	18.00	24.9	29.0	1.50	3.60	2	6818 3.000
4.00	6.00	3.80	65	4.0	24.00	27.0	29.0	2.00	2.30	2	6818 4.000
5.00	6.00	4.80	80	5.0	30.00	31.6	44.0	2.50	0.90	2	6818 5.000
6.00	6.00	5.70	80	6.0	30.00	30.6	44.0	3.00		2	6818 6.000
8.00	8.00	7.70	90	8.0	40.00	40.6	54.0	4.00		2	6818 8.000
10.00	10.00	9.50	100	10.0	50.00	50.9	60.0	5.00		2	6818 10.000
12.00	12.00	11.50	120	12.0	60.00	60.9	75.0	6.00		2	6818 12.000

Ball nose end mills G-Mold µ 65 B



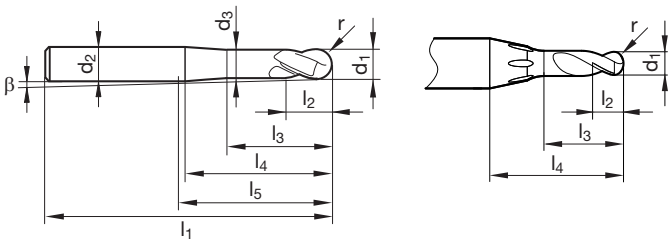
Tool material	**Solid carbide**
Surface	X
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = 0.5 x d1 ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.2-3 mm
- centre cutting
- neck clearance

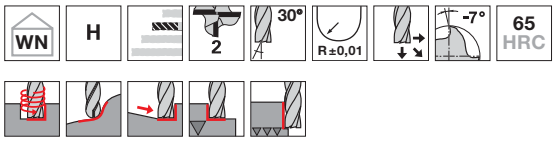




Article no. **6819**

$d1^{-0,005}_{-0,015}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.20	4.00	0.18	50	0.2	1.5	10.2	22.0	0.10	10.60	2	6819 0.200
0.30	4.00	0.28	50	0.3	3.0	11.4	22.0	0.15	9.30	2	6819 0.300
0.40	4.00	0.38	50	0.4	4.0	12.1	22.0	0.20	8.60	2	6819 0.400
0.50	4.00	0.45	50	0.5	5.0	13.0	22.0	0.25	7.80	2	6819 0.500
0.60	4.00	0.55	50	0.6	6.0	13.7	22.0	0.30	7.20	2	6819 0.600
0.80	4.00	0.75	50	0.8	8.0	15.1	22.0	0.40	6.20	2	6819 0.800
1.00	4.00	0.92	50	1.0	10.0	16.7	22.0	0.50	5.30	2	6819 1.000
1.20	4.00	1.12	55	1.2	12.0	18.3	27.0	0.60	4.50	2	6819 1.200
1.50	4.00	1.40	55	1.5	16.0	21.6	27.0	0.75	3.40	2	6819 1.500
1.80	4.00	1.70	63	1.8	20.0	24.9	35.0	0.90	2.60	2	6819 1.800
2.00	6.00	1.85	65	2.0	20.0	29.2	29.0	1.00	4.00	2	6819 2.000
2.50	6.00	2.35	65	2.5	20.0	28.1	29.0	1.25	3.70	2	6819 2.500
3.00	6.00	2.85	70	3.0	25.0	31.9	34.0	1.50	2.80	2	6819 3.000
4.00	6.00	3.80	75	4.0	32.0	35.0	39.0	2.00	1.70	2	6819 4.000
5.00	6.00	4.80	80	5.0	42.0	43.6	44.0	2.50	0.70	2	6819 5.000
6.00	6.00	5.70	100	6.0	40.0	40.6	64.0	3.00		2	6819 6.000
8.00	8.00	7.70	100	8.0	40.0	40.6	64.0	4.00		2	6819 8.000

Ball nose end mills G-Mold 65 B



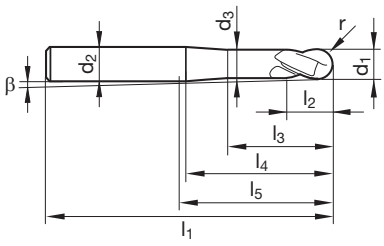
Tool material	**Solid carbide**
Surface	TiCN
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- neck clearance
- centre cutting

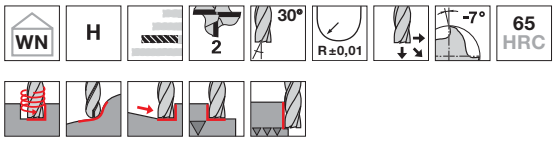




Article no.	**6832**

$d1^{-0,01}_{-0,03}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	45	0.5	2.5	9.1	17.0	0.25	10.80	2	6832 0.500
0.80	4.00	0.75	45	0.8	3.2	9.3	17.0	0.40	9.70	2	6832 0.800
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.50	8.70	2	6832 1.000
1.50	4.00	1.40	45	1.5	6.0	10.9	17.0	0.75	6.50	2	6832 1.500
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	1.00	8.30	2	6832 2.000
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	1.50	5.20	2	6832 3.000
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	2.00	3.30	2	6832 4.000
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	2.50	1.50	2	6832 5.000
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	3.00		2	6832 6.000
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	4.00		2	6832 8.000
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	5.00		2	6832 10.000
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	6.00		2	6832 12.000

Ball nose end mills G-Mold 65 B



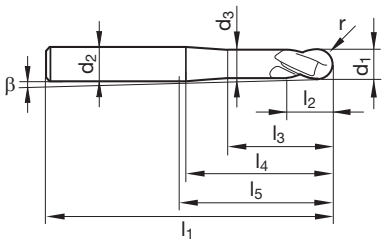
Tool material	**Solid carbide**
Surface	TiAlN
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- neck clearance
- centre cutting

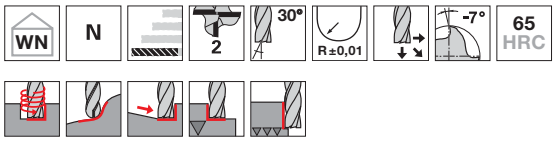




Article no.	**6833**

$d1^{-0,01}_{-0,03}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	50	0.5	3.6	10.2	22.0	0.25	9.70	2	6833 0.500
0.80	4.00	0.75	50	0.8	5.0	11.1	22.0	0.40	8.20	2	6833 0.800
1.00	4.00	0.92	50	1.0	6.5	12.2	22.0	0.50	7.00	2	6833 1.000
1.50	4.00	1.40	50	1.5	10.0	14.9	22.0	0.75	4.80	2	6833 1.500
2.00	6.00	1.85	57	2.0	13.0	18.7	21.0	1.00	6.10	2	6833 2.000
3.00	6.00	2.85	65	3.0	20.0	24.3	29.0	1.50	3.50	2	6833 3.000
4.00	6.00	3.80	75	4.0	25.0	28.0	39.0	2.00	2.00	2	6833 4.000
5.00	6.00	4.80	75	5.0	31.0	32.6	39.0	2.50	0.80	2	6833 5.000
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	3.00		2	6833 6.000
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	4.00		2	6833 8.000
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	5.00		2	6833 10.000
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	6.00		2	6833 12.000

Ball nose end mills G-Mold 65 B



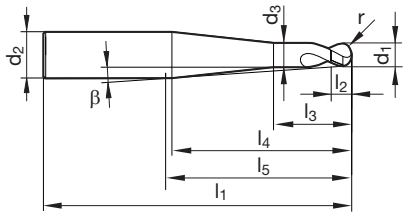
Tool material	**Solid carbide**
Surface	TiAlN
Type	N
Shank form	HA

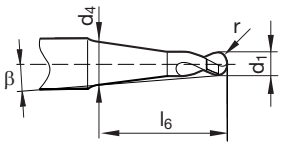
P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- neck clearance
- centre cutting



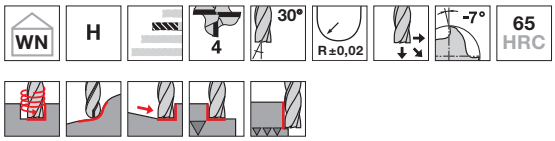




Article no.	**6834**

$d1^{-0,01}_{-0,03}$	d2 h5	d3	d4	l1	l2	l3	l4	l5	l6	r	β	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	1.47	50	0.5	1.3	14.7	22.0	10.0	0.25	3.00	2	6834 0.500
0.80	4.00	0.75	2.38	50	0.8	2.0	19.0	22.0	16.0	0.40	3.00	2	6834 0.800
1.00	4.00	0.92	2.99	63	1.0	2.5	21.9	35.0	20.0	0.50	3.00	2	6834 1.000
1.50	4.00	1.40		63	1.5	3.8	25.6	35.0		0.75	3.00	2	6834 1.500
2.00	6.00	1.85		80	2.0	5.0	40.1	44.0		1.00	3.00	2	6834 2.000
3.00	6.00	2.85		80	3.0	7.5	31.1	44.0		1.50	3.00	2	6834 3.000
4.00	6.00	3.80		80	4.0	10.0	22.0	44.0		2.00	3.00	2	6834 4.000
5.00	8.00	4.80		90	5.0	12.5	32.1	54.0		2.50	3.00	2	6834 5.000
6.00	8.00	5.70		90	6.0	15.0	43.1	54.0		3.00	1.50	2	6834 6.000
8.00	10.00	7.70		100	8.0	20.0	44.1	60.0		4.00	1.50	2	6834 8.000
10.00	12.00	9.50		120	10.0	25.0	45.1	75.0		5.00	1.50	2	6834 10.000

Ball nose end mills G-Mold 65 B



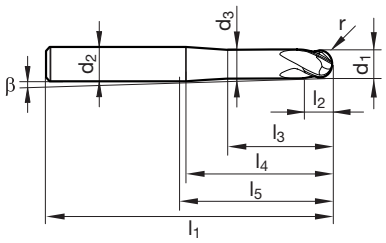
Tool material	**Solid carbide**
Surface	TiAlN
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- 4 face cutting edges up to the centre
- neck clearance
- centre cutting

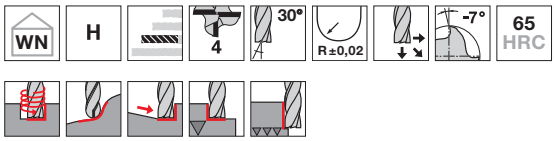




Article no. **6835**

$d1^{-0,01}_{-0,03}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.50	8.70	4	6835 1.000
1.50	4.00	1.40	45	1.5	6.0	10.9	17.0	0.75	6.50	4	6835 1.500
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	1.00	8.30	4	6835 2.000
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	1.50	5.20	4	6835 3.000
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	2.00	3.30	4	6835 4.000
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	2.50	1.50	4	6835 5.000
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	3.00		4	6835 6.000
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	4.00		4	6835 8.000
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	5.00		4	6835 10.000
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	6.00		4	6835 12.000

Ball nose end mills G-Mold 65 B



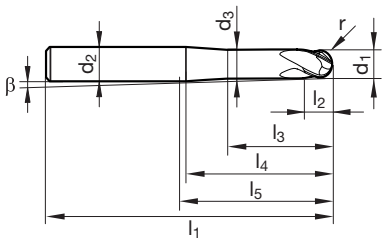
Tool material	**Solid carbide**
Surface	TiAlN
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- 4 face cutting edges up to the centre
- neck clearance
- centre cutting

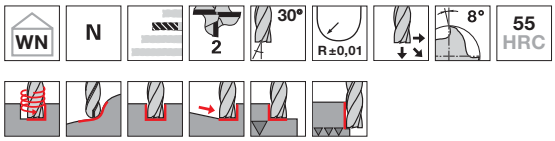




Article no. **6836**

$d1^{-0,01}_{-0,03}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	50	1.0	6.5	12.2	25.0	0.50	7.00	4	6836 1.000
1.50	4.00	1.40	50	1.5	10.0	14.9	25.5	0.75	4.80	4	6836 1.500
2.00	6.00	1.85	57	2.0	13.0	18.7	29.5	1.00	6.10	4	6836 2.000
3.00	6.00	2.85	65	3.0	20.0	24.3	34.5	1.50	3.50	4	6836 3.000
4.00	6.00	3.80	75	4.0	25.0	28.0	40.6	2.00	2.00	4	6836 4.000
5.00	6.00	4.80	75	5.0	31.0	32.6	41.6	2.50	0.80	4	6836 5.000
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	3.00		4	6836 6.000
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	4.00		4	6836 8.000
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	5.00		4	6836 10.000
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	6.00		4	6836 12.000

Ball nose end mills G-Mold 55 B



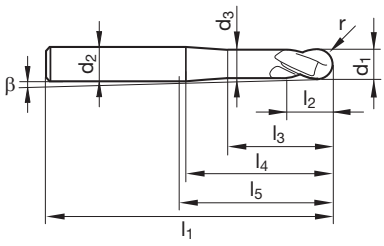
Tool material	**Solid carbide**
Surface	TiAlN
Type	N
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- neck clearance
- centre cutting

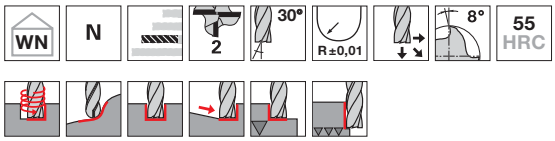




Article no.	**6844**

$d1^{-0,01}_{-0,03}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	45	0.5	2.5	9.1	17.0	0.25	10.80	2	6844 0.500
0.80	4.00	0.75	45	0.8	3.2	9.3	17.0	0.40	9.70	2	6844 0.800
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.50	8.70	2	6844 1.000
1.50	4.00	1.40	45	1.5	6.0	10.9	17.0	0.75	6.50	2	6844 1.500
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	1.00	8.30	2	6844 2.000
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	1.50	5.20	2	6844 3.000
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	2.00	3.30	2	6844 4.000
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	2.50	1.50	2	6844 5.000
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	3.00		2	6844 6.000
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	4.00		2	6844 8.000
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	5.00		2	6844 10.000
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	6.00		2	6844 12.000

Ball nose end mills G-Mold 55 B



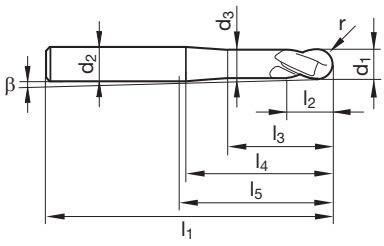
Tool material	**Solid carbide**
Surface	TiCN
Type	N
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- neck clearance
- centre cutting

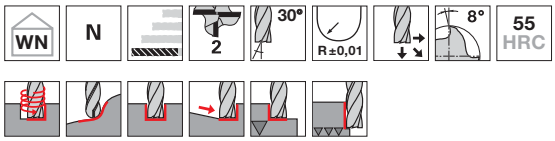




Article no.	**6845**

$d1^{-0,01}_{-0,03}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	50	0.5	3.6	10.2	22.0	0.25	9.70	2	6845 0.500
0.80	4.00	0.75	50	0.8	5.0	11.1	22.0	0.40	8.20	2	6845 0.800
1.00	4.00	0.92	50	1.0	6.5	12.2	22.0	0.50	7.00	2	6845 1.000
1.50	4.00	1.40	50	1.5	10.0	14.9	22.0	0.75	4.80	2	6845 1.500
2.00	6.00	1.85	57	2.0	13.0	18.7	21.0	1.00	6.10	2	6845 2.000
3.00	6.00	2.85	65	3.0	20.0	24.3	29.0	1.50	3.50	2	6845 3.000
4.00	6.00	3.80	75	4.0	25.0	28.0	39.0	2.00	2.00	2	6845 4.000
5.00	6.00	4.80	75	5.0	31.0	32.6	39.0	2.50	0.80	2	6845 5.000
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	3.00		2	6845 6.000
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	4.00		2	6845 8.000
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	5.00		2	6845 10.000
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	6.00		2	6845 12.000

Ball nose end mills G-Mold 55 B



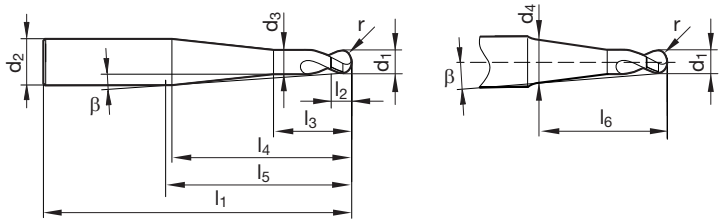
Tool material	**Solid carbide**
Surface	TiAlN
Type	N
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- neck clearance
- centre cutting





Article no. **6846**

d1 -0,01 -0,03	d2 h5	d3	d4	l1	l2	l3	l4	l5	l6	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	0.96	50	0.5	1.3	15.7	22.0	10.0	0.25	1.50	2	6846 0.500
0.80	4.00	0.75	1.56	50	0.8	2.0	20.5	22.0	16.0	0.40	1.50	2	6846 0.800
1.00	4.00	0.92	1.97	63	1.0	2.5	23.8	35.0	20.0	0.50	1.50	2	6846 1.000
1.50	4.00	1.40	2.98	63	1.5	3.8	31.9	35.0	30.0	0.75	1.50	2	6846 1.500
2.00	6.00	1.85	3.99	80	2.0	5.0	43.7	44.0	40.0	1.00	1.50	2	6846 2.000
3.00	6.00	2.85	4.96	80	3.0	7.5	41.9	44.0	40.0	1.50	1.50	2	6846 3.000
4.00	6.00	3.80		80	4.0	10.0	42.1	44.0		2.00	1.50	2	6846 4.000
5.00	8.00	4.80	6.91	90	5.0	12.5	42.0	54.0	40.0	2.50	1.50	2	6846 5.000
6.00	8.00	5.70		90	6.0	15.0	43.1	54.0		3.00	1.50	2	6846 6.000
8.00	10.00	7.70		100	8.0	20.0	44.1	60.0		4.00	1.50	2	6846 8.000
10.00	12.00	9.50		120	10.0	25.0	45.1	75.0		5.00	1.50	2	6846 10.000

Ball nose end mills G-Mold 55 B

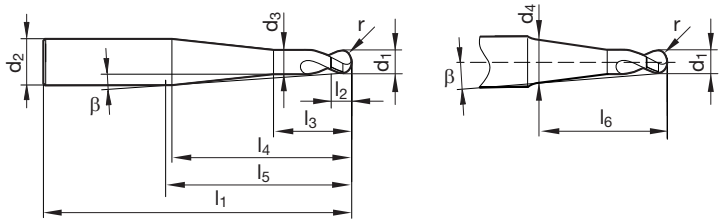
Tool material	**Solid carbide**
Surface	
Type	N
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- neck clearance
- centre cutting

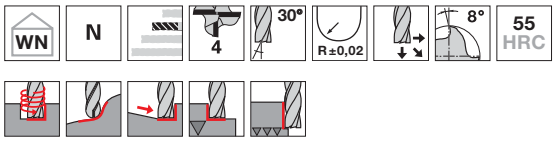




Article no. **6847**

d1 -0,01 -0,03	d2 h5	d3	d4	l1	l2	l3	l4	l5	l6	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	0.79	50	0.5	1.3	16.0	22.0	10.0	0.25	1.00	2	6847 0.500
0.80	4.00	0.75	1.29	50	0.8	2.0	21.0	22.0	16.0	0.40	1.00	2	6847 0.800
1.00	4.00	0.92	1.63	63	1.0	2.5	24.4	35.0	20.0	0.50	1.00	2	6847 1.000
1.50	4.00	1.40	2.47	63	1.5	3.8	32.8	35.0	30.0	0.75	1.00	2	6847 1.500
2.00	6.00	1.85	3.31	80	2.0	5.0	45.0	44.0	40.0	1.00	1.00	2	6847 2.000
3.00	6.00	2.85	4.29	80	3.0	7.5	43.2	44.0	40.0	1.50	1.00	2	6847 3.000
4.00	6.00	3.80	5.28	80	4.0	10.0	41.3	44.0	40.0	2.00	1.00	2	6847 4.000
5.00	8.00	4.80	6.61	90	5.0	12.5	52.6	54.0	50.0	2.50	1.00	2	6847 5.000
6.00	8.00	5.70	7.59	90	6.0	15.0	50.8	54.0	50.0	3.00	1.00	2	6847 6.000
8.00	10.00	7.70		100	8.0	20.0	64.2	60.0		4.00	1.00	2	6847 8.000

Ball nose end mills G-Mold 55 B



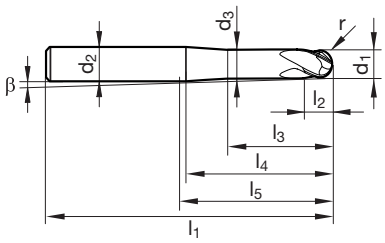
Tool material	**Solid carbide**
Surface	TiAlN
Type	N
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

NEW

- 4 face cutting edges up to the centre
- neck clearance
- centre cutting

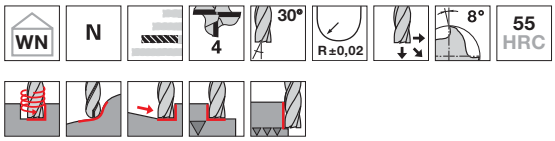




Article no. **6848**

$d1^{-0,01}_{-0,03}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.50	8.70	4	6848 1.000
1.50	4.00	1.40	45	1.5	6.0	10.9	17.0	0.75	6.50	4	6848 1.500
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	1.00	8.30	4	6848 2.000
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	1.50	5.20	4	6848 3.000
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	2.00	3.30	4	6848 4.000
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	2.50	1.50	4	6848 5.000
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	3.00		4	6848 6.000
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	4.00		4	6848 8.000
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	5.00		4	6848 10.000
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	6.00		4	6848 12.000

Ball nose end mills G-Mold 55 B



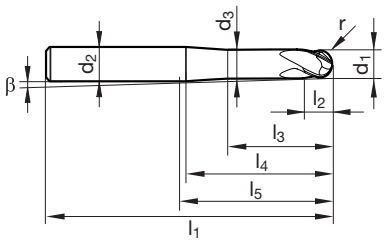
	Tool material	Solid carbide
	Surface	Y
	Type	N
	Shank form	HA

NEW

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

- 4 face cutting edges up to the centre
- neck clearance
- centre cutting

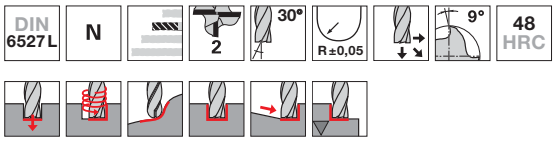




	Article no.	6849

$d1^{-0,01}_{-0,03}$	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	50	1.0	6.5	12.2	25.0	0.50	7.00	4	6849 1.000
1.50	4.00	1.40	50	1.5	10.0	14.9	25.5	0.75	4.80	4	6849 1.500
2.00	6.00	1.85	57	2.0	13.0	18.7	29.5	1.00	6.10	4	6849 2.000
3.00	6.00	2.85	65	3.0	20.0	24.3	34.5	1.50	3.50	4	6849 3.000
4.00	6.00	3.80	75	4.0	25.0	28.0	40.5	2.00	2.00	4	6849 4.000
5.00	6.00	4.80	75	5.0	31.0	32.6	41.5	2.50	0.80	4	6849 5.000
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	3.00		4	6849 6.000
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	4.00		4	6849 8.000
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	5.00		4	6849 10.000
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	6.00		4	6849 12.000

Ball nose slot drills (2-fluted)

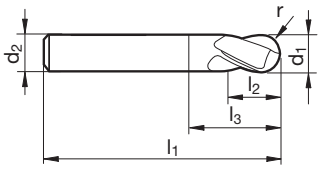


Tool material	Solid carbide	
Surface	F	F
Type	N	N
Shank form	HA	HB

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 153

• centre cutting

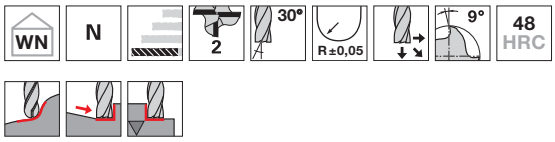




Article no.	3679	3049

d1 h10	d2 h6	l1	l2	l3	l4	r	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm			
0.50	3.00	38	1.0	2.1	10.0	0.250	2	3679 0.500	
0.80	3.00	38	1.0	2.1	10.0	0.400	2	3679 0.800	
1.00	3.00	38	2.0	3.9	10.0	0.500	2	3679 1.000	
1.50	3.00	38	3.0	6.4	10.0	0.750	2	3679 1.500	
2.00	6.00	57	6.0	9.4	21.0	1.000	2	3679 2.000	3049 2.000
3.00	6.00	57	7.0	11.9	21.0	1.500	2	3679 3.000	3049 3.000
4.00	6.00	57	8.0	13.4	21.0	2.000	2	3679 4.000	3049 4.000
5.00	6.00	57	10.0	16.9	21.0	2.500	2	3679 5.000	3049 5.000
6.00	6.00	57	10.0	21.0	21.0	3.000	2	3679 6.000	3049 6.000
8.00	8.00	63	16.0	27.0	27.0	4.000	2	3679 8.000	3049 8.000
10.00	10.00	72	19.0	32.0	32.0	5.000	2	3679 10.000	3049 10.000
12.00	12.00	83	22.0	38.0	38.0	6.000	2	3679 12.000	3049 12.000
14.00	14.00	83	22.0	38.0	38.0	7.000	2	3679 14.000	3049 14.000
16.00	16.00	92	26.0	44.0	44.0	8.000	2	3679 16.000	3049 16.000
18.00	18.00	92	26.0	44.0	44.0	9.000	2	3679 18.000	3049 18.000
18.00	20.00	104	32.0	51.0	54.0	9.000	2	3679 18.001	
20.00	20.00	104	32.0	54.0	54.0	10.000	2	3679 20.000	3049 20.000

XL ball nose slot drills (2-fluted)

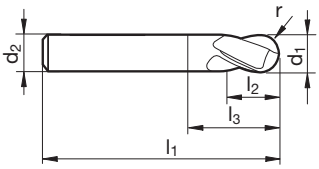


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	HA

P	•
M	•
K	
N	•
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 153

• centre cutting

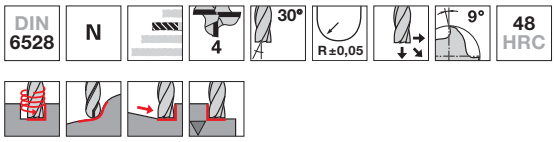




Article no. **3030**

d1 h10	d2 h6	l1	l2	l3	l4	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
3.00	3.00	75	20.0	47.0	47.0	1.500	2	3030 3.000
4.00	4.00	75	25.0	47.0	47.0	2.000	2	3030 4.000
5.00	5.00	75	30.0	47.0	47.0	2.500	2	3030 5.000
6.00	6.00	75	30.0	39.0	39.0	3.000	2	3030 6.000
8.00	8.00	100	40.0	64.0	64.0	4.000	2	3030 8.000
10.00	10.00	100	40.0	60.0	60.0	5.000	2	3030 10.000
12.00	12.00	150	45.0	105.0	105.0	6.000	2	3030 12.000

Ball nose end mills (4-fluted)



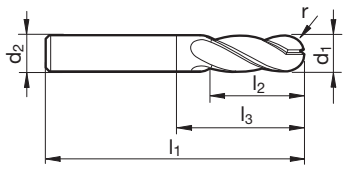
Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	HA

P	•
M	○
K	•
N	○
S	•
H	○

GÜHRINGNAVIGATOR

Cutting data page 153

- 4 face cutting edges up to the centre
- centre cutting

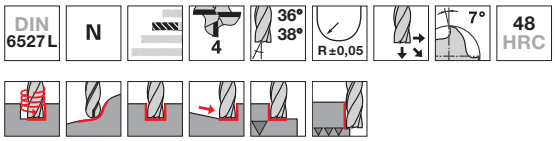




Article no. **3727**

d1 h10	d2 h6	l1	l2	l3	l4	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
4.00	4.00	50	11.0	22.0	22.0	2.000	4	3727 4.000
5.00	5.00	50	13.0	22.0	22.0	2.500	4	3727 5.000
6.00	6.00	57	13.0	21.0	21.0	3.000	4	3727 6.000
8.00	8.00	63	19.0	27.0	27.0	4.000	4	3727 8.000
10.00	10.00	72	22.0	32.0	32.0	5.000	4	3727 10.000
12.00	12.00	83	26.0	38.0	38.0	6.000	4	3727 12.000
14.00	14.00	83	26.0	38.0	38.0	7.000	4	3727 14.000
14.00	16.00	92	32.0	36.0	44.0	7.000	4	3727 14.001
16.00	16.00	92	32.0	44.0	44.0	8.000	4	3727 16.000
18.00	18.00	92	32.0	44.0	44.0	9.000	4	3727 18.000
18.00	20.00	104	38.0	44.0	54.0	9.000	4	3727 18.001
20.00	20.00	104	38.0	54.0	54.0	10.000	4	3727 20.000

Ratio end mills RF 100 VA

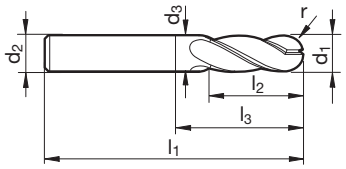


Tool material	Solid carbide	
Surface	a	a
Type	N	N
Shank form	HA	HB

P	•
M	•
K	○
N	•
S	•
H	○

GÜHRING NAVIGATOR
Cutting data page 157

- 4 face cutting edges up to the centre
- neck clearance
- centre cutting



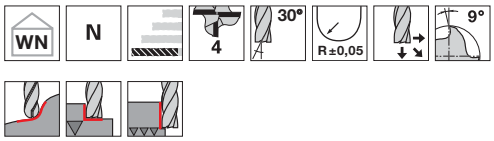




Article no.	6707	6708

d1 h10	d2 h6	d3	l1	l2	l3	r	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm			
4.00	6.00	3.80	57	11.0	18.0	2.0	4	6707 4.000	6708 4.000
5.00	6.00	4.80	57	13.0	18.0	2.5	4	6707 5.000	6708 5.000
6.00	6.00	5.70	57	13.0	20.0	3.0	4	6707 6.000	6708 6.000
8.00	8.00	7.70	63	19.0	26.0	4.0	4	6707 8.000	6708 8.000
10.00	10.00	9.50	72	22.0	30.0	5.0	4	6707 10.000	6708 10.000
12.00	12.00	11.50	83	26.0	36.0	6.0	4	6707 12.000	6708 12.000
16.00	16.00	15.50	92	32.0	42.0	8.0	4	6707 16.000	6708 16.000
20.00	20.00	19.50	104	38.0	52.0	10.0	4	6707 20.000	6708 20.000
25.00	25.00	24.00	121	45.0	63.0	12.5	4	6707 25.000	6708 25.000

XL ball nose end mills (4-fluted)

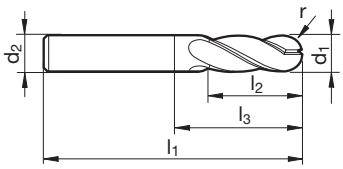


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	HA

P	•
M	•
K	○
N	○
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 153

- 4 face cutting edges up to the centre
- centre cutting

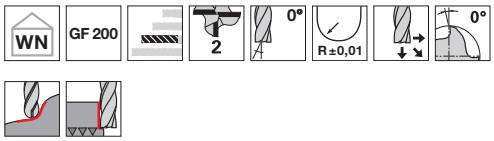




Article no. **3043**

d1 h10	d2 h6	l1	l2	l3	l4	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
3.00	3.00	75.00	20	47.0	47.0	1.50	4	3043 3.000
4.00	4.00	75.00	25	47.0	47.0	2.00	4	3043 4.000
5.00	5.00	75.00	30	47.0	47.0	2.50	4	3043 5.000
6.00	6.00	75.00	30	39.0	39.0	3.00	4	3043 6.000
8.00	8.00	100.00	40	64.0	64.0	4.00	4	3043 8.000
10.00	10.00	100.00	40	60.0	60.0	5.00	4	3043 10.000
12.00	12.00	150.00	45	105.0	105.0	6.00	4	3043 12.000

Die sinking cutter holders GF 200 WP

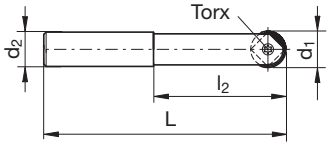


Surface	Ni
Type	GF 200
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

• to be used with indexable inserts art. no.: 1947/2520

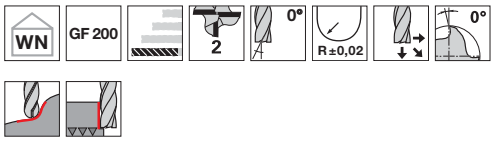




Article no. **1941**

d1 ±0,015	d2 h6	l1	l2	Torx	Order no.
mm	mm	mm	mm		
10.00	10.00	95	45	T8	1941 10.000
12.00	12.00	110	50	T15	1941 12.000
16.00	16.00	125	65	T20	1941 16.000
20.00	20.00	140	75	T20	1941 20.000
25.00	25.00	165	90	T30	1941 25.000
32.00	32.00	185	105	T30	1941 32.000

Die sinking cutter holders GF 200 WP

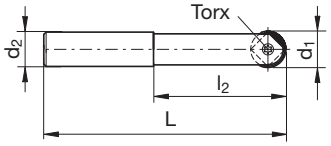


Surface	Ni
Type	GF 200
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

• to be used with indexable inserts art. no.: 1947/2520

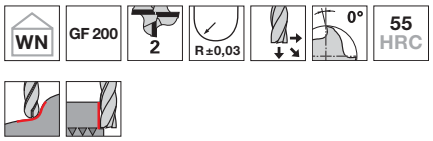




Article no. **1942**

d1 ±0,015	d2 h6	l1	l2	Torx	Order no.
mm	mm	mm	mm		
10.00	12.00	150	35	T8	1942 10.000
12.00	16.00	160	60	T15	1942 12.000
16.00	20.00	174	70	T20	1942 16.000
20.00	25.00	189	80	T20	1942 20.000
25.00	32.00	210	100	T30	1942 25.000

Indexable inserts round

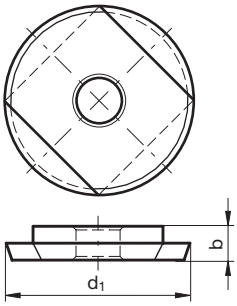


	Tool material	Cermet	Solid carbide
	Surface	○	F

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 150

for GF 200 WP • applicable twice







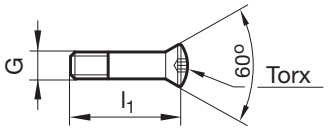
Article no.	1947	2520

d1 ±0,015	b	Order no.	
mm	mm		
20.00	4.0	1947 20.000	2520 20.000
10.00	2.5	1947 10.000	2520 10.000
12.00	2.5	1947 12.000	2520 12.000
16.00	3.2	1947 16.000	2520 16.000
25.00	4.6	1947 25.000	2520 25.000
32.00	5.0		2520 32.000

Clamping screws for die sinking cutter holders

WN

for GF 200 WP



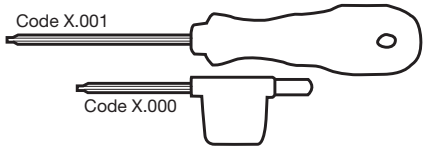


	Article no.	**1691**

G	Torx	l1	**Order no.**
		mm	
M 4 X0.5	T15	10.200	1691 4.000
M 5 X0.5	T20	12.800	1691 5.000
M 5 X0.5	T20	15.400	1691 5.001
M 3	T8	8.500	1691 3.000
M 8 X0.75	T30	24.800	1691 8.000
M12 X 1.5	T30	20.400	1691 6.000

Torx screwdrivers

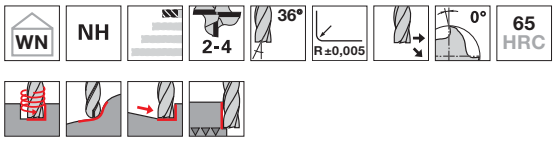
WN





	Article no.	1612
Torx		Order no.
T5		1612 5.001
T6		1612 6.000
T7		1612 7.000
T8		1612 8.000
T9		1612 9.001
T10		1612 10.000
T15		1612 15.000
T20		1612 20.001
SW 5		1612 25.000
T25		1612 25.001
T30		1612 30.001

Torus end mills G-Mold µ 65 T



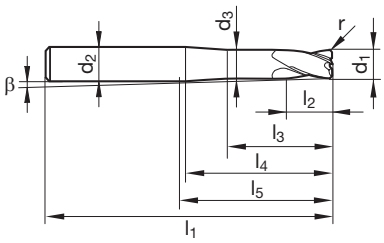
Tool material	**Solid carbide**
Surface	X
Type	NH
Shank form	HA

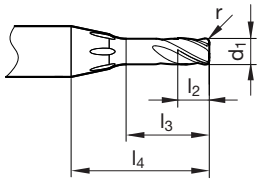
P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 151

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.3-3 mm
- centre cutting
- neck clearance





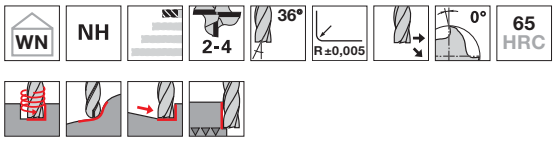




Article no. **6820**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.30	4.00	0.28	50	0.3	0.75	9.1	22,0	0.05	11.50	2	6820 0.300
0.50	4.00	0.45	50	0.5	1.25	9.2	22,0	0.05	10.80	2	6820 0.500
0.50	4.00	0.45	50	0.5	1.25	9.2	22,0	0.10	10.80	2	6820 0.501
0.60	4.00	0.55	50	0.6	1.50	9.2	22,0	0.05	10.50	2	6820 0.600
0.60	4.00	0.55	50	0.6	1.50	9.2	22,0	0.10	10.50	2	6820 0.601
0.80	4.00	0.75	50	0.8	2.00	9.1	22,0	0.05	10.00	2	6820 0.800
0.80	4.00	0.75	50	0.8	2.00	9.1	22,0	0.10	10.00	2	6820 0.801
0.80	4.00	0.75	50	0.8	2.00	9.1	22,0	0.20	10.20	2	6820 0.802
1.00	4.00	0.92	50	1.0	2.50	9.2	22,0	0.10	9.30	2	6820 1.001
1.00	4.00	0.92	50	1.0	2.50	9.2	22,0	0.20	9.40	2	6820 1.002
1.00	4.00	0.92	50	1.0	2.50	9.2	22,0	0.30	9.50	2	6820 1.003
1.50	4.00	1.40	50	1.5	4.00	9.6	27,0	0.10	7.50	2	6820 1.501
1.50	4.00	1.40	50	1.5	4.00	9.6	27,0	0.20	7.50	2	6820 1.502
1.50	4.00	1.40	50	1.5	4.00	9.6	27,0	0.50	7.80	2	6820 1.505
2.00	6.00	1.85	50	2.0	5.00	14.2	29,0	0.20	8.10	2	6820 2.002
2.00	6.00	1.85	50	2.0	5.00	14.2	29,0	0.50	8.30	2	6820 2.005
2.50	6.00	2.35	50	2.5	6.00	14.1	29,0	0.20	7.10	2	6820 2.502
2.50	6.00	2.35	50	2.5	6.00	14.1	29,0	0.50	7.30	2	6820 2.505
3.00	6.00	2.85	50	3.0	8.00	14.9	34,0	0.20	5.80	2	6820 3.002
3.00	6.00	2.85	50	3.0	8.00	14.9	34,0	0.30	5.80	2	6820 3.003
3.00	6.00	2.85	50	3.0	8.00	14.9	34,0	0.50	5.90	2	6820 3.005
4.00	6.00	3.80	50	4.0	10.00	13.0	39.0	0.20	4.40	4	6820 4.002
4.00	6.00	3.80	50	4.0	10.00	13.0	39.0	0.50	4.50	4	6820 4.005
4.00	6.00	3.80	50	4.0	10.00	13.0	39.0	1.00	4.70	4	6820 4.010
5.00	6.00	4.80	50	5.0	12.50	14.1	44.0	0.50	2.10	4	6820 5.005
6.00	6.00	5.70	54	6.0	15.00	15.6	64.0	0.20		4	6820 6.002
6.00	6.00	5.70	54	6.0	15.00	15.6	64.0	0.50		4	6820 6.005
6.00	6.00	5.70	54	6.0	15.00	15.6	64.0	1.00		4	6820 6.010
8.00	8.00	7.70	58	8.0	20.00	20.6	64.0	0.50		4	6820 8.005
8.00	8.00	7.70	58	8.0	20.00	20.6	64.0	0.80		4	6820 8.008
8.00	8.00	7.70	58	8.0	20.00	20.6	64.0	1.00		4	6820 8.010
10.00	10.00	9.50	72	10.0	25.00	25.9	32.0	0.50		4	6820 10.005
10.00	10.00	9.50	72	10.0	25.00	25.9	32.0	1.00		4	6820 10.010
10.00	10.00	9.50	72	10.0	25.00	25.9	32.0	2.00		4	6820 10.020
12.00	12.00	11.50	73	12.0	30.00	30.9	28.0	0.50		4	6820 12.005
12.00	12.00	11.50	73	12.0	30.00	30.9	28.0	1.00		4	6820 12.010
12.00	12.00	11.50	73	12.0	30.00	30.9	28.0	2.00		4	6820 12.020

Torus end mills G-Mold µ 65 T



Tool material	Solid carbide
Surface	X
Type	NH
Shank form	HA

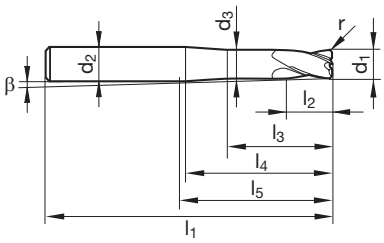
P	○
M	
K	•
N	
S	
H	•

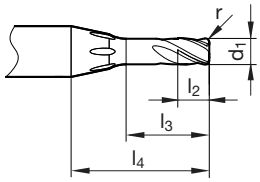
GÜHRINGNAVIGATOR

Cutting data page 151

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.3-3 mm
- centre cutting
- neck clearance



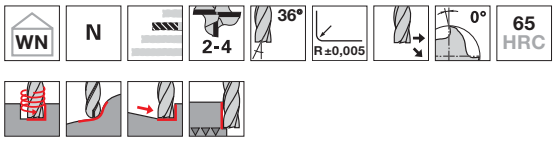




Article no. **6821**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.30	4.00	0.28	50	0.3	1.0	9.4	22,0	0.05	11.20	2	6821 0.300
0.50	4.00	0.45	50	0.5	1.5	9.5	22,0	0.05	10.50	2	6821 0.500
0.50	4.00	0.45	50	0.5	1.5	9.5	22,0	0.10	10.50	2	6821 0.501
0.60	4.00	0.55	50	0.6	2.0	9.7	22,0	0.05	10.00	2	6821 0.600
0.60	4.00	0.55	50	0.6	2.0	9.7	22,0	0.10	10.00	2	6821 0.601
0.80	4.00	0.75	50	0.8	3.0	10.1	22,0	0.05	9.00	2	6821 0.800
0.80	4.00	0.75	50	0.8	3.0	10.1	22,0	0.10	9.10	2	6821 0.801
0.80	4.00	0.75	50	0.8	3.0	10.1	22,0	0.20	9.10	2	6821 0.802
1.00	4.00	0.92	50	1.0	3.0	9.7	22,0	0.10	8.80	2	6821 1.001
1.00	4.00	0.92	50	1.0	3.0	9.7	22,0	0.20	8.90	2	6821 1.002
1.00	4.00	0.92	50	1.0	3.0	9.7	22,0	0.30	9.00	2	6821 1.003
1.50	4.00	1.40	50	1.5	6.0	11.6	27,0	0.10	6.20	2	6821 1.501
1.50	4.00	1.40	50	1.5	6.0	11.6	27,0	0.20	6.20	2	6821 1.502
1.50	4.00	1.40	50	1.5	6.0	11.6	27,0	0.50	6.40	2	6821 1.505
2.00	6.00	1.85	50	2.0	6.0	15.2	29,0	0.20	7.60	2	6821 2.002
2.00	6.00	1.85	50	2.0	6.0	15.2	29,0	0.50	7.70	2	6821 2.005
2.50	6.00	2.35	50	2.5	8.0	16.1	29,0	0.20	6.20	2	6821 2.502
2.50	6.00	2.35	50	2.5	8.0	16.1	29,0	0.50	6.40	2	6821 2.505
3.00	6.00	2.85	57	3.0	10.0	16.9	34,0	0.20	5.10	2	6821 3.002
3.00	6.00	2.85	57	3.0	10.0	16.9	34,0	0.30	5.10	2	6821 3.003
3.00	6.00	2.85	57	3.0	10.0	16.9	34,0	0.50	5.20	2	6821 3.005
4.00	6.00	3.80	57	4.0	14.0	17.0	39.0	0.20	3.40	4	6821 4.002
4.00	6.00	3.80	57	4.0	14.0	17.0	39.0	0.50	3.40	4	6821 4.005
4.00	6.00	3.80	57	4.0	14.0	17.0	39.0	1.00	3.50	4	6821 4.010
5.00	6.00	4.80	57	5.0	18.0	19.6	44.0	0.50	1.50	4	6821 5.005
6.00	6.00	5.70	57	6.0	20.0	20.6	64.0	0.20		4	6821 6.002
6.00	6.00	5.70	57	6.0	20.0	20.6	64.0	0.50		4	6821 6.005
6.00	6.00	5.70	57	6.0	20.0	20.6	64.0	1.00		4	6821 6.010
8.00	8.00	7.70	63	8.0	26.0	26.6	64.0	0.50		4	6821 8.005
8.00	8.00	7.70	63	8.0	26.0	26.6	64.0	0.80		4	6821 8.008
8.00	8.00	7.70	63	8.0	26.0	26.6	64.0	1.00		4	6821 8.010
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	0.50		4	6821 10.005
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	1.00		4	6821 10.010
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	2.00		4	6821 10.020
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	0.50		4	6821 12.005
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	1.00		4	6821 12.010
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	2.00		4	6821 12.020

Torus end mills G-Mold µ 65 T



Tool material	**Solid carbide**
Surface	X
Type	N
Shank form	HA

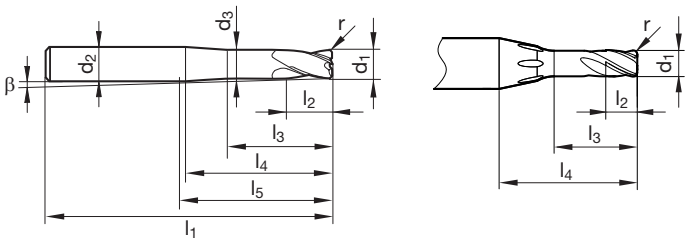
P	○
M	
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GÜHRINGNAVIGATOR

Cutting data page 151

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.3-3 mm
- centre cutting
- neck clearance

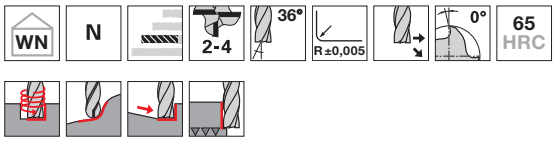




Article no.	**6822**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.30	4.00	0.28	50	0.3	1.5	9.9	22,0	0.05	10.60	2	6822 0.300
0.50	4.00	0.45	50	0.5	2.5	10.5	22,0	0.05	9.50	2	6822 0.500
0.50	4.00	0.45	50	0.5	2.5	10.5	22,0	0.10	9.50	2	6822 0.501
0.60	4.00	0.55	50	0.6	3.0	10.7	22,0	0.05	9.00	2	6822 0.600
0.60	4.00	0.55	50	0.6	3.0	10.7	22,0	0.10	9.10	2	6822 0.601
0.80	4.00	0.75	50	0.8	4.0	11.1	22,0	0.05	8.20	2	6822 0.800
0.80	4.00	0.75	50	0.8	4.0	11.1	22,0	0.10	8.20	2	6822 0.801
0.80	4.00	0.75	50	0.8	4.0	11.1	22,0	0.20	8.30	2	6822 0.802
1.00	4.00	0.92	50	1.0	5.0	11.7	22,0	0.10	7.30	2	6822 1.001
1.00	4.00	0.92	50	1.0	5.0	11.7	22,0	0.20	7.40	2	6822 1.002
1.00	4.00	0.92	50	1.0	5.0	11.7	22,0	0.30	7.50	2	6822 1.003
1.50	4.00	1.40	50	1.5	8.0	13.6	27,0	0.10	5.30	2	6822 1.501
1.50	4.00	1.40	50	1.5	8.0	13.6	27,0	0.20	5.30	2	6822 1.502
1.50	4.00	1.40	50	1.5	8.0	13.6	27,0	0.50	5.40	2	6822 1.505
2.00	6.00	1.85	50	2.0	10.0	19.2	29,0	0.20	6.00	2	6822 2.002
2.00	6.00	1.85	50	2.0	10.0	19.2	29,0	0.50	6.10	2	6822 2.005
2.50	6.00	2.35	50	2.5	12.5	20.6	29,0	0.20	4.90	2	6822 2.502
2.50	6.00	2.35	50	2.5	12.5	20.6	29,0	0.50	4.90	2	6822 2.505
3.00	6.00	2.85	65	3.0	15.0	21.9	34,0	0.20	3.90	2	6822 3.002
3.00	6.00	2.85	65	3.0	15.0	21.9	34,0	0.30	3.90	2	6822 3.003
3.00	6.00	2.85	65	3.0	15.0	21.9	34,0	0.50	4.00	2	6822 3.005
4.00	6.00	3.80	65	4.0	20.0	23.0	39.0	0.20	2.50	4	6822 4.002
4.00	6.00	3.80	65	4.0	20.0	23.0	39.0	0.50	2.50	4	6822 4.005
4.00	6.00	3.80	65	4.0	20.0	23.0	39.0	1.00	2.60	4	6822 4.010
5.00	6.00	4.80	65	5.0	25.0	26.6	44.0	0.50	1.10	4	6822 5.005
6.00	6.00	5.70	65	6.0	25.0	25.6	64.0	0.20		4	6822 6.002
6.00	6.00	5.70	65	6.0	25.0	25.6	64.0	0.50		4	6822 6.005
6.00	6.00	5.70	65	6.0	25.0	25.6	64.0	1.00		4	6822 6.010
8.00	8.00	7.70	75	8.0	30.0	30.6	64.0	0.50		4	6822 8.005
8.00	8.00	7.70	75	8.0	30.0	30.6	64.0	0.80		4	6822 8.008
8.00	8.00	7.70	75	8.0	30.0	30.6	64.0	1.00		4	6822 8.010
10.00	10.00	9.50	90	10.0	40.0	40.9	50.0	0.50		4	6822 10.005
10.00	10.00	9.50	90	10.0	40.0	40.9	50.0	1.00		4	6822 10.010
10.00	10.00	9.50	90	10.0	40.0	40.9	50.0	2.00		4	6822 10.020
12.00	12.00	11.50	100	12.0	40.0	40.9	55.0	0.50		4	6822 12.005
12.00	12.00	11.50	100	12.0	40.0	40.9	55.0	1.00		4	6822 12.010
12.00	12.00	11.50	100	12.0	40.0	40.9	55.0	2.00		4	6822 12.020

Torus end mills G-Mold µ 65 T



Tool material	Solid carbide
Surface	X
Type	N
Shank form	HA

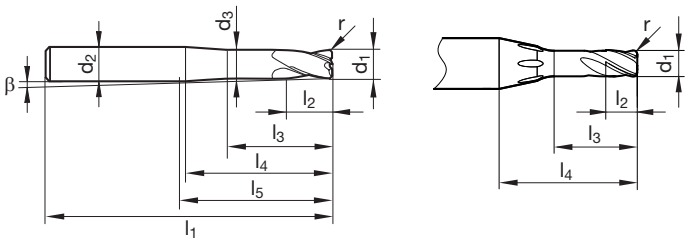
P	○
M	
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N	
S	
H	•

GÜHRINGNAVIGATOR

Cutting data page 151

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.3-3 mm
- centre cutting
- neck clearance

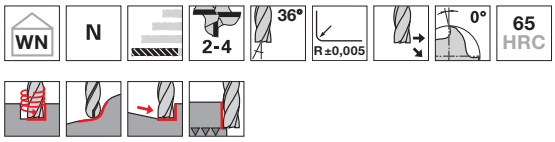




Article no.	6823

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.30	4.00	0.28	50	0.3	2.0	10.4	22,0	0.05	10.10	2	6823 0.300
0.50	4.00	0.45	50	0.5	3.0	11.0	22,0	0.05	9.00	2	6823 0.500
0.50	4.00	0.45	50	0.5	3.0	11.0	22,0	0.10	9.10	2	6823 0.501
0.60	4.00	0.55	50	0.6	4.0	11.7	22,0	0.05	8.30	2	6823 0.600
0.60	4.00	0.55	50	0.6	4.0	11.7	22,0	0.10	8.30	2	6823 0.601
0.80	4.00	0.75	50	0.8	5.0	12.1	22,0	0.05	7.50	2	6823 0.800
0.80	4.00	0.75	50	0.8	5.0	12.1	22,0	0.10	7.60	2	6823 0.801
0.80	4.00	0.75	50	0.8	5.0	12.1	22,0	0.20	7.60	2	6823 0.802
1.00	4.00	0.92	50	1.0	8.0	14.7	22,0	0.10	5.80	2	6823 1.001
1.00	4.00	0.92	50	1.0	8.0	14.7	22,0	0.20	5.90	2	6823 1.002
1.00	4.00	0.92	50	1.0	8.0	14.7	22,0	0.30	5.90	2	6823 1.003
1.50	4.00	1.40	50	1.5	10.0	15.6	27,0	0.10	4.60	2	6823 1.501
1.50	4.00	1.40	50	1.5	10.0	15.6	27,0	0.20	4.60	2	6823 1.502
1.50	4.00	1.40	50	1.5	10.0	15.6	27,0	0.50	4.70	2	6823 1.505
2.00	6.00	1.85	57	2.0	12.0	21.2	29,0	0.20	5.40	2	6823 2.002
2.00	6.00	1.85	57	2.0	12.0	21.2	29,0	0.50	5.50	2	6823 2.005
2.50	6.00	2.35	57	2.5	15.0	23.1	29,0	0.20	4.30	2	6823 2.502
2.50	6.00	2.35	57	2.5	15.0	23.1	29,0	0.50	4.40	2	6823 2.505
3.00	6.00	2.85	65	3.0	18.0	24.9	34,0	0.20	3.40	2	6823 3.002
3.00	6.00	2.85	65	3.0	18.0	24.9	34,0	0.30	3.50	2	6823 3.003
3.00	6.00	2.85	65	3.0	18.0	24.9	34,0	0.50	3.50	2	6823 3.005
4.00	6.00	3.80	65	4.0	24.0	27.0	39.0	0.20	2.10	4	6823 4.002
4.00	6.00	3.80	65	4.0	24.0	27.0	39.0	0.50	2.10	4	6823 4.005
4.00	6.00	3.80	65	4.0	24.0	27.0	39.0	1.00	2.20	4	6823 4.010
5.00	6.00	4.80	80	5.0	30.0	31.6	44.0	0.50	0.90	4	6823 5.005
6.00	6.00	5.70	80	6.0	30.0	30.6	64.0	0.20		4	6823 6.002
6.00	6.00	5.70	80	6.0	30.0	30.6	64.0	0.50		4	6823 6.005
6.00	6.00	5.70	80	6.0	30.0	30.6	64.0	1.00		4	6823 6.010
8.00	8.00	7.70	90	8.0	40.0	40.6	64.0	0.50		4	6823 8.005
8.00	8.00	7.70	90	8.0	40.0	40.6	64.0	0.80		4	6823 8.008
8.00	8.00	7.70	90	8.0	40.0	40.6	64.0	1.00		4	6823 8.010
10.00	10.00	9.50	100	10.0	50.0	50.9	60.0	0.50		4	6823 10.005
10.00	10.00	9.50	100	10.0	50.0	50.9	60.0	1.00		4	6823 10.010
10.00	10.00	9.50	100	10.0	50.0	50.9	60.0	2.00		4	6823 10.020
12.00	12.00	11.50	120	12.0	60.0	60.9	75.0	0.50		4	6823 12.005
12.00	12.00	11.50	120	12.0	60.0	60.9	75.0	1.00		4	6823 12.010
12.00	12.00	11.50	120	12.0	60.0	60.9	75.0	2.00		4	6823 12.020

Torus end mills G-Mold µ 65 T



Tool material	**Solid carbide**
Surface	X
Type	N
Shank form	HA

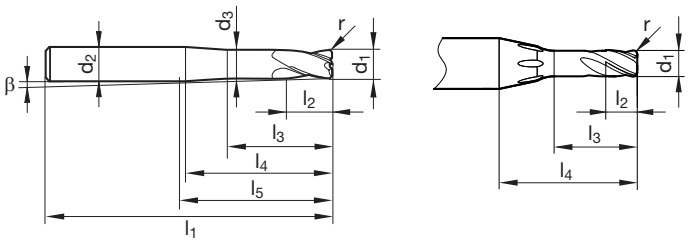
P	○
M	
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S	
H	•

GÜHRINGNAVIGATOR

Cutting data page 151

NEW

- High-precision ball nose end mills for maximum form accuracy
- exact tolerance of the radius contour r = ±0.005 mm
- Ø tolerance d1 of Ø 0.2-3 mm +0.000/-0.010 mm
- with GühroJet peripheral cooling from Ø 0.3-3 mm
- centre cutting
- neck clearance

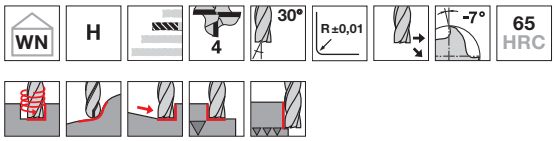




Article no. **6824**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.30	4.00	0.28	50	0.3	3.0	11.4	22,0	0.05	9.20	2	6824 0.300
0.50	4.00	0.45	50	0.5	5.0	13.0	22,0	0.05	7.70	2	6824 0.500
0.50	4.00	0.45	50	0.5	5.0	13.0	22,0	0.10	7.70	2	6824 0.501
0.60	4.00	0.55	50	0.6	6.0	13.7	22,0	0.05	7.10	2	6824 0.600
0.60	4.00	0.55	50	0.6	6.0	13.7	22,0	0.10	7.10	2	6824 0.601
0.80	4.00	0.75	50	0.8	8.0	15.1	22,0	0.05	6.00	2	6824 0.800
0.80	4.00	0.75	50	0.8	8.0	15.1	22,0	0.10	6.10	2	6824 0.801
0.80	4.00	0.75	50	0.8	8.0	15.1	22,0	0.20	6.10	2	6824 0.802
1.00	4.00	0.92	50	1.0	10.0	16.7	22,0	0.10	5.10	2	6824 1.001
1.00	4.00	0.92	50	1.0	10.0	16.7	22,0	0.20	5.20	2	6824 1.002
1.00	4.00	0.92	50	1.0	10.0	16.7	22,0	0.30	5.20	2	6824 1.003
1.50	4.00	1.40	55	1.5	16.0	21.6	27,0	0.10	3.30	2	6824 1.501
1.50	4.00	1.40	55	1.5	16.0	21.6	27,0	0.20	3.30	2	6824 1.502
1.50	4.00	1.40	55	1.5	16.0	21.6	27,0	0.50	3.30	2	6824 1.505
2.00	6.00	1.85	65	2.0	20.0	29.2	29,0	0.20	3.90	2	6824 2.002
2.00	6.00	1.85	65	2.0	20.0	29.2	29,0	0.50	3.90	2	6824 2.005
2.50	6.00	2.35	65	2.5	20.0	28.1	29,0	0.20	3.50	2	6824 2.502
2.50	6.00	2.35	65	2.5	20.0	28.1	29,0	0.50	3.60	2	6824 2.505
3.00	6.00	2.85	70	3.0	25.0	31.9	34,0	0.20	2.70	2	6824 3.002
3.00	6.00	2.85	70	3.0	25.0	31.9	34,0	0.30	2.70	2	6824 3.003
3.00	6.00	2.85	70	3.0	25.0	31.9	34,0	0.50	2.70	2	6824 3.005
4.00	6.00	3.80	75	4.0	32.0	35.0	39.0	0.20	1.60	4	6824 4.002
4.00	6.00	3.80	75	4.0	32.0	35.0	39.0	0.50	1.60	4	6824 4.005
4.00	6.00	3.80	75	4.0	32.0	35.0	39.0	1.00	1.60	4	6824 4.010
5.00	6.00	4.80	80	5.0	42.0	43.6	44.0	0.50	0.60	4	6824 5.005
6.00	6.00	5.70	100	6.0	40.0	40.6	64.0	0.20		4	6824 6.002
6.00	6.00	5.70	100	6.0	40.0	40.6	64.0	0.50		4	6824 6.005
6.00	6.00	5.70	100	6.0	40.0	40.6	64.0	1.00		4	6824 6.010
8.00	8.00	7.70	100	8.0	40.0	40.6	64.0	0.50		4	6824 8.005
8.00	8.00	7.70	100	8.0	40.0	40.6	64.0	0.80		4	6824 8.008
8.00	8.00	7.70	100	8.0	40.0	40.6	64.0	1.00		4	6824 8.010

Torus end mills G-Mold 65 T



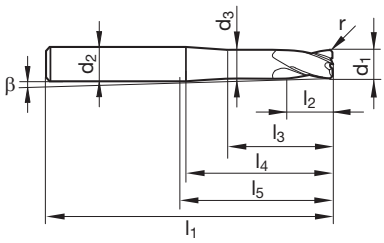
Tool material	Solid carbide
Surface	X
Type	H
Shank form	HA

P	○
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K	•
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H	•

GÜHRINGNAVIGATOR
Cutting data page 151

NEW

• neck clearance
• centre cutting



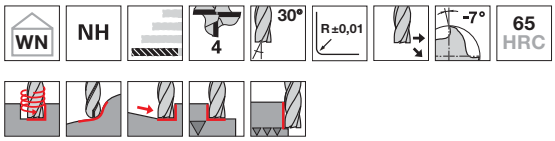


Article no.	6837

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.10	8.80	4	6837 1.001
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.20	8.90	4	6837 1.002
1.50	4.00	1.40	45	1.5	6.0	10.9	17.0	0.20	6.60	4	6837 1.502
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.10	8.30	4	6837 2.001
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.20	8.40	4	6837 2.002
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.50	8.60	4	6837 2.005
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.10	5.30	4	6837 3.001
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.30	5.30	4	6837 3.003
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.50	5.40	4	6837 3.005
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.20	3.40	4	6837 4.002
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.30	3.40	4	6837 4.003
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.50	3.40	4	6837 4.005
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	0.20	1.50	4	6837 5.002
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	0.50	1.50	4	6837 5.005
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	1.00	1.60	4	6837 5.010
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.20		4	6837 6.002
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.30		4	6837 6.003
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.50		4	6837 6.005
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	1.00		4	6837 6.010
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	1.50		4	6837 6.015
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	2.00		4	6837 6.020
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	0.30		4	6837 8.003
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	0.50		4	6837 8.005
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	1.00		4	6837 8.010
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	1.50		4	6837 8.015
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	2.00		4	6837 8.020
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	0.30		4	6837 10.003
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	0.50		4	6837 10.005
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	1.00		4	6837 10.010
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	1.50		4	6837 10.015
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	2.00		4	6837 10.020
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	3.00		4	6837 10.030
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	0.50		4	6837 12.005
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	1.00		4	6837 12.010
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	2.00		4	6837 12.020
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	3.00		4	6837 12.030

										Article no.	**6837**
d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	4.00		4	6837 12.040

Torus end mills G-Mold 65 T



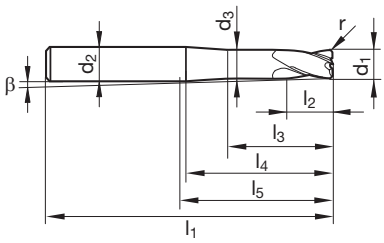
Tool material	**Solid carbide**
Surface	X
Type	NH
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 151

NEW

- neck clearance
- centre cutting

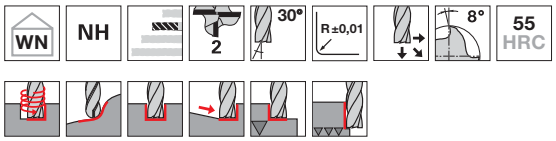




Article no. **6838**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	50	1.0	6.5	12.2	22.0	0.10	7.00	4	6838 1.001
1.00	4.00	0.92	50	1.0	6.5	12.2	22.0	0.20	7.10	4	6838 1.002
1.50	4.00	1.40	50	1.5	10.0	14.9	22.0	0.20	4.80	4	6838 1.502
2.00	6.00	1.85	57	2.0	13.0	18.7	21.0	0.10	6.10	4	6838 2.001
2.00	6.00	1.85	57	2.0	13.0	18.7	21.0	0.20	6.10	4	6838 2.002
2.00	6.00	1.85	57	2.0	13.0	18.7	21.0	0.50	6.20	4	6838 2.005
3.00	6.00	2.85	65	3.0	20.0	24.3	29.0	0.10	3.50	4	6838 3.001
3.00	6.00	2.85	65	3.0	20.0	24.3	29.0	0.30	3.50	4	6838 3.003
3.00	6.00	2.85	65	3.0	20.0	24.3	29.0	0.50	3.60	4	6838 3.005
4.00	6.00	3.80	75	4.0	25.0	28.0	39.0	0.20	2.00	4	6838 4.002
4.00	6.00	3.80	75	4.0	25.0	28.0	39.0	0.30	2.00	4	6838 4.003
4.00	6.00	3.80	75	4.0	25.0	28.0	39.0	0.50	2.00	4	6838 4.005
5.00	6.00	4.80	75	5.0	31.0	32.6	39.0	0.20	0.80	4	6838 5.002
5.00	6.00	4.80	75	5.0	31.0	32.6	39.0	0.50	0.90	4	6838 5.005
5.00	6.00	4.80	75	5.0	31.0	32.6	39.0	1.00	0.90	4	6838 5.010
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	0.20		4	6838 6.002
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	0.30		4	6838 6.003
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	0.50		4	6838 6.005
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	1.00		4	6838 6.010
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	1.50		4	6838 6.015
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	2.00		4	6838 6.020
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	0.30		4	6838 8.003
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	0.50		4	6838 8.005
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	1.00		4	6838 8.010
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	1.50		4	6838 8.015
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	2.00		4	6838 8.020
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	0.30		4	6838 10.003
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	0.50		4	6838 10.005
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	1.00		4	6838 10.010
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	1.50		4	6838 10.015
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	2.00		4	6838 10.020
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	3.00		4	6838 10.030
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	0.50		4	6838 12.005
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	1.00		4	6838 12.010
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	2.00		4	6838 12.020
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	3.00		4	6838 12.030
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	4.00		4	6838 12.040

Torus end mills G-Mold 55 T



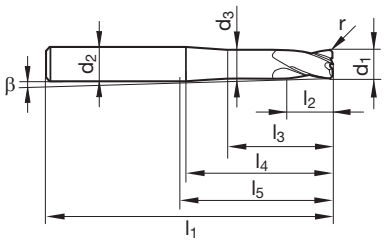
Tool material	**Solid carbide**
Surface	
Type	NH
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 151

NEW

- neck clearance
- centre cutting



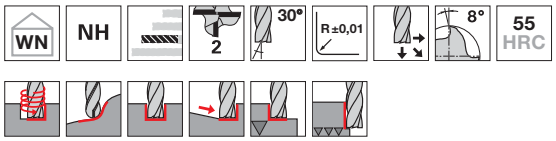


Article no. **6850**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	45	0.5	3.0	9.6	17.0	0.10	10.40	2	6850 0.501
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.10	8.80	2	6850 1.001
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.20	8.90	2	6850 1.002
1.50	4.00	1.40	45	1.5	6.0	10.9	17.0	0.20	6.60	2	6850 1.502
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.10	8.30	2	6850 2.001
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.20	8.40	2	6850 2.002
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.50	8.60	2	6850 2.005
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.10	5.30	2	6850 3.001
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.30	5.30	2	6850 3.003
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.50	5.40	2	6850 3.005
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.20	3.40	2	6850 4.002
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.30	3.40	2	6850 4.003
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.50	3.40	2	6850 4.005
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	0.20	1.50	2	6850 5.002
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	0.50	1.50	2	6850 5.005
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	1.00	1.60	2	6850 5.010
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.20		2	6850 6.002
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.30		2	6850 6.003
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.50		2	6850 6.005
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	1.00		2	6850 6.010
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	1.50		2	6850 6.015
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	2.00		2	6850 6.020
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	0.30		2	6850 8.003
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	0.50		2	6850 8.005
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	1.00		2	6850 8.010
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	1.50		2	6850 8.015
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	2.00		2	6850 8.020
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	0.30		2	6850 10.003
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	0.50		2	6850 10.005
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	1.00		2	6850 10.010
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	1.50		2	6850 10.015
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	2.00		2	6850 10.020
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	3.00		2	6850 10.030
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	0.50		2	6850 12.005
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	1.00		2	6850 12.010
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	2.00		2	6850 12.020

										Article no.	6850
d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	3.00		2	6850 12.030
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	4.00		2	6850 12.040

Torus end mills G-Mold 55 T



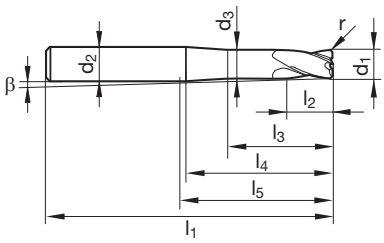
Tool material	**Solid carbide**
Surface	TiAlN
Type	NH
Shank form	HA

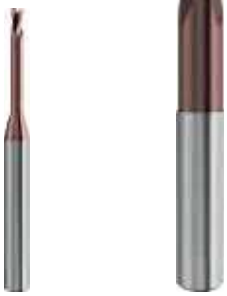
P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 151

NEW

- neck clearance
- centre cutting



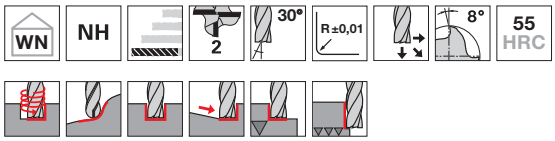


Article no. **6851**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
0.50	4.00	0.45	50	0.5	3.6	10.2	22.0	0.10	9.80	2	6851 0.501
1.00	4.00	0.92	50	1.0	6.5	12.2	22.0	0.10	7.00	2	6851 1.001
1.00	4.00	0.92	50	1.0	6.5	12.2	22.0	0.20	7.10	2	6851 1.002
1.50	4.00	1.40	50	1.5	10.0	14.9	22.0	0.20	4.80	2	6851 1.502
2.00	6.00	1.85	57	2.0	13.0	18.7	21.0	0.10	6.10	2	6851 2.001
2.00	6.00	1.85	57	2.0	13.0	18.7	21.0	0.20	6.10	2	6851 2.002
2.00	6.00	1.85	57	2.0	13.0	18.7	21.0	0.50	6.20	2	6851 2.005
3.00	6.00	2.85	65	3.0	20.0	24.3	29.0	0.10	3.50	2	6851 3.001
3.00	6.00	2.85	65	3.0	20.0	24.3	29.0	0.30	3.50	2	6851 3.003
3.00	6.00	2.85	65	3.0	20.0	24.3	29.0	0.50	3.60	2	6851 3.005
4.00	6.00	3.80	75	4.0	25.0	28.0	39.0	0.20	2.00	2	6851 4.002
4.00	6.00	3.80	75	4.0	25.0	28.0	39.0	0.30	2.00	2	6851 4.003
4.00	6.00	3.80	75	4.0	25.0	28.0	39.0	0.50	2.00	2	6851 4.005
5.00	6.00	4.80	75	5.0	31.0	32.6	39.0	0.20	0.80	2	6851 5.002
5.00	6.00	4.80	75	5.0	31.0	32.6	39.0	0.50	0.90	2	6851 5.005
5.00	6.00	4.80	75	5.0	31.0	32.6	39.0	1.00	0.90	2	6851 5.010
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	0.20		2	6851 6.002
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	0.30		2	6851 6.003
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	0.50		2	6851 6.005
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	1.00		2	6851 6.010
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	1.50		2	6851 6.015
6.00	6.00	5.70	75	6.0	38.0	38.6	39.0	2.00		2	6851 6.020
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	0.30		2	6851 8.003
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	0.50		2	6851 8.005
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	1.00		2	6851 8.010
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	1.50		2	6851 8.015
8.00	8.00	7.70	90	8.0	53.0	53.6	54.0	2.00		2	6851 8.020
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	0.30		2	6851 10.003
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	0.50		2	6851 10.005
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	1.00		2	6851 10.010
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	1.50		2	6851 10.015
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	2.00		2	6851 10.020
10.00	10.00	9.50	100	10.0	59.0	59.9	60.0	3.00		2	6851 10.030
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	0.50		2	6851 12.005
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	1.00		2	6851 12.010
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	2.00		2	6851 12.020

										Article no.	6851
d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	3.00		2	6851 12.030
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	4.00		2	6851 12.040

Torus end mills G-Mold 55 T



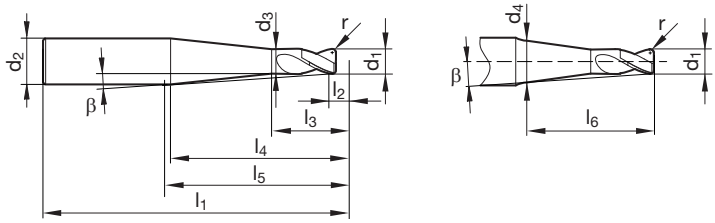
Tool material	**Solid carbide**
Surface	TiAlN
Type	NH
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 151

NEW

- neck clearance
- centre cutting

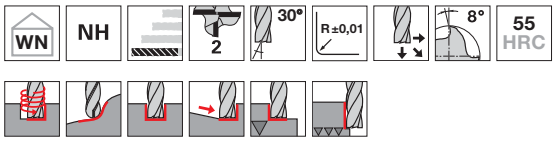




Article no. **6852**

d1 f8	d2 h5	d3	d4	l1	l2	l3	l4	l5	l6	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	1.99	50	1.0	2.5	23.7	22.0	20.0	0.20	1.50	2	6852 1.002
2.00	6.00	1.85	4.04	80	2.0	5.0	43.6	44.0	40.0	0.20	1.50	2	6852 2.002
2.00	6.00	1.85	4.04	80	2.0	5.0	43.6	44.0	40.0	0.50	1.50	2	6852 2.005
3.00	6.00	2.85	5.04	80	3.0	7.5	41.8	44.0	40.0	0.20	1.50	2	6852 3.002
3.00	6.00	2.85	5.04	80	3.0	7.5	41.8	44.0	40.0	0.50	1.50	2	6852 3.005
4.00	6.00	3.80		80	4.0	10.0	40.1	44.0		0.20	1.50	2	6852 4.002
4.00	6.00	3.80		80	4.0	10.0	40.1	44.0		0.50	1.50	2	6852 4.005
6.00	8.00	5.70		90	6.0	15.0	40.1	54.0		0.20	1.50	2	6852 6.002
6.00	8.00	5.70		90	6.0	15.0	40.1	54.0		0.50	1.50	2	6852 6.005
6.00	8.00	5.70		90	6.0	15.0	40.1	54.0		1.00	1.50	2	6852 6.010
8.00	10.00	7.70		100	8.0	20.0	40.1	60.0		0.30	1.50	2	6852 8.003
8.00	10.00	7.70		100	8.0	20.0	40.1	60.0		0.50	1.50	2	6852 8.005
8.00	10.00	7.70		100	8.0	20.0	40.1	60.0		1.00	1.50	2	6852 8.010
10.00	12.00	9.50		120	10.0	25.0	40.1	75.0		0.50	1.50	2	6852 10.005
10.00	12.00	9.50		120	10.0	25.0	40.1	75.0		1.00	1.50	2	6852 10.010
10.00	12.00	9.50		120	10.0	25.0	40.1	75.0		1.50	1.50	2	6852 10.015
10.00	12.00	9.50		120	10.0	25.0	40.1	75.0		2.00	1.50	2	6852 10.020

Torus end mills G-Mold 55 T



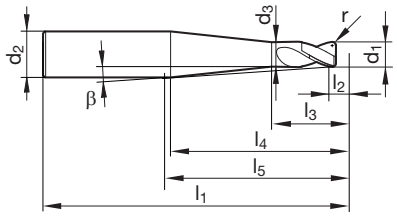
Tool material	**Solid carbide**
Surface	TiAlN
Type	NH
Shank form	HA

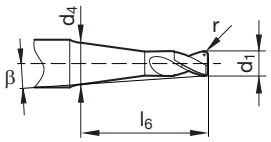
P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 151

NEW

- neck clearance
- centre cutting



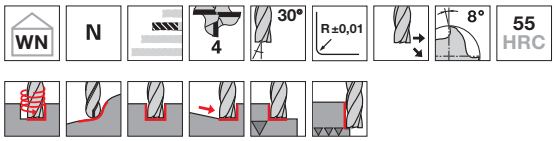




Article no. **6853**

d1 f8	d2 h5	d3	d4	l1	l2	l3	l4	l5	l6	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	1.65	63	1.0	2.5	24.4	35.0	20.0	0.20	1.00	2	6853 1.002
2.00	6.00	1.85	3.35	80	2.0	5.0	44.9	44.0	40.0	0.20	1.00	2	6853 2.002
2.00	6.00	1.85	3.35	80	2.0	5.0	44.9	44.0	40.0	0.50	1.00	2	6853 2.005
3.00	6.00	2.85	4.35	80	3.0	7.5	43.1	44.0	40.0	0.20	1.00	2	6853 3.002
3.00	6.00	2.85	4.35	80	3.0	7.5	43.1	44.0	40.0	0.50	1.00	2	6853 3.005
4.00	6.00	3.80	5.35	80	4.0	10.0	41.2	44.0	40.0	0.20	1.00	2	6853 4.002
4.00	6.00	3.80	5.35	80	4.0	10.0	41.2	44.0	40.0	0.50	1.00	2	6853 4.005
6.00	8.00	5.70	7.70	100	6.0	15.0	50.6	64.0	50.0	0.20	1.00	2	6853 6.002
6.00	8.00	5.70	7.70	100	6.0	15.0	50.6	64.0	50.0	0.50	1.00	2	6853 6.005
8.00	10.00	7.70		100	8.0	20.0	60.2	60.0		0.50	1.00	2	6853 8.005
8.00	10.00	7.70		100	8.0	20.0	60.2	60.0		1.00	1.00	2	6853 8.010

Torus end mills G-Mold 55 T



Tool material	**Solid carbide**
Surface	TiAlN
Type	N
Shank form	HA

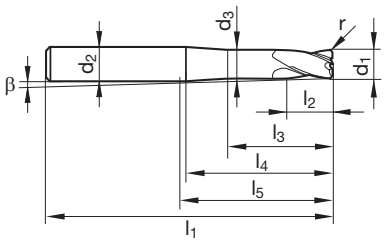
P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR

Cutting data page 151

NEW

- neck clearance
- centre cutting





Article no. **6854**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.10	8.80	4	6854 1.001
1.00	4.00	0.92	45	1.0	4.0	9.7	17.0	0.20	8.90	4	6854 1.002
1.50	4.00	1.40	45	1.5	6.0	10.9	17.0	0.20	6.60	4	6854 1.502
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.10	8.30	4	6854 2.001
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.20	8.40	4	6854 2.002
2.00	6.00	1.85	54	2.0	8.0	13.7	18.0	0.50	8.60	4	6854 2.005
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.10	5.30	4	6854 3.001
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.30	5.30	4	6854 3.003
3.00	6.00	2.85	54	3.0	12.0	16.3	18.0	0.50	5.40	4	6854 3.005
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.20	3.40	4	6854 4.002
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.30	3.40	4	6854 4.003
4.00	6.00	3.80	57	4.0	14.0	17.0	21.0	0.50	3.40	4	6854 4.005
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	0.20	1.50	4	6854 5.002
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	0.50	1.50	4	6854 5.005
5.00	6.00	4.80	57	5.0	17.0	18.6	21.0	1.00	1.60	4	6854 5.010
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.20		4	6854 6.002
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.30		4	6854 6.003
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	0.50		4	6854 6.005
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	1.00		4	6854 6.010
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	1.50		4	6854 6.015
6.00	6.00	5.70	57	6.0	20.0	20.6	21.0	2.00		4	6854 6.020
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	0.30		4	6854 8.003
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	0.50		4	6854 8.005
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	1.00		4	6854 8.010
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	1.50		4	6854 8.015
8.00	8.00	7.70	63	8.0	26.0	26.6	27.0	2.00		4	6854 8.020
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	0.30		4	6854 10.003
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	0.50		4	6854 10.005
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	1.00		4	6854 10.010
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	1.50		4	6854 10.015
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	2.00		4	6854 10.020
10.00	10.00	9.50	72	10.0	31.0	31.9	32.0	3.00		4	6854 10.030
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	0.50		4	6854 12.005
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	1.00		4	6854 12.010
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	2.00		4	6854 12.020
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	3.00		4	6854 12.030
12.00	12.00	11.50	83	12.0	37.0	37.9	38.0	4.00		4	6854 12.040

Torus end mills G-Mold 55 T

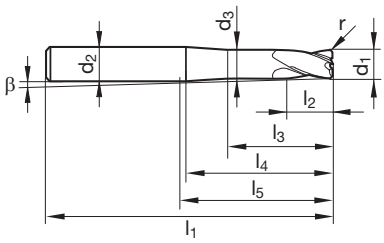
Tool material	Solid carbide
Surface	
Type	N
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 151

NEW

• neck clearance
• centre cutting

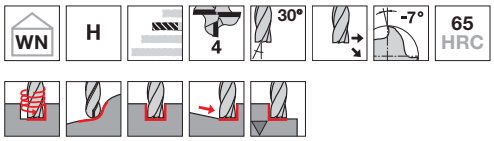




Article no. **6855**

d1 f8	d2 h5	d3	l1	l2	l3	l4	l5	r	β	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm	mm	°		
1.00	4.00	0.92	50	1.0	6.5	12.2	20.0	0.10	7.00	4	6855 1.001
1.00	4.00	0.92	50	1.0	6.5	12.2	20.0	0.20	7.10	4	6855 1.002
1.50	4.00	1.40	50	1.5	10.0	14.9	20.0	0.20	4.80	4	6855 1.502
2.00	6.00	1.85	57	2.0	13.0	18.7	17.0	0.10	6.10	4	6855 2.001
2.00	6.00	1.85	57	2.0	13.0	18.7	17.0	0.20	6.10	4	6855 2.002
2.00	6.00	1.85	57	2.0	13.0	18.7	17.0	0.50	6.20	4	6855 2.005
3.00	6.00	2.85	65	3.0	20.0	24.3	25.0	0.10	3.50	4	6855 3.001
3.00	6.00	2.85	65	3.0	20.0	24.3	25.0	0.30	3.50	4	6855 3.003
3.00	6.00	2.85	65	3.0	20.0	24.3	25.0	0.50	3.60	4	6855 3.005
4.00	6.00	3.80	75	4.0	25.0	28.0	35.0	0.20	2.00	4	6855 4.002
4.00	6.00	3.80	75	4.0	25.0	28.0	35.0	0.30	2.00	4	6855 4.003
4.00	6.00	3.80	75	4.0	25.0	28.0	35.0	0.50	2.00	4	6855 4.005
5.00	6.00	4.80	75	5.0	31.0	32.6	35.0	0.20	0.80	4	6855 5.002
5.00	6.00	4.80	75	5.0	31.0	32.6	35.0	0.50	0.90	4	6855 5.005
5.00	6.00	4.80	75	5.0	31.0	32.6	35.0	1.00	0.90	4	6855 5.010
6.00	6.00	5.70	75	6.0	38.0	38.6	35.0	0.20		4	6855 6.002
6.00	6.00	5.70	75	6.0	38.0	38.6	35.0	0.30		4	6855 6.003
6.00	6.00	5.70	75	6.0	38.0	38.6	35.0	0.50		4	6855 6.005
6.00	6.00	5.70	75	6.0	38.0	38.6	35.0	1.00		4	6855 6.010
6.00	6.00	5.70	75	6.0	38.0	38.6	35.0	1.50		4	6855 6.015
6.00	6.00	5.70	75	6.0	38.0	38.6	35.0	2.00		4	6855 6.020
8.00	8.00	7.70	90	8.0	53.0	53.6	50.0	0.30		4	6855 8.003
8.00	8.00	7.70	90	8.0	53.0	53.6	50.0	0.50		4	6855 8.005
8.00	8.00	7.70	90	8.0	53.0	53.6	50.0	1.00		4	6855 8.010
8.00	8.00	7.70	90	8.0	53.0	53.6	50.0	1.50		4	6855 8.015
8.00	8.00	7.70	90	8.0	53.0	53.6	50.0	2.00		4	6855 8.020
10.00	10.00	9.50	100	10.0	59.0	59.9	55.0	0.30		4	6855 10.003
10.00	10.00	9.50	100	10.0	59.0	59.9	55.0	0.50		4	6855 10.005
10.00	10.00	9.50	100	10.0	59.0	59.9	55.0	1.00		4	6855 10.010
10.00	10.00	9.50	100	10.0	59.0	59.9	55.0	1.50		4	6855 10.015
10.00	10.00	9.50	100	10.0	59.0	59.9	55.0	2.00		4	6855 10.020
10.00	10.00	9.50	100	10.0	59.0	59.9	55.0	3.00		4	6855 10.030
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	0.50		4	6855 12.005
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	1.00		4	6855 12.010
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	2.00		4	6855 12.020
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	3.00		4	6855 12.030
12.00	12.00	11.50	120	12.0	74.0	74.9	75.0	4.00		4	6855 12.040

High feed end mills G-Mold 65 HF



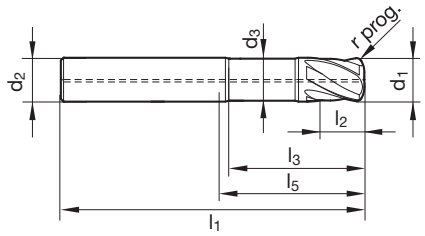
Tool material	**Solid carbide**
Surface	
Type	H
Shank form	HA

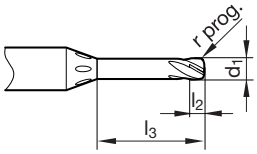
P	•
M	•
K	•
N	
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 152

- for high-feed roughing with low ap and maximum fz
- with central internal cooling from Ø 4 mm
- with GühroJet peripheral cooling from Ø 1-3 mm
- neck clearance
- without centre cutting

NEW



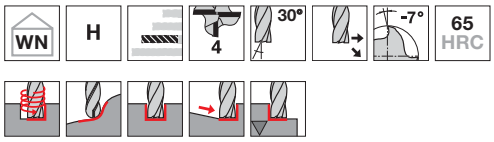




Article no. **6830**

d1 h10	d2 h6	d3	l1	l2	l3	l5	r prog.	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm		
1.00	4.00	0.92	50	0.6	5.0	22.0	0.18	4	6830 1.000
1.50	4.00	1.40	50	1.0	7.5	22.0	0.25	4	6830 1.500
2.00	6.00	1.85	57	1.2	10.0	21.0	0.35	4	6830 2.000
2.50	6.00	2.35	57	1.5	12.5	21.0	0.40	4	6830 2.500
3.00	6.00	2.85	57	2.0	15.0	21.0	0.50	4	6830 3.000
4.00	6.00	3.80	57	3.0	18.0	21.0	0.80	4	6830 4.000
5.00	6.00	4.80	57	4.0	20.0	21.0	0.80	4	6830 5.000
6.00	6.00	5.70	57	5.0	20.0	21.0	1.00	4	6830 6.000
8.00	8.00	7.70	63	6.0	26.0	27.0	1.50	4	6830 8.000
10.00	10.00	9.50	72	8.0	30.0	32.0	2.00	4	6830 10.000
12.00	12.00	11.50	83	10.0	36.0	38.0	2.00	4	6830 12.000
16.00	16.00	15.50	92	12.0	42.0	44.0	2.50	4	6830 16.000

High feed end mills G-Mold 65 HF



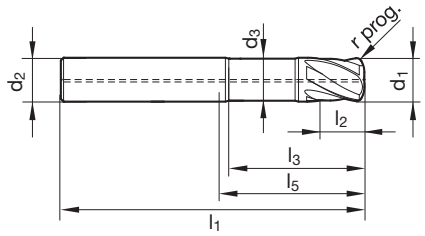
Tool material	**Solid carbide**
Surface	TiAlN
Type	H
Shank form	~HA

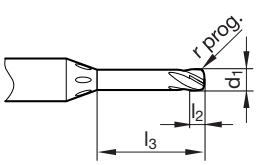
P	•
M	•
K	•
N	
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 152

NEW

- for high-feed roughing with low ap and maximum fz
- with central internal cooling from Ø 4 mm
- with GühroJet peripheral cooling from Ø 1-3 mm
- neck clearance
- without centre cutting



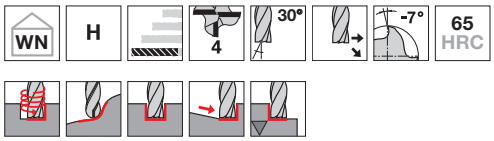




Article no. **6814**

d1 h10	d2 h6	d3	l1	l2	l3	l5	r prog.	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm		
1.00	4.00	0.92	50	0.6	8.0	24.8	0.18	4	6814 1.000
1.50	4.00	1.40	50	1.0	12.0	25.2	0.25	4	6814 1.500
2.00	6.00	1.85	57	1.2	16.0	29.1	0.35	4	6814 2.000
2.50	6.00	2.35	65	1.5	20.0	33.5	0.40	4	6814 2.500
3.00	6.00	2.85	65	2.0	24.0	34.0	0.50	4	6814 3.000
4.00	6.00	3.80	65	3.0	26.0	29.0	0.80	4	6814 4.000
5.00	6.00	4.80	65	4.0	27.0	29.0	0.80	4	6814 5.000
6.00	6.00	5.70	65	5.0	28.0	29.0	1.00	4	6814 6.000
8.00	8.00	7.70	75	6.0	38.0	39.0	1.50	4	6814 8.000
10.00	10.00	9.50	100	8.0	58.0	60.0	2.00	4	6814 10.000
12.00	12.00	11.50	100	10.0	53.0	55.0	2.00	4	6814 12.000
16.00	16.00	15.50	125	12.0	75.0	77.0	2.50	4	6814 16.000

High feed end mills G-Mold 65 HF



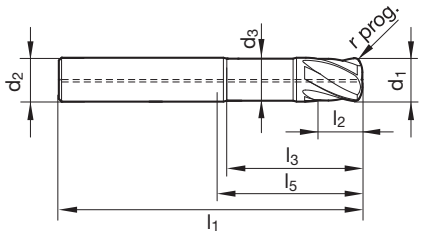
Tool material	**Solid carbide**
Surface	
Type	H
Shank form	HA

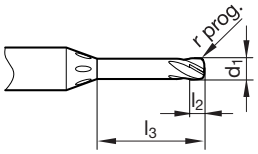
P	•
M	•
K	•
N	
S	•
H	•

GÜHRINGNAVIGATOR
Cutting data page 152

- for high-feed roughing with low ap and maximum fz
- with central internal cooling from Ø 4 mm
- with GühroJet peripheral cooling from Ø 1-3 mm
- neck clearance
- without centre cutting

NEW



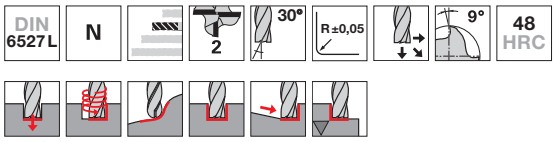




Article no. **6831**

d1 h10	d2 h6	d3	l1	l2	l3	l5	r prog.	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm		
1.00	4.00	0.92	50	0.6	10.0	22.0	0.18	4	6831 1.000
1.50	4.00	1.40	50	1.0	15.0	22.0	0.25	4	6831 1.500
2.00	6.00	1.85	65	1.2	20.0	29.0	0.35	4	6831 2.000
2.50	6.00	2.35	65	1.5	25.0	29.0	0.40	4	6831 2.500
3.00	6.00	2.85	80	2.0	30.0	44.0	0.50	4	6831 3.000
4.00	6.00	3.80	80	3.0	32.0	44.0	0.80	4	6831 4.000
5.00	6.00	4.80	80	4.0	40.0	44.0	0.80	4	6831 5.000
6.00	6.00	5.70	80	5.0	43.0	44.0	1.00	4	6831 6.000
8.00	8.00	7.70	100	6.0	63.0	64.0	1.50	4	6831 8.000
10.00	10.00	9.50	120	8.0	78.0	80.0	2.00	4	6831 10.000
12.00	12.00	11.50	120	10.0	73.0	75.0	2.00	4	6831 12.000
16.00	16.00	15.50	150	12.0	100.0	102.0	2.50	4	6831 16.000

Slot drills with corner radius (2-fluted)



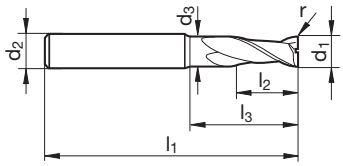
Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	HA

P	•
M	•
K	•
N	•
S	
H	

GÜHRINGNAVIGATOR

Cutting data page 161

- neck clearance
- centre cutting

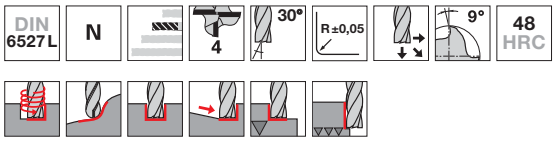




Article no. **3561**

d1 f9	d2 h6	d3	l1	l2	l3	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
1.00	4.00	0.92	50	2.0	6.0	0.10	2	3561 1.001
1.50	4.00	1.40	50	3.0	9.0	0.20	2	3561 1.502
2.00	6.00	1.85	57	6.0	12.0	0.20	2	3561 2.002
2.00	6.00	1.85	57	6.0	12.0	0.50	2	3561 2.005
3.00	6.00	2.85	57	7.0	14.0	0.20	2	3561 3.002
3.00	6.00	2.85	57	7.0	14.0	0.50	2	3561 3.005
4.00	6.00	3.80	57	8.0	16.0	0.20	2	3561 4.002
4.00	6.00	3.80	57	8.0	16.0	0.50	2	3561 4.005
5.00	6.00	4.80	57	10.0	18.0	0.20	2	3561 5.002
6.00	6.00	5.70	57	10.0	20.0	0.50	2	3561 6.005
6.00	6.00	5.70	57	10.0	20.0	1.00	2	3561 6.010
8.00	8.00	7.70	63	16.0	26.0	0.50	2	3561 8.005
8.00	8.00	7.70	63	16.0	26.0	1.00	2	3561 8.010
8.00	8.00	7.70	63	16.0	26.0	1.50	2	3561 8.015
8.00	8.00	7.70	63	16.0	26.0	2.00	2	3561 8.020
10.00	10.00	9.50	72	19.0	30.0	0.50	2	3561 10.005
10.00	10.00	9.50	72	19.0	30.0	1.00	2	3561 10.010
10.00	10.00	9.50	72	19.0	30.0	1.50	2	3561 10.015
10.00	10.00	9.50	72	19.0	30.0	2.00	2	3561 10.020
12.00	12.00	11.50	83	22.0	36.0	0.50	2	3561 12.005
12.00	12.00	11.50	83	22.0	36.0	1.00	2	3561 12.010
12.00	12.00	11.50	83	22.0	36.0	1.50	2	3561 12.015
12.00	12.00	11.50	83	22.0	36.0	2.00	2	3561 12.020
16.00	16.00	15.50	92	26.0	42.0	1.00	2	3561 16.010
16.00	16.00	15.50	92	26.0	42.0	1.50	2	3561 16.015
16.00	16.00	15.50	92	26.0	42.0	2.00	2	3561 16.020
20.00	20.00	19.50	104	32.0	52.0	1.00	2	3561 20.010
20.00	20.00	19.50	104	32.0	52.0	1.50	2	3561 20.015
20.00	20.00	19.50	104	32.0	52.0	2.00	2	3561 20.020

End mills with corner radius (4-fluted)

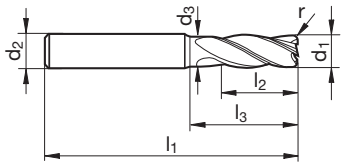


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	HA

P	•
M	•
K	•
N	•
S	○
H	○

GÜHRINGNAVIGATOR
Cutting data page 161

- neck clearance
- centre cutting





Article no. **3562**

d1 f9	d2 h6	d3	l1	l2	l3	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
1.00	4.00	0.92	50	3.0	6.0	0.10	4	3562 1.001
1.50	4.00	1.40	50	4.0	9.0	0.20	4	3562 1.502
2.00	6.00	1.85	57	7.0	12.0	0.20	4	3562 2.002
2.00	6.00	1.85	57	7.0	12.0	0.50	4	3562 2.005
3.00	6.00	2.85	57	8.0	14.0	0.20	4	3562 3.002
3.00	6.00	2.85	57	8.0	14.0	0.50	4	3562 3.005
4.00	6.00	3.80	57	11.0	16.0	0.20	4	3562 4.002
4.00	6.00	3.80	57	11.0	16.0	0.50	4	3562 4.005
5.00	6.00	4.80	57	13.0	18.0	0.20	4	3562 5.002
6.00	6.00	5.70	57	13.0	20.0	0.50	4	3562 6.005
6.00	6.00	5.70	57	13.0	20.0	1.00	4	3562 6.010
8.00	8.00	7.70	63	19.0	26.0	0.50	4	3562 8.005
8.00	8.00	7.70	63	19.0	26.0	1.00	4	3562 8.010
8.00	8.00	7.70	63	19.0	26.0	1.50	4	3562 8.015
8.00	8.00	7.70	63	19.0	26.0	2.00	4	3562 8.020
10.00	10.00	9.50	72	22.0	30.0	0.50	4	3562 10.005
10.00	10.00	9.50	72	22.0	30.0	0.80	4	3562 10.008
10.00	10.00	9.50	72	22.0	30.0	1.00	4	3562 10.010
10.00	10.00	9.50	72	22.0	30.0	1.50	4	3562 10.015
10.00	10.00	9.50	72	22.0	30.0	2.00	4	3562 10.020
12.00	12.00	11.50	83	26.0	36.0	0.50	4	3562 12.005
12.00	12.00	11.50	83	26.0	36.0	0.80	4	3562 12.008
12.00	12.00	11.50	83	26.0	36.0	1.00	4	3562 12.010
12.00	12.00	11.50	83	26.0	36.0	1.50	4	3562 12.015
12.00	12.00	11.50	83	26.0	36.0	2.00	4	3562 12.020
16.00	16.00	15.50	92	32.0	42.0	1.00	4	3562 16.010
16.00	16.00	15.50	92	32.0	42.0	1.50	4	3562 16.015
16.00	16.00	15.50	92	32.0	42.0	2.00	4	3562 16.020
20.00	20.00	19.50	104	38.0	52.0	1.00	4	3562 20.010
20.00	20.00	19.50	104	38.0	52.0	1.50	4	3562 20.015
20.00	20.00	19.50	104	38.0	52.0	2.00	4	3562 20.020

Multi-tooth end mills with corner radius GH 100 U

DIN 6527 L | NH | 6+ | 45° | R ±0,02 | 7° | 55 HRC

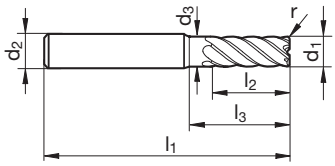
Tool material	Solid carbide
Surface	F
Type	NH
Shank form	HA

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRING NAVIGATOR

Cutting data page 159

- neck clearance
- without centre cutting





Article no. **3563**

d1 f9	d2 h6	d3	l1	l2	l3	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
3.00	6.00	2.85	57	8.0	14.0	0.20	6	3563 3.002
3.00	6.00	2.85	57	8.0	14.0	0.50	6	3563 3.005
4.00	6.00	3.80	57	11.0	16.0	0.20	6	3563 4.002
4.00	6.00	3.80	57	11.0	16.0	0.50	6	3563 4.005
5.00	6.00	4.80	57	13.0	18.0	0.20	6	3563 5.002
5.00	6.00	4.80	57	13.0	18.0	0.50	6	3563 5.005
6.00	6.00	5.70	57	13.0	20.0	0.20	6	3563 6.002
6.00	6.00	5.70	57	13.0	20.0	0.50	6	3563 6.005
6.00	6.00	5.70	57	13.0	20.0	1.00	6	3563 6.010
8.00	8.00	7.70	63	19.0	26.0	0.30	6	3563 8.003
8.00	8.00	7.70	63	19.0	26.0	0.50	6	3563 8.005
8.00	8.00	7.70	63	19.0	26.0	1.00	6	3563 8.010
8.00	8.00	7.70	63	19.0	26.0	1.50	6	3563 8.015
8.00	8.00	7.70	63	19.0	26.0	2.00	6	3563 8.020
10.00	10.00	9.50	72	22.0	30.0	0.30	6	3563 10.003
10.00	10.00	9.50	72	22.0	30.0	0.50	6	3563 10.005
10.00	10.00	9.50	72	22.0	30.0	1.00	6	3563 10.010
10.00	10.00	9.50	72	22.0	30.0	1.50	6	3563 10.015
10.00	10.00	9.50	72	22.0	30.0	2.00	6	3563 10.020
12.00	12.00	11.50	83	26.0	36.0	0.50	6	3563 12.005
12.00	12.00	11.50	83	26.0	36.0	1.00	6	3563 12.010
12.00	12.00	11.50	83	26.0	36.0	1.50	6	3563 12.015
12.00	12.00	11.50	83	26.0	36.0	2.00	6	3563 12.020
16.00	16.00	15.50	92	32.0	42.0	0.50	6	3563 16.005
16.00	16.00	15.50	92	32.0	42.0	1.00	6	3563 16.010
16.00	16.00	15.50	92	32.0	42.0	1.50	6	3563 16.015
16.00	16.00	15.50	92	32.0	42.0	2.00	6	3563 16.020
20.00	20.00	19.50	104	38.0	52.0	0.50	6	3563 20.005
20.00	20.00	19.50	104	38.0	52.0	1.00	6	3563 20.010
20.00	20.00	19.50	104	38.0	52.0	1.50	6	3563 20.015
20.00	20.00	19.50	104	38.0	52.0	2.00	6	3563 20.020

Multi-tooth end mills GH 100 U

DIN 6527 L | NH | 6 | 45° | R ±0,02 | 7° | 55 HRC

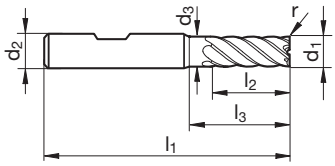
Tool material	**Solid carbide**
Surface	R
Type	NH
Shank form	HB

P	•
M	•
K	
N	•
S	•
H	○

GÜHRINGNAVIGATOR

Cutting data page 159

- Raptor coating
- neck clearance
- without centre cutting

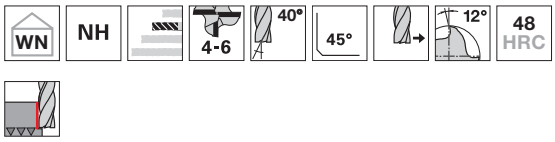




Article no. **6969**

d1 f9	d2 h6	d3	l1	l2	l3	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
6.00	6.00	5.70	57	13.0	20.0	0.50	6	6969 6.005
6.00	6.00	5.70	57	13.0	20.0	1.00	6	6969 6.010
8.00	8.00	7.70	63	19.0	26.0	0.50	6	6969 8.005
8.00	8.00	7.70	63	19.0	26.0	1.00	6	6969 8.010
8.00	8.00	7.70	63	19.0	26.0	1.50	6	6969 8.015
8.00	8.00	7.70	63	19.0	26.0	2.00	6	6969 8.020
10.00	10.00	9.50	72	22.0	30.0	0.50	6	6969 10.005
10.00	10.00	9.50	72	22.0	30.0	1.00	6	6969 10.010
10.00	10.00	9.50	72	22.0	30.0	1.50	6	6969 10.015
10.00	10.00	9.50	72	22.0	30.0	2.00	6	6969 10.020
12.00	12.00	11.50	83	26.0	36.0	0.50	6	6969 12.005
12.00	12.00	11.50	83	26.0	36.0	1.00	6	6969 12.010
12.00	12.00	11.50	83	26.0	36.0	1.50	6	6969 12.015
12.00	12.00	11.50	83	26.0	36.0	2.00	6	6969 12.020
16.00	16.00	15.50	92	32.0	42.0	0.50	6	6969 16.005
16.00	16.00	15.50	92	32.0	42.0	1.00	6	6969 16.010
16.00	16.00	15.50	92	32.0	42.0	1.50	6	6969 16.015
16.00	16.00	15.50	92	32.0	42.0	2.00	6	6969 16.020
20.00	20.00	19.50	104	38.0	52.0	0.50	6	6969 20.005
20.00	20.00	19.50	104	38.0	52.0	1.00	6	6969 20.010
20.00	20.00	19.50	104	38.0	52.0	1.50	6	6969 20.015
20.00	20.00	19.50	104	38.0	52.0	2.00	6	6969 20.020

Finishing end mills G-Mold µ 48 F



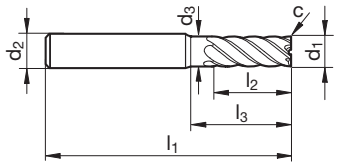
Tool material	**Solid carbide**
Surface	X
Type	NH
Shank form	HA

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 159

NEW

- restricted tolerances for maximum component accuracy
- max. taper 0.005 mm
- neck clearance
- Ø 3-8 mm with centre cutting
- Ø 10-20 mm without centre cutting

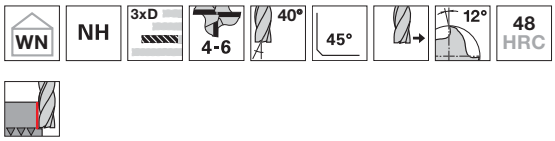




Article no. **6825**

d1 f8	d2 h5	d3	l1	l2	l3	c	Z	Order no.
mm	mm	mm	mm	mm	mm	mm x 45°		
3.00	6.00	2.85	57	8.0	15.0	0.06	4	6825 3.000
4.00	6.00	3.80	57	11.0	18.0	0.08	4	6825 4.000
5.00	6.00	4.80	57	13.0	18.0	0.10	4	6825 5.000
6.00	6.00	5.70	57	13.0	20.0	0.12	4	6825 6.000
8.00	8.00	7.70	63	19.0	26.0	0.08	6	6825 8.000
10.00	10.00	9.50	72	22.0	30.0	0.10	6	6825 10.000
12.00	12.00	11.50	83	26.0	36.0	0.12	6	6825 12.000
16.00	16.00	15.50	92	32.0	42.0	0.16	6	6825 16.000
20.00	20.00	19.50	104	38.0	52.0	0.20	6	6825 20.000

Finishing end mills G-Mold µ 48 F



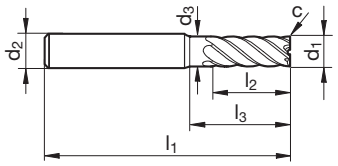
Tool material	**Solid carbide**
Surface	X
Type	NH
Shank form	HA

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 159

NEW

- restricted tolerances for maximum component accuracy
- max. taper 0.005 mm
- neck clearance
- Ø 3-8 mm with centre cutting
- Ø 10-20 mm without centre cutting

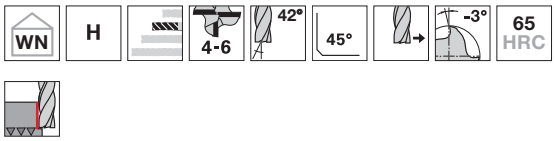




Article no. **6826**

d1 f8	d2 h5	d3	l1	l2	l3	c	Z	Order no.
mm	mm	mm	mm	mm	mm	mm x 45°		
3.00	6.00	2.85	65	12.0	24.0	0.06	4	6826 3.000
4.00	6.00	3.80	65	16.0	26.0	0.08	4	6826 4.000
5.00	6.00	4.80	65	18.0	26.0	0.10	4	6826 5.000
6.00	6.00	5.70	65	21.0	28.0	0.12	4	6826 6.000
8.00	8.00	7.70	75	26.0	38.0	0.08	6	6826 8.000
10.00	10.00	9.50	80	30.0	38.0	0.10	6	6826 10.000
12.00	12.00	11.50	93	36.0	46.0	0.12	6	6826 12.000
16.00	16.00	15.50	108	48.0	58.0	0.16	6	6826 16.000
20.00	20.00	19.50	126	60.0	74.0	0.20	6	6826 20.000

Finishing end mills G-Mold µ 65 F



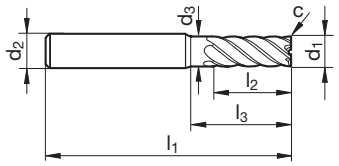
Tool material	**Solid carbide**
Surface	X
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 159

NEW

- restricted tolerances for maximum component accuracy
- max. taper 0.005 mm
- neck clearance
- Ø 3-8 mm with centre cutting
- Ø 10-20 mm without centre cutting

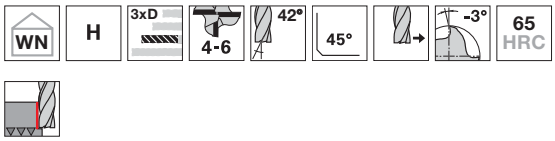




Article no.	**6827**

d1 f8	d2	d3	l1	l2	l3	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm x 45°		
3.00	6.00	2.85	57	8.0	15.0	0.06	4	6827 3.000
4.00	6.00	3.80	57	11.0	18.0	0.08	4	6827 4.000
5.00	6.00	4.80	57	13.0	18.0	0.10	4	6827 5.000
6.00	6.00	5.70	57	13.0	20.0	0.12	4	6827 6.000
8.00	8.00	7.70	63	19.0	26.0	0.08	6	6827 8.000
10.00	10.00	9.50	72	22.0	30.0	0.10	6	6827 10.000
12.00	12.00	11.50	83	26.0	36.0	0.12	6	6827 12.000
16.00	16.00	15.50	92	32.0	42.0	0.16	6	6827 16.000
20.00	20.00	19.50	104	38.0	52.0	0.20	6	6827 20.000

Finishing end mills G-Mold µ 65 F



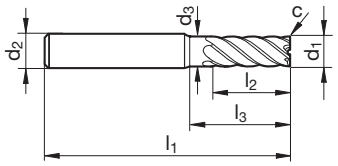
Tool material	**Solid carbide**
Surface	X
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 159

NEW

- restricted tolerances for maximum component accuracy
- max. taper 0.005 mm
- neck clearance
- Ø 3-8 mm with centre cutting
- Ø 10-20 mm without centre cutting

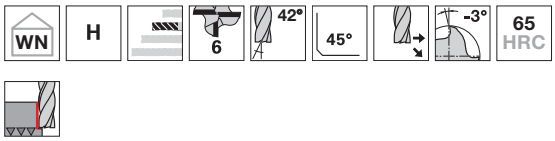




Article no.	**6828**

d1 f8	d2	d3	l1	l2	l3	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm x 45°		
3.00	6.00	2.85	65	12.0	24.0	0.06	4	6828 3.000
4.00	6.00	3.80	65	16.0	26.0	0.08	4	6828 4.000
5.00	6.00	4.80	65	18.0	26.0	0.10	4	6828 5.000
6.00	6.00	5.70	65	21.0	28.0	0.12	4	6828 6.000
8.00	8.00	7.70	75	26.0	38.0	0.08	6	6828 8.000
10.00	10.00	9.50	80	30.0	38.0	0.10	6	6828 10.000
12.00	12.00	11.50	93	36.0	46.0	0.12	6	6828 12.000
16.00	16.00	15.50	108	48.0	58.0	0.16	6	6828 16.000
20.00	20.00	19.50	126	60.0	74.0	0.20	6	6828 20.000

Finishing end mills G-Mold 65 F



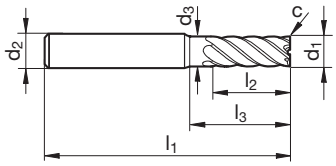
Tool material	**Solid carbide**
Surface	Y
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 159

NEW

- without centre cutting
- neck clearance

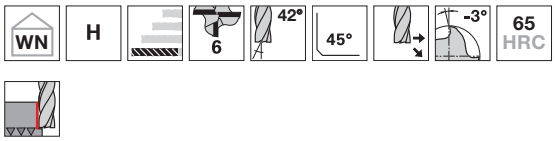




Article no. **6945**

d1 f8	d2 h5	d3	l1	l2	l3	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm x 45°		
3.00	6.00	2.85	57	8.0	12.0	0.03	6	6945 3.000
4.00	6.00	3.80	57	11.0	15.0	0.04	6	6945 4.000
5.00	6.00	4.80	57	13.0	18.0	0.05	6	6945 5.000
6.00	6.00	5.70	57	13.0	20.0	0.06	6	6945 6.000
8.00	8.00	7.70	63	19.0	26.0	0.08	6	6945 8.000
10.00	10.00	9.50	72	22.0	31.0	0.10	6	6945 10.000
12.00	12.00	11.50	83	26.0	37.0	0.12	6	6945 12.000
14.00	14.00	13.50	83	26.0	37.0	0.14	6	6945 14.000
16.00	16.00	15.50	92	32.0	43.0	0.16	6	6945 16.000
20.00	20.00	19.50	104	38.0	53.0	0.20	6	6945 20.000

Finishing end mills G-Mold 65 F



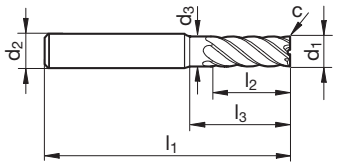
Tool material	**Solid carbide**
Surface	Y
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 159

- without centre cutting
- neck clearance

NEW

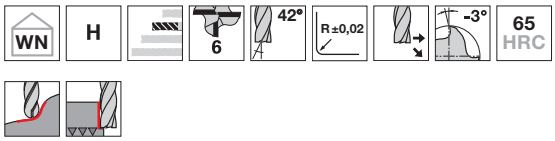




Article no. **6946**

d1 f8	d2 h5	d3	l1	l2	l3	c	Z	Order no.
mm	mm	mm	mm	mm	mm	mm x 45°		
3.00	6.00	2.85	65	11.0	21.0	0.03	6	6946 3.000
4.00	6.00	3.80	65	14.0	26.0	0.04	6	6946 4.000
5.00	6.00	4.80	75	17.0	32.0	0.05	6	6946 5.000
6.00	6.00	5.70	75	20.0	38.0	0.06	6	6946 6.000
8.00	8.00	7.70	90	28.0	53.0	0.08	6	6946 8.000
10.00	10.00	9.50	100	31.0	59.0	0.10	6	6946 10.000
12.00	12.00	11.50	114	36.0	68.0	0.12	6	6946 12.000
14.00	14.00	13.50	100	42.0	54.0	0.14	6	6946 14.000
16.00	16.00	15.50	125	52.0	76.0	0.16	6	6946 16.000
20.00	20.00	19.50	150	62.0	100.0	0.20	6	6946 20.000

Finishing end mills with corner radius G-Mold 65 FR



Tool material	**Solid carbide**
Surface	Y
Type	H
Shank form	HA

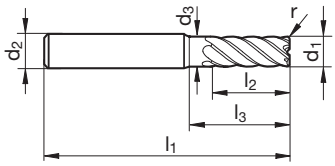
P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR

Cutting data page 159

NEW

- without centre cutting
- neck clearance

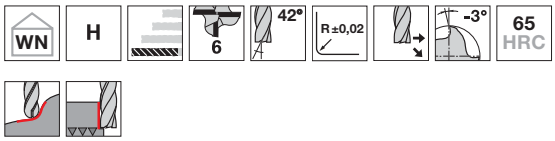




Article no. **6947**

d1 f8	d2 h5	d3	l1	l2	l3	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
3.00	6.00	2.85	57	8.0	12.0	0.10	6	6947 3.001
3.00	6.00	2.85	57	8.0	12.0	0.30	6	6947 3.003
3.00	6.00	2.85	57	8.0	12.0	0.50	6	6947 3.005
4.00	6.00	3.80	57	11.0	15.0	0.20	6	6947 4.002
4.00	6.00	3.80	57	11.0	15.0	0.50	6	6947 4.005
5.00	6.00	4.80	57	13.0	18.0	0.20	6	6947 5.002
5.00	6.00	4.80	57	13.0	18.0	0.50	6	6947 5.005
6.00	6.00	5.70	57	13.0	20.0	0.20	6	6947 6.002
6.00	6.00	5.70	57	13.0	20.0	0.50	6	6947 6.005
6.00	6.00	5.70	57	13.0	20.0	1.00	6	6947 6.010
8.00	8.00	7.70	63	19.0	26.0	0.30	6	6947 8.003
8.00	8.00	7.70	63	19.0	26.0	0.50	6	6947 8.005
8.00	8.00	7.70	63	19.0	26.0	1.00	6	6947 8.010
10.00	10.00	9.50	72	22.0	31.0	0.30	6	6947 10.003
10.00	10.00	9.50	72	22.0	31.0	0.50	6	6947 10.005
10.00	10.00	9.50	72	22.0	31.0	1.00	6	6947 10.010
10.00	10.00	9.50	72	22.0	31.0	1.50	6	6947 10.015
12.00	12.00	11.50	83	26.0	37.0	0.50	6	6947 12.005
12.00	12.00	11.50	83	26.0	37.0	1.00	6	6947 12.010
12.00	12.00	11.50	83	26.0	37.0	1.50	6	6947 12.015
16.00	16.00	15.50	92	32.0	43.0	0.50	6	6947 16.005
16.00	16.00	15.50	92	32.0	43.0	1.00	6	6947 16.010
16.00	16.00	15.50	92	32.0	43.0	2.00	6	6947 16.020

Finishing end mills with corner radius G-Mold 65 FR



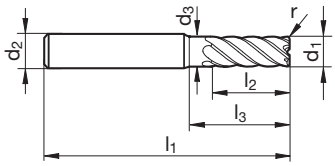
Tool material	**Solid carbide**
Surface	Y
Type	H
Shank form	HA

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 159

- without centre cutting
- neck clearance

NEW

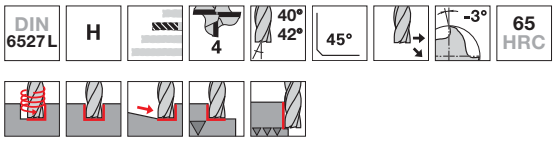




Article no. **6948**

d1 f8	d2 h5	d3	l1	l2	l3	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
3.00	6.00	2.85	75	8.0	25.0	0.20	6	6948 3.002
4.00	6.00	3.80	75	11.0	30.0	0.20	6	6948 4.002
5.00	6.00	4.80	75	13.0	35.0	0.20	6	6948 5.002
6.00	6.00	5.70	80	13.0	42.0	0.50	6	6948 6.005
8.00	8.00	7.70	100	19.0	62.0	0.50	6	6948 8.005
10.00	10.00	9.50	120	22.0	78.0	0.50	6	6948 10.005
12.00	12.00	11.50	150	26.0	101.0	1.00	6	6948 12.010
16.00	16.00	15.50	150	32.0	101.0	1.00	6	6948 16.010

Ratio end mills G-Mold 65 U

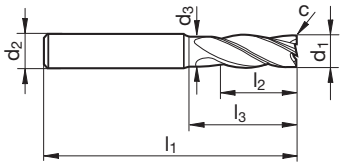


Tool material	Solid carbide	
Surface	Y	Y
Type	H	H
Shank form	HA	HB
	NEW	NEW

P	○
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 157

- slotting up to max. 65 HRC
- neck clearance
- centre cutting







Article no.	6943	6944

d1 f9	d2 h5	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
3.00	6.00	2.85	57	8.0	12.0	0.06	4	6943 3.000	6944 3.000
4.00	6.00	3.80	57	11.0	15.0	0.08	4	6943 4.000	6944 4.000
5.00	6.00	4.80	57	13.0	18.0	0.10	4	6943 5.000	6944 5.000
6.00	6.00	5.70	57	13.0	20.0	0.12	4	6943 6.000	6944 6.000
8.00	8.00	7.70	63	19.0	26.0	0.16	4	6943 8.000	6944 8.000
10.00	10.00	9.50	72	22.0	31.0	0.20	4	6943 10.000	6944 10.000
12.00	12.00	11.50	83	26.0	37.0	0.24	4	6943 12.000	6944 12.000
16.00	16.00	15.50	92	32.0	43.0	0.32	4	6943 16.000	6944 16.000
20.00	20.00	19.50	104	38.0	53.0	0.40	4	6943 20.000	6944 20.000

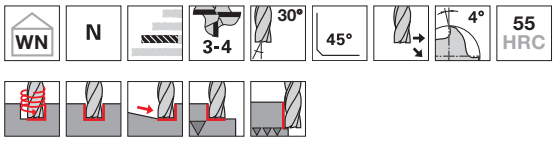
G-Mold µ

from Ø 0.2 – 3 mm with GühroJet peripheral cooling

+ increased service life and process reliability thanks to GühroJet
+ large selection of full and corner radii as well as corner chamfers in up to 5 different lengths
+ top surfaces and accuracies thanks to tight tolerances and precise concentricity



Micro-precision milling cutters MicroMill µ 55



Tool material	Solid carbide
Surface	X
Type	N
Shank form	HA

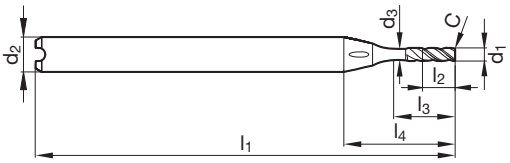
P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR

Cutting data page 157

NEW

- High-precision micro-precision milling cutters with 3 different ranges l3
- with internal cooling: GühroJet peripheral cooling with 6 or 4 exits
- neck clearance
- centre cutting



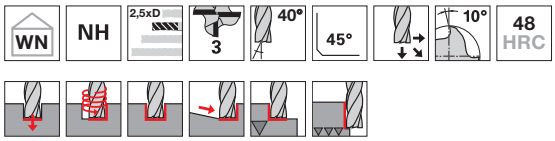


Article no. **6829**

d1 -0,008	d2 h5	d3	l1	l2	l3	l4	c	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm x 45°		
0.20	4.00	0.18	45	0.20	0.40	9.1	0.00	3	6829 0.201
0.20	4.00	0.18	45	0.20	0.75	9.5	0.00	3	6829 0.202
0.20	4.00	0.18	45	0.20	1.00	9.7	0.00	3	6829 0.203
0.25	4.00	0.23	45	0.25	0.50	9.0	0.00	3	6829 0.251
0.25	4.00	0.23	45	0.25	0.90	9.4	0.00	3	6829 0.252
0.25	4.00	0.23	45	0.25	1.25	9.7	0.00	3	6829 0.253
0.30	4.00	0.28	45	0.30	0.60	9.0	0.00	3	6829 0.301
0.30	4.00	0.28	45	0.30	1.10	9.5	0.00	3	6829 0.302
0.30	4.00	0.28	45	0.30	1.50	9.9	0.00	3	6829 0.303
0.40	4.00	0.38	45	0.40	0.80	8.9	0.01	4	6829 0.401
0.40	4.00	0.38	45	0.40	1.40	9.5	0.01	4	6829 0.402
0.40	4.00	0.38	45	0.40	2.00	10.1	0.01	4	6829 0.403
0.50	4.00	0.45	45	0.50	1.00	9.0	0.01	4	6829 0.501
0.50	4.00	0.45	45	0.50	1.80	9.8	0.01	4	6829 0.502
0.50	4.00	0.45	45	0.50	2.50	10.5	0.01	4	6829 0.503
0.60	4.00	0.55	45	0.60	1.20	8.9	0.01	4	6829 0.601
0.60	4.00	0.55	45	0.60	2.10	9.8	0.01	4	6829 0.602
0.60	4.00	0.55	45	0.60	3.00	10.7	0.01	4	6829 0.603
0.80	4.00	0.75	45	0.80	1.60	8.7	0.01	4	6829 0.801
0.80	4.00	0.75	45	0.80	2.80	9.9	0.01	4	6829 0.802
0.80	4.00	0.75	45	0.80	4.00	11.1	0.01	4	6829 0.803
1.00	4.00	0.92	45	1.00	2.00	8.7	0.02	4	6829 1.001
1.00	4.00	0.92	45	1.00	3.50	10.2	0.02	4	6829 1.002
1.00	4.00	0.92	45	1.00	5.00	11.7	0.02	4	6829 1.003
1.20	4.00	1.12	50	1.20	2.40	8.7	0.01	4	6829 1.201
1.20	4.00	1.12	50	1.20	4.20	10.5	0.01	4	6829 1.202
1.20	4.00	1.12	50	1.20	6.00	12.3	0.01	4	6829 1.203
1.50	4.00	1.40	50	1.50	3.00	8.6	0.01	4	6829 1.501
1.50	4.00	1.40	50	1.50	5.50	11.1	0.01	4	6829 1.502
1.50	4.00	1.40	50	1.50	7.50	13.1	0.01	4	6829 1.503
1.80	4.00	1.70	50	1.80	3.60	8.5	0.01	4	6829 1.801
1.80	4.00	1.70	50	1.80	6.50	11.4	0.01	4	6829 1.802
1.80	4.00	1.70	50	1.80	9.00	13.9	0.01	4	6829 1.803
2.00	6.00	1.85	50	2.00	4.00	13.2	0.02	4	6829 2.001
2.00	6.00	1.85	57	2.00	7.50	16.7	0.02	4	6829 2.002
2.00	6.00	1.85	57	2.00	10.00	19.2	0.02	4	6829 2.003

							Article no.	6829
d1 -0,008	d2 h5	d3	l1	l2	l3	l4	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm x 45°		
2.20	6.00	2.05	50	2.20	4.40	13.2	0.02	4	6829 2.201
2.20	6.00	2.05	57	2.20	8.00	16.8	0.02	4	6829 2.202
2.20	6.00	2.05	57	2.20	11.00	19.8	0.02	4	6829 2.203
2.50	6.00	2.35	50	2.50	5.00	13.1	0.02	4	6829 2.501
2.50	6.00	2.35	57	2.50	9.00	17.1	0.02	4	6829 2.502
2.50	6.00	2.35	57	2.50	12.50	20.6	0.02	4	6829 2.503
3.00	6.00	2.85	50	3.00	6.00	12.9	0.03	4	6829 3.001
3.00	6.00	2.85	57	3.00	11.00	17.9	0.03	4	6829 3.002
3.00	6.00	2.85	57	3.00	15.00	21.9	0.03	4	6829 3.003

Ratio end mills RF 100 Microdiver



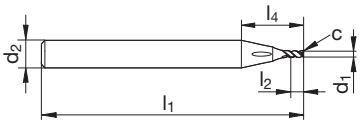
Tool material	**Solid carbide**
Surface	X
Type	NH
Shank form	cyl.

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR

Cutting data page 162-163

- for extreme cutting values and cutting performance
- with internal cooling: GühroJet peripheral cooling with 6 or 4 exits
- centre cutting
- with special drill face

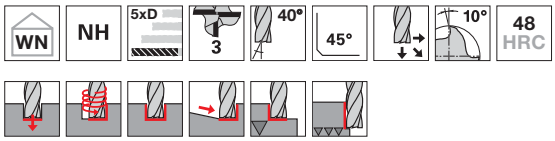




Article no. **6808**

d1 h8	d2 h5	l1	l2	l4	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm x 45°		
0.790	4.00	38	1.9	9.5	0.01	3	6808 0.790
0.800	4.00	38	2.0	9.5	0.01	3	6808 0.800
1.000	4.00	38	2.5	9.3	0.02	3	6808 1.000
1.190	4.00	38	2.9	9.4	0.02	3	6808 1.190
1.200	4.00	38	3.0	9.4	0.02	3	6808 1.200
1.500	4.00	45	3.7	9.7	0.03	3	6808 1.500
1.590	4.00	44	3.9	9.9	0.03	3	6808 1.590
1.800	4.00	45	4.5	10.2	0.03	3	6808 1.800
1.980	6.00	50	4.9	14.7	0.04	3	6808 1.980
2.000	6.00	50	5.0	14.6	0.04	3	6808 2.000
2.200	6.00	50	5.5	14.9	0.04	3	6808 2.200
2.380	6.00	50	5.9	15.2	0.04	3	6808 2.380
2.500	6.00	50	6.2	15.3	0.05	3	6808 2.500
2.780	6.00	50	6.9	15.8	0.05	3	6808 2.780
2.800	6.00	50	7.0	15.9	0.05	3	6808 2.800
3.000	6.00	50	7.5	16.2	0.06	3	6808 3.000
3.175	6.00	50	7.9	17.0	0.06	3	6808 3.175

Ratio end mills RF 100 Microdiver



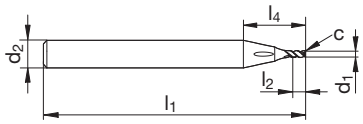
Tool material	**Solid carbide**
Surface	X
Type	NH
Shank form	cyl.

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 164-165

- for extreme cutting values and cutting performance
- with internal cooling: GühroJet peripheral cooling with 6 or 4 exits
- centre cutting
- with special drill face

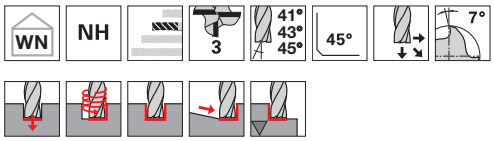




Article no. **6809**

d1 h8	d2 h5	l1	l2	l4	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm x 45°		
1.000	4.00	45	5.0	11.8	0.02	3	6809 1.000
1.190	4.00	50	5.9	12.4	0.02	3	6809 1.190
1.500	4.00	50	7.5	13.5	0.03	3	6809 1.500
1.590	4.00	50	7.9	13.9	0.03	3	6809 1.590
1.980	6.00	57	9.9	19.6	0.04	3	6809 1.980
2.000	6.00	57	10.0	19.6	0.04	3	6809 2.000
2.380	6.00	57	11.9	21.1	0.04	3	6809 2.380
2.500	6.00	57	12.5	21.5	0.05	3	6809 2.500
2.780	6.00	57	13.9	22.8	0.05	3	6809 2.780
3.000	6.00	57	15.0	23.7	0.06	3	6809 3.000
3.175	6.00	57	15.8	25.0	0.06	3	6809 3.175

Ratio end mills RF 100 Diver (3-fluted)

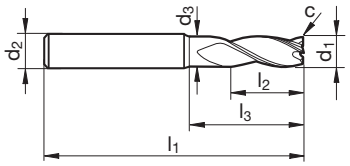


Tool material	Solid carbide	
Surface	Y	Y
Type	NH	NH
Shank form	HA	HB

P	•
M	•
K	•
N	•
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 154

- neck clearance
- centre cutting
- with special drill face



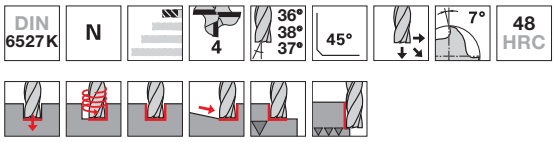




Article no.	6797	6798

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
3.00	6.00	2.80	57	8.0	15.0	0.05	3	6797 3.000	6798 3.000
3.50	6.00	3.30	57	10.0	15.0	0.05	3	6797 3.500	6798 3.500
3.70	6.00	3.50	57	11.0	15.0	0.06	3	6797 3.700	6798 3.700
4.00	6.00	3.80	57	11.0	18.0	0.06	3	6797 4.000	6798 4.000
4.50	6.00	4.30	57	11.0	18.0	0.07	3	6797 4.500	6798 4.500
4.70	6.00	4.50	57	13.0	18.0	0.07	3	6797 4.700	6798 4.700
5.00	6.00	4.80	57	13.0	18.0	0.08	3	6797 5.000	6798 5.000
5.50	6.00	5.30	57	13.0	19.4	0.08	3	6797 5.500	6798 5.500
5.70	6.00	5.50	57	13.0	19.6	0.09	3	6797 5.700	6798 5.700
6.00	6.00	5.70	57	13.0	20.0	0.09	3	6797 6.000	6798 6.000
6.50	8.00	6.20	63	16.0	24.4	0.10	3	6797 6.500	6798 6.500
7.00	8.00	6.70	63	16.0	24.9	0.11	3	6797 7.000	6798 7.000
7.50	8.00	7.20	63	19.0	25.3	0.11	3	6797 7.500	6798 7.500
8.00	8.00	7.70	63	19.0	26.0	0.12	3	6797 8.000	6798 8.000
8.50	10.00	8.20	72	19.0	29.4	0.13	3	6797 8.500	6798 8.500
9.00	10.00	8.70	72	19.0	29.9	0.14	3	6797 9.000	6798 9.000
9.50	10.00	9.20	72	22.0	30.3	0.14	3	6797 9.500	6798 9.500
10.00	10.00	9.50	72	22.0	30.0	0.15	3	6797 10.000	6798 10.000
12.00	12.00	11.50	83	26.0	36.0	0.18	3	6797 12.000	6798 12.000
16.00	16.00	15.50	92	32.0	42.0	0.19	3	6797 16.000	6798 16.000
20.00	20.00	19.50	104	38.0	52.0	0.24	3	6797 20.000	6798 20.000

Ratio end mills RF 100 Diver

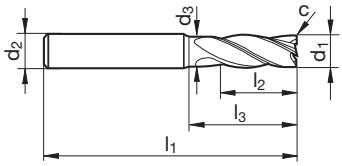


Tool material	Solid carbide	
Surface	Y	Y
Type	N	N
Shank form	HA	HB

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 154

- neck clearance
- centre cutting







Article no.	6803	6804

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
3.00	6.00	2.80	50	5.0	12.0	0.03	4	6803 3.000	6804 3.000
3.70	6.00	3.50	54	8.0	12.0	0.04	4	6803 3.700	6804 3.700
4.00	6.00	3.80	54	8.0	15.0	0.04	4	6803 4.000	6804 4.000
4.70	6.00	4.50	54	9.0	15.0	0.05	4	6803 4.700	6804 4.700
5.00	6.00	4.80	54	9.0	15.0	0.05	4	6803 5.000	6804 5.000
5.70	6.00	5.50	54	10.0	16.6	0.06	4	6803 5.700	6804 5.700
6.00	6.00	5.70	54	10.0	17.0	0.06	4	6803 6.000	6804 6.000
7.00	8.00	6.70	58	11.0	19.9	0.07	4	6803 7.000	6804 7.000
7.70	8.00	7.40	58	12.0	20.5	0.08	4	6803 7.700	6804 7.700
8.00	8.00	7.70	58	12.0	21.0	0.08	4	6803 8.000	6804 8.000
9.00	10.00	8.70	66	13.0	23.9	0.09	4	6803 9.000	6804 9.000
9.70	10.00	9.40	66	14.0	24.5	0.10	4	6803 9.700	6804 9.700
10.00	10.00	9.50	66	14.0	24.0	0.10	4	6803 10.000	6804 10.000
11.70	12.00	11.20	73	16.0	25.3	0.12	4	6803 11.700	6804 11.700
12.00	12.00	11.50	73	16.0	26.0	0.12	4	6803 12.000	6804 12.000
15.60	16.00	15.10	82	22.0	31.2	0.16	4	6803 15.600	6804 15.600
16.00	16.00	15.50	82	22.0	32.0	0.16	4	6803 16.000	6804 16.000
19.00	20.00	18.50	92	26.0	38.7	0.19	4	6803 19.000	6804 19.000
20.00	20.00	19.50	92	26.0	40.0	0.20	4	6803 20.000	6804 20.000

Ratio end mills RF 100 Diver

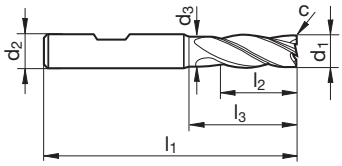
DIN 6527 L | NH | 4 | 36° 38° 37° | 45° | 7° | 48 HRC

Tool material	Solid carbide	
Surface	Y	Y
Type	NH	NH
Shank form	HB	HA
	GTC	GTC

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 154

• neck clearance
• centre cutting



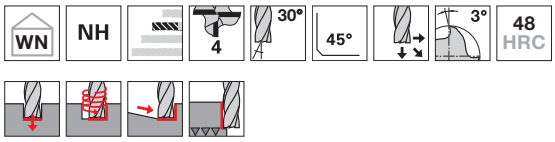




Article no.	6736	6737

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
4.00	6.00	3.80	57	11.0	18.0	0.04	4	6736 4.000	6737 4.000
5.00	6.00	4.80	57	13.0	18.0	0.05	4	6736 5.000	6737 5.000
5.70	6.00	5.50	57	13.0	19.6	0.06	4	6736 5.700	6737 5.700
6.00	6.00	5.70	57	13.0	20.0	0.06	4	6736 6.000	6737 6.000
7.70	8.00	7.40	63	19.0	25.5	0.08	4	6736 7.700	6737 7.700
8.00	8.00	7.70	63	19.0	26.0	0.08	4	6736 8.000	6737 8.000
9.70	10.00	9.40	72	22.0	30.5	0.10	4	6736 9.700	6737 9.700
10.00	10.00	9.50	72	22.0	30.0	0.10	4	6736 10.000	6737 10.000
11.70	12.00	11.20	83	26.0	35.3	0.12	4	6736 11.700	6737 11.700
12.00	12.00	11.50	83	26.0	36.0	0.12	4	6736 12.000	6737 12.000
13.70	14.00	13.20	83	26.0	35.3	0.14	4	6736 13.700	6737 13.700
14.00	14.00	13.50	83	26.0	36.0	0.14	4	6736 14.000	6737 14.000
15.60	16.00	15.10	92	32.0	41.2	0.16	4	6736 15.600	6737 15.600
16.00	16.00	15.50	92	32.0	42.0	0.16	4	6736 16.000	6737 16.000
19.50	20.00	19.00	104	38.0	51.1	0.20	4	6736 19.500	6737 19.500
20.00	20.00	19.50	104	38.0	52.0	0.20	4	6736 20.000	6737 20.000

Pilot end mills RF 100 P



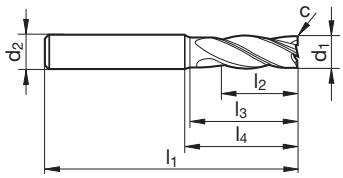
Tool material	**Solid carbide**
Surface	A
Type	NH
Shank form	HA

P	•
M	○
K	•
N	•
S	○
H	○

GÜHRINGNAVIGATOR

Cutting data page 161

- for piloting, drilling, finishing
- adapted diameter tolerance m8 for solid carbide drills
- special pilot geometry
- centre cutting

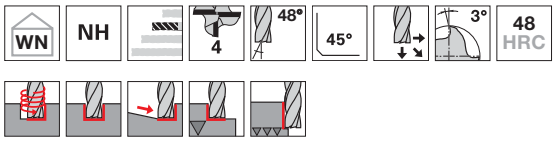




Article no. **6716**

d1 m8	d2 h6	l1	l2	l3	l4	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm x 45°		
1.40	3.00	38	3.0	5.9	10.0	0.01	4	6716 1.400
1.50	3.00	38	4.0	6.9	10.0	0.02	4	6716 1.500
1.80	3.00	38	6.0	8.9	10.0	0.02	4	6716 1.800
2.00	3.00	38	6.5	9.4	10.0	0.02	4	6716 2.000
2.10	3.00	38	6.5	9.9	10.0	0.02	4	6716 2.100
2.30	3.00	38	6.5	9.9	10.0	0.02	4	6716 2.300
2.50	3.00	38	6.5	9.9	10.0	0.03	4	6716 2.500
2.80	3.00	38	6.5	10.0	10.0	0.03	4	6716 2.800
3.00	6.00	57	8.0	12.4	21.0	0.03	4	6716 3.000
3.50	6.00	57	10.0	14.9	21.0	0.04	4	6716 3.500
4.00	6.00	57	11.0	15.9	21.0	0.04	4	6716 4.000
4.50	6.00	57	11.0	17.4	21.0	0.05	4	6716 4.500
5.00	6.00	57	13.0	19.4	21.0	0.05	4	6716 5.000
5.50	6.00	57	13.0	20.4	21.0	0.06	4	6716 5.500
6.00	8.00	63	13.0	20.4	27.0	0.06	4	6716 6.000
6.50	8.00	63	13.0	20.9	27.0	0.07	4	6716 6.500
7.00	8.00	63	16.0	23.9	27.0	0.07	4	6716 7.000
7.50	8.00	63	16.0	23.9	27.0	0.08	4	6716 7.500
8.00	10.00	72	19.0	26.9	32.0	0.08	4	6716 8.000
8.50	10.00	72	19.0	28.4	32.0	0.09	4	6716 8.500
9.00	10.00	72	19.0	28.4	32.0	0.09	4	6716 9.000
10.00	12.00	83	22.0	31.4	38.0	0.10	4	6716 10.000
11.00	12.00	83	26.0	36.4	38.0	0.11	4	6716 11.000
12.00	14.00	83	26.0	37.4	38.0	0.12	4	6716 12.000

Ratio end mills RF 100 Speed P

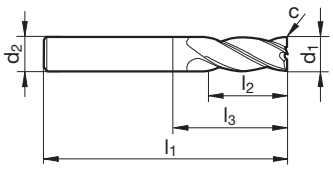


Tool material	Solid carbide	
Surface	A	A
Type	NH	NH
Shank form	HA	HB

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR
Cutting data page 155

- with chip breaker
- slotting operations of up to max. 0.8xD depth
- re-inforced core from Ø 6 mm
- centre cutting



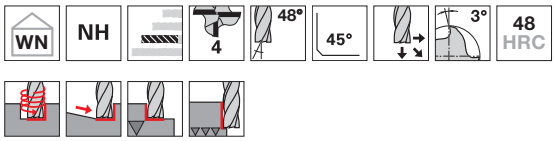




Article no.	6958	6959

d1 h10	d2 h6	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	57	15.0	21.0	0.12	4	6958 6.000	6959 6.000
8.00	8.00	63	20.0	27.0	0.16	4	6958 8.000	6959 8.000
10.00	10.00	72	24.0	32.0	0.20	4	6958 10.000	6959 10.000
12.00	12.00	83	28.0	38.0	0.24	4	6958 12.000	6959 12.000
16.00	16.00	92	36.0	44.0	0.32	4	6958 16.000	6959 16.000
20.00	20.00	104	45.0	54.0	0.40	4	6958 20.000	6959 20.000
25.00	25.00	121	55.0	65.0	0.50	4	6958 25.000	6959 25.000

Ratio end mills RF 100 Speed P

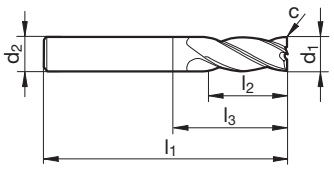


Tool material	Solid carbide	
Surface	A	A
Type	NH	NH
Shank form	HA	HB
	GTC	GTC

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR
Cutting data page 155

- with chip breaker
- re-inforced core from Ø 6 mm
- centre cutting





Article no.	6960	6961

d1 h10	d2 h6	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	65	24.0	29.0	0.12	4	6960 6.000	6961 6.000
8.00	8.00	75	32.0	39.0	0.16	4	6960 8.000	6961 8.000
10.00	10.00	90	40.0	50.0	0.20	4	6960 10.000	6961 10.000
12.00	12.00	100	46.0	55.0	0.24	4	6960 12.000	6961 12.000
16.00	16.00	108	55.0	60.0	0.32	4	6960 16.000	6961 16.000
20.00	20.00	126	65.0	76.0	0.40	4	6960 20.000	6961 20.000
25.00	25.00	150	85.0	94.0	0.50	4	6960 25.000	6961 25.000

RF 100 Speed P

for tool steels



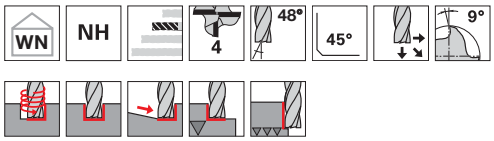
+ highest removal rates with GTC strategy

+ short chips for high process reliability

+ High-performance roughing even at high cutting depths

RF 100 SPEED

Ratio end mills RF 100 Speed M

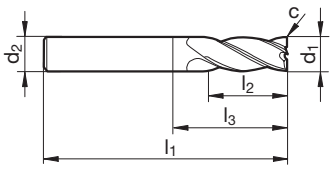


Tool material	Solid carbide	
Surface	A	A
Type	NH	NH
Shank form	HA	HB
	GTC	GTC

P	•
M	•
K	
N	
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 155

- slotting operations of up to max. 0.8xD depth
- re-inforced core from Ø 6 mm
- centre cutting



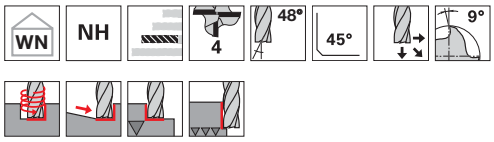




Article no.	6765	6760

d1 h10	d2 h6	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm x 45°			
3.00	6.00	57	8.0	10.9	0.04	4	6765 3.000	6760 3.000
4.00	6.00	57	11.0	13.9	0.06	4	6765 4.000	6760 4.000
5.00	6.00	57	13.0	15.9	0.07	4	6765 5.000	6760 5.000
6.00	6.00	57	15.0	21.0	0.12	4	6765 6.000	6760 6.000
8.00	8.00	63	20.0	27.0	0.16	4	6765 8.000	6760 8.000
10.00	10.00	72	24.0	32.0	0.20	4	6765 10.000	6760 10.000
12.00	12.00	83	28.0	38.0	0.24	4	6765 12.000	6760 12.000
16.00	16.00	92	36.0	44.0	0.32	4	6765 16.000	6760 16.000
20.00	20.00	104	45.0	54.0	0.40	4	6765 20.000	6760 20.000

Ratio end mills RF 100 Speed M

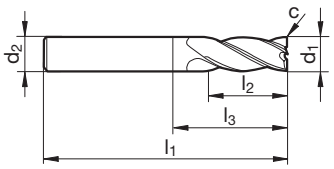


Tool material	Solid carbide	
Surface	A	A
Type	NH	NH
Shank form	HA	HB
	GTC	GTC

P	•
M	•
K	
N	
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 155

- with chip breaker
- re-inforced core from Ø 6 mm
- centre cutting

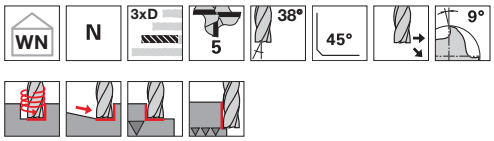




Article no.	6766	6761

d1 h10	d2 h6	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm x 45°			
3.00	6.00	57	12.0	14.9	0.04	4	6766 3.000	6761 3.000
4.00	6.00	65	16.0	18.9	0.06	4	6766 4.000	6761 4.000
5.00	6.00	65	20.0	22.9	0.07	4	6766 5.000	6761 5.000
6.00	6.00	65	24.0	29.0	0.12	4	6766 6.000	6761 6.000
8.00	8.00	75	32.0	39.0	0.16	4	6766 8.000	6761 8.000
10.00	10.00	90	40.0	50.0	0.20	4	6766 10.000	6761 10.000
12.00	12.00	100	46.0	55.0	0.24	4	6766 12.000	6761 12.000
16.00	16.00	108	55.0	60.0	0.32	4	6766 16.000	6761 16.000
20.00	20.00	126	65.0	76.0	0.40	4	6766 20.000	6761 20.000

Ratio end mills RF 100 5 Speed

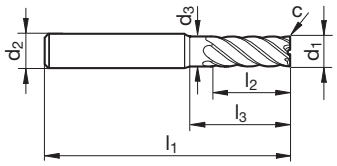


P	•	
M	•	
K	•	
N	○	
S	•	
H		

GÜHRINGNAVIGATOR
Cutting data page 155

- with chip breaker
- neck clearance
- without centre cutting

Tool material	Solid carbide	
Surface	A	A
Type	N	N
Shank form	HA	HB
	GTC	GTC

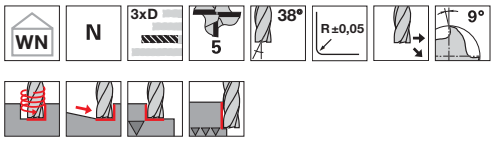




Article no.	6858	6859

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	65	20.0	28.0	0.12	5	6858 6.000	6859 6.000
8.00	8.00	7.70	75	26.0	38.0	0.16	5	6858 8.000	6859 8.000
10.00	10.00	9.50	80	32.0	38.0	0.20	5	6858 10.000	6859 10.000
12.00	12.00	11.50	93	40.0	46.0	0.24	5	6858 12.000	6859 12.000
16.00	16.00	15.50	108	50.0	58.0	0.32	5	6858 16.000	6859 16.000
20.00	20.00	19.50	126	62.0	74.0	0.40	5	6858 20.000	6859 20.000

Ratio end mills RF 100 5 Speed



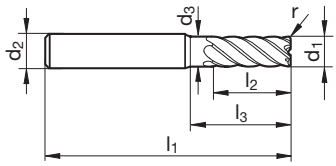
Tool material	Solid carbide	
Surface	A	A
Type	N	N
Shank form	HA	HB

P	•
M	•
K	•
N	○
S	•
H	

GÜHRINGNAVIGATOR

Cutting data page 155

- with chip breaker
- neck clearance
- without centre cutting





Article no.	6860	6861

d1 h10	d2 h6	d3	l1	l2	l3	r	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm			
6.00	6.00	5.70	65	20.0	28.0	0.20	5	6860 6.002	6861 6.002
6.00	6.00	5.70	65	20.0	28.0	0.50	5	6860 6.005	6861 6.005
6.00	6.00	5.70	65	20.0	28.0	1.00	5	6860 6.010	6861 6.010
8.00	8.00	7.70	75	26.0	38.0	0.30	5	6860 8.003	6861 8.003
8.00	8.00	7.70	75	26.0	38.0	0.50	5	6860 8.005	6861 8.005
8.00	8.00	7.70	75	26.0	38.0	1.00	5	6860 8.010	6861 8.010
8.00	8.00	7.70	75	26.0	38.0	1.50	5	6860 8.015	6861 8.015
10.00	10.00	9.50	80	32.0	38.0	0.50	5	6860 10.005	6861 10.005
10.00	10.00	9.50	80	32.0	38.0	1.00	5	6860 10.010	6861 10.010
10.00	10.00	9.50	80	32.0	38.0	1.50	5	6860 10.015	6861 10.015
10.00	10.00	9.50	80	32.0	38.0	2.00	5	6860 10.020	6861 10.020
12.00	12.00	11.50	93	40.0	46.0	0.50	5	6860 12.005	6861 12.005
12.00	12.00	11.50	93	40.0	46.0	1.00	5	6860 12.010	6861 12.010
12.00	12.00	11.50	93	40.0	46.0	1.50	5	6860 12.015	6861 12.015
12.00	12.00	11.50	93	40.0	46.0	2.00	5	6860 12.020	6861 12.020
16.00	16.00	15.50	108	50.0	58.0	0.50	5	6860 16.005	6861 16.005
16.00	16.00	15.50	108	50.0	58.0	1.00	5	6860 16.010	6861 16.010
16.00	16.00	15.50	108	50.0	58.0	1.50	5	6860 16.015	6861 16.015
16.00	16.00	15.50	108	50.0	58.0	2.00	5	6860 16.020	6861 16.020
16.00	16.00	15.50	108	50.0	58.0	3.00	5	6860 16.030	6861 16.030
20.00	20.00	19.50	126	62.0	74.0	1.00	5	6860 20.010	6861 20.010
20.00	20.00	19.50	126	62.0	74.0	1.50	5	6860 20.015	6861 20.015
20.00	20.00	19.50	126	62.0	74.0	2.00	5	6860 20.020	6861 20.020
20.00	20.00	19.50	126	62.0	74.0	3.00	5	6860 20.030	6861 20.030

Ratio end mills RF 100 Sharp

DIN 6527 L | N | 4 | 38° 40° | R±0,05 | 12°

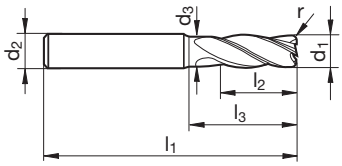
Tool material	Solid carbide	
Surface	Y	Y
Type	N	N
Shank form	HA	HB

P	○
M	•
K	
N	•
S	•
H	

GÜHRINGNAVIGATOR

Cutting data page 157

- neck clearance
- centre cutting



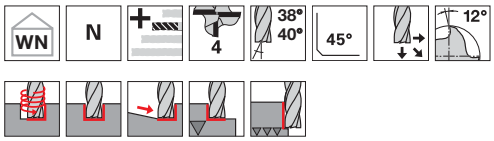




d1 e8	d2 h6	d3	l1	l2	l3	r	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm			
Article no.								6964	6965
3.00	6.00	2.80	57	8.0	15.0	0.20	4	6964 3.002	6965 3.002
3.00	6.00	2.80	57	8.0	15.0	0.50	4	6964 3.005	6965 3.005
4.00	6.00	3.80	57	11.0	18.0	0.20	4	6964 4.002	6965 4.002
4.00	6.00	3.80	57	11.0	18.0	0.50	4	6964 4.005	6965 4.005
4.00	6.00	3.80	57	11.0	18.0	1.00	4	6964 4.010	6965 4.010
5.00	6.00	4.80	57	13.0	18.0	0.20	4	6964 5.002	6965 5.002
5.00	6.00	4.80	57	13.0	18.0	0.50	4	6964 5.005	6965 5.005
5.00	6.00	4.80	57	13.0	18.0	1.00	4	6964 5.010	6965 5.010
6.00	6.00	5.70	57	13.0	20.0	0.20	4	6964 6.002	6965 6.002
6.00	6.00	5.70	57	13.0	20.0	0.50	4	6964 6.005	6965 6.005
6.00	6.00	5.70	57	13.0	20.0	1.00	4	6964 6.010	6965 6.010
6.00	6.00	5.70	57	13.0	20.0	1.50	4	6964 6.015	6965 6.015
8.00	8.00	7.70	63	19.0	26.0	0.30	4	6964 8.003	6965 8.003
8.00	8.00	7.70	63	19.0	26.0	0.50	4	6964 8.005	6965 8.005
8.00	8.00	7.70	63	19.0	26.0	1.00	4	6964 8.010	6965 8.010
8.00	8.00	7.70	63	19.0	26.0	1.50	4	6964 8.015	6965 8.015
8.00	8.00	7.70	63	19.0	26.0	2.00	4	6964 8.020	6965 8.020
10.00	10.00	9.50	72	22.0	30.0	0.30	4	6964 10.003	6965 10.003
10.00	10.00	9.50	72	22.0	30.0	0.50	4	6964 10.005	6965 10.005
10.00	10.00	9.50	72	22.0	30.0	1.00	4	6964 10.010	6965 10.010
10.00	10.00	9.50	72	22.0	30.0	1.50	4	6964 10.015	6965 10.015
10.00	10.00	9.50	72	22.0	30.0	2.00	4	6964 10.020	6965 10.020
10.00	10.00	9.50	72	22.0	30.0	2.50	4	6964 10.025	6965 10.025
12.00	12.00	11.50	83	26.0	36.0	0.30	4	6964 12.003	6965 12.003
12.00	12.00	11.50	83	26.0	36.0	0.50	4	6964 12.005	6965 12.005
12.00	12.00	11.50	83	26.0	36.0	1.00	4	6964 12.010	6965 12.010
12.00	12.00	11.50	83	26.0	36.0	1.50	4	6964 12.015	6965 12.015
12.00	12.00	11.50	83	26.0	36.0	2.00	4	6964 12.020	6965 12.020
12.00	12.00	11.50	83	26.0	36.0	2.50	4	6964 12.025	6965 12.025
12.00	12.00	11.50	83	26.0	36.0	3.00	4	6964 12.030	6965 12.030
16.00	16.00	15.50	92	32.0	42.0	0.50	4	6964 16.005	6965 16.005
16.00	16.00	15.50	92	32.0	42.0	1.00	4	6964 16.010	6965 16.010
16.00	16.00	15.50	92	32.0	42.0	1.50	4	6964 16.015	6965 16.015
16.00	16.00	15.50	92	32.0	42.0	2.00	4	6964 16.020	6965 16.020
16.00	16.00	15.50	92	32.0	42.0	2.50	4	6964 16.025	6965 16.025
16.00	16.00	15.50	92	32.0	42.0	3.00	4	6964 16.030	6965 16.030

							Article no.	6964	6965
d1 e8	d2 h6	d3	l1	l2	l3	r	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm			
16.00	16.00	15.50	92	32.0	42.0	4.00	4	6964 16.040	6965 16.040
20.00	20.00	19.50	104	38.0	52.0	0.50	4	6964 20.005	6965 20.005
20.00	20.00	19.50	104	38.0	52.0	1.00	4	6964 20.010	6965 20.010
20.00	20.00	19.50	104	38.0	52.0	1.50	4	6964 20.015	6965 20.015
20.00	20.00	19.50	104	38.0	52.0	2.00	4	6964 20.020	6965 20.020
20.00	20.00	19.50	104	38.0	52.0	2.50	4	6964 20.025	6965 20.025
20.00	20.00	19.50	104	38.0	52.0	3.00	4	6964 20.030	6965 20.030
20.00	20.00	19.50	104	38.0	52.0	4.00	4	6964 20.040	6965 20.040

Ratio end mills RF 100 Sharp

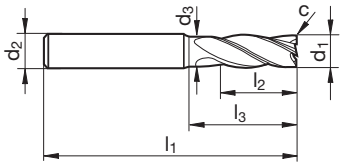


Tool material	Solid carbide	
Surface	P	P
Type	N	N
Shank form	HA	HB
	NEW	NEW

P	•
M	•
K	
N	•
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 156

- especially for soft, tough and high-alloyed materials
- longer cutting edge than DIN 6527 L
- neck clearance
- centre cutting



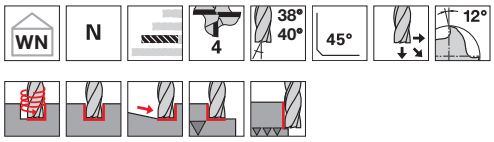




Article no.	6478	6479

d1 e8	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
1.00	4.00	0.92	50	3.0	4.0	0.02	4	6478 1.000	
1.50	4.00	1.40	50	4.5	6.0	0.03	4	6478 1.500	
2.00	6.00	1.85	50	6.0	8.0	0.04	4	6478 2.000	
2.50	6.00	2.35	50	7.5	10.0	0.05	4	6478 2.500	
3.00	6.00	2.85	57	10.0	15.0	0.06	4	6478 3.000	
4.00	6.00	3.80	57	14.0	18.0	0.08	4	6478 4.000	6479 4.000
5.00	6.00	4.80	57	15.0	20.0	0.10	4	6478 5.000	6479 5.000
6.00	6.00	5.70	57	16.0	20.0	0.12	4	6478 6.000	6479 6.000
8.00	8.00	7.70	63	21.0	26.0	0.16	4	6478 8.000	6479 8.000
10.00	10.00	9.50	72	25.0	31.0	0.20	4	6478 10.000	6479 10.000
12.00	12.00	11.50	83	28.0	37.0	0.24	4	6478 12.000	6479 12.000
14.00	14.00	13.50	83	28.0	37.0	0.28	4	6478 14.000	6479 14.000
16.00	16.00	15.50	92	36.0	43.0	0.32	4	6478 16.000	6479 16.000
20.00	20.00	19.50	104	41.0	53.0	0.40	4	6478 20.000	6479 20.000

Ratio end mills RF 100 Sharp

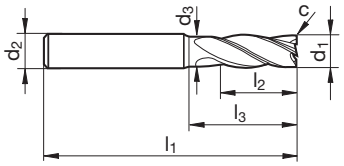


Tool material	Solid carbide	
Surface	P	P
Type	N	N
Shank form	HA	HB
	NEW	NEW

P	•
M	•
K	
N	•
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 156

- especially for soft, tough and high-alloyed materials
- medium length version
- neck clearance
- centre cutting



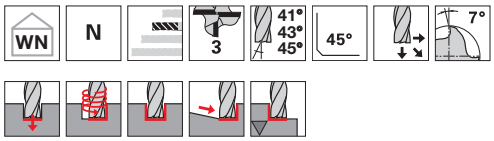




Article no.	6480	6481

d1 e8	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
1.00	4.00	0.92	50	3.0	5.5	0.02	4	6480 1.000	
1.50	4.00	1.40	50	4.5	8.5	0.03	4	6480 1.500	
2.00	6.00	1.85	57	6.0	11.5	0.04	4	6480 2.000	
2.50	6.00	2.35	57	7.5	14.5	0.05	4	6480 2.500	
3.00	6.00	2.85	65	10.0	20.0	0.06	4	6480 3.000	
4.00	6.00	3.80	65	14.0	27.0	0.08	4	6480 4.000	6481 4.000
5.00	6.00	4.80	65	15.0	28.0	0.10	4	6480 5.000	6481 5.000
6.00	6.00	5.70	75	19.0	38.0	0.12	4	6480 6.000	6481 6.000
8.00	8.00	7.70	80	21.0	43.0	0.16	4	6480 8.000	6481 8.000
10.00	10.00	9.50	93	26.0	52.0	0.20	4	6480 10.000	6481 10.000
12.00	12.00	11.50	100	28.0	54.0	0.24	4	6480 12.000	6481 12.000
14.00	14.00	13.50	100	28.0	54.0	0.28	4	6480 14.000	6481 14.000
16.00	16.00	15.50	123	38.0	74.0	0.32	4	6480 16.000	6481 16.000
20.00	20.00	19.50	126	41.0	75.0	0.40	4	6480 20.000	6481 20.000

Standard Ratio end mills RF 100 U (3-fluted)

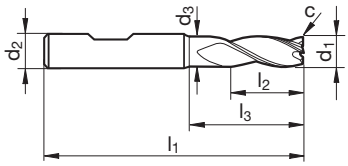


Tool material	**Solid carbide**
Surface	R
Type	N
Shank form	HB

P	•
M	•
K	
N	•
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 157

- Raptor coating
- neck clearance
- centre cutting

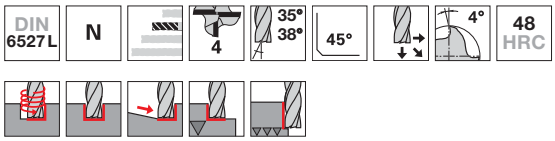




Article no. **6728**

d1 e8	d2 h6	d3	l1	l2	l3	c	Z	Order no.
mm	mm	mm	mm	mm	mm	mm x 45°		
3.00	6.00	2.80	57	8.0	15.0	0.05	3	6728 3.000
4.00	6.00	3.80	57	11.0	18.0	0.06	3	6728 4.000
6.00	6.00	5.70	57	13.0	20.0	0.09	3	6728 6.000
8.00	8.00	7.70	63	19.0	26.0	0.12	3	6728 8.000
10.00	10.00	9.50	72	22.0	30.0	0.15	3	6728 10.000
12.00	12.00	11.50	83	26.0	36.0	0.18	3	6728 12.000
16.00	16.00	15.50	92	32.0	42.0	0.19	3	6728 16.000
20.00	20.00	19.50	104	38.0	52.0	0.24	3	6728 20.000

Standard Ratio end mills RF 100 U

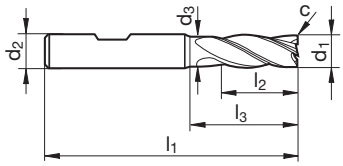


Tool material	**Solid carbide**
Surface	R
Type	N
Shank form	HB

P	•
M	○
K	
N	
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 157

- Raptor coating
- neck clearance
- centre cutting

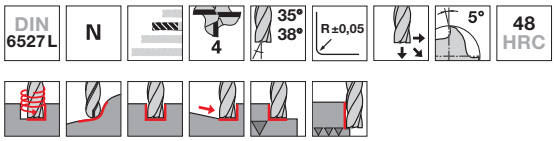




Article no. **6726**

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.
mm	mm	mm	mm	mm	mm	mm x 45°		
6.00	6.00	5.70	57	13.0	20.0	0.10	4	6726 6.000
8.00	8.00	7.70	63	19.0	26.0	0.15	4	6726 8.000
10.00	10.00	9.50	72	22.0	30.0	0.20	4	6726 10.000
12.00	12.00	11.50	83	26.0	36.0	0.20	4	6726 12.000
16.00	16.00	15.50	92	32.0	42.0	0.35	4	6726 16.000
20.00	20.00	19.50	104	38.0	52.0	0.45	4	6726 20.000

Standard Ratio end mills RF 100 U



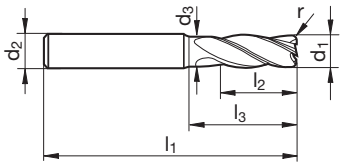
Tool material	Solid carbide	
Surface	F	F
Type	N	N
Shank form	HA	HB

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR

Cutting data page 157

- re-inforced core
- neck clearance
- centre cutting



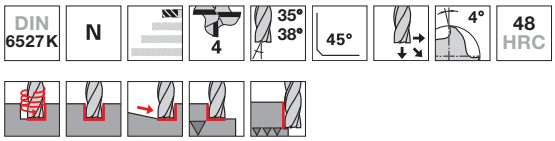




Article no.	3872	3873

d1 h10	d2 h6	d3	l1	l2	l3	r	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm			
6.00	6.00	5.70	57	13.0	20.0	0.50	4	3872 6.005	3873 6.005
6.00	6.00	5.70	57	13.0	20.0	1.00	4	3872 6.010	3873 6.010
6.00	6.00	5.70	57	13.0	20.0	2.00	4	3872 6.020	3873 6.020
8.00	8.00	7.70	63	19.0	26.0	0.50	4	3872 8.005	3873 8.005
8.00	8.00	7.70	63	19.0	26.0	1.00	4	3872 8.010	3873 8.010
8.00	8.00	7.70	63	19.0	26.0	2.00	4	3872 8.020	3873 8.020
10.00	10.00	9.50	72	22.0	30.0	0.50	4	3872 10.005	3873 10.005
10.00	10.00	9.50	72	22.0	30.0	1.00	4	3872 10.010	3873 10.010
10.00	10.00	9.50	72	22.0	30.0	2.00	4	3872 10.020	3873 10.020
12.00	12.00	11.50	83	26.0	36.0	0.50	4	3872 12.005	3873 12.005
12.00	12.00	11.50	83	26.0	36.0	1.00	4	3872 12.010	3873 12.010
12.00	12.00	11.50	83	26.0	36.0	2.00	4	3872 12.020	3873 12.020
16.00	16.00	15.50	92	32.0	42.0	0.50	4	3872 16.005	3873 16.005
16.00	16.00	15.50	92	32.0	42.0	1.00	4	3872 16.010	3873 16.010
16.00	16.00	15.50	92	32.0	42.0	2.00	4	3872 16.020	3873 16.020
16.00	16.00	15.50	92	32.0	42.0	3.00	4	3872 16.030	3873 16.030
20.00	20.00	19.50	104	38.0	52.0	0.50	4	3872 20.005	3873 20.005
20.00	20.00	19.50	104	38.0	52.0	1.00	4	3872 20.010	3873 20.010
20.00	20.00	19.50	104	38.0	52.0	2.00	4	3872 20.020	3873 20.020
20.00	20.00	19.50	104	38.0	52.0	3.00	4	3872 20.030	3873 20.030
25.00	25.00	24.00	121	45.0	63.0	2.00	4	3872 25.020	3873 25.020
25.00	25.00	24.00	121	45.0	63.0	3.00	4	3872 25.030	3873 25.030

Standard Ratio end mills RF 100 U

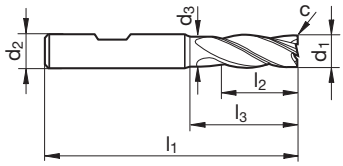


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	HB

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR
Cutting data page 157

- neck clearance
- centre cutting





Article no. **5534**

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.
mm	mm	mm	mm	mm	mm	mm x 45°		
6.00	6.00	5.70	54	10.0	17.0	0.15	4	5534 6.000
8.00	8.00	7.70	58	12.0	21.0	0.15	4	5534 8.000
10.00	10.00	9.50	66	14.0	24.0	0.20	4	5534 10.000
12.00	12.00	11.50	73	16.0	26.0	0.20	4	5534 12.000
14.00	14.00	13.50	75	18.0	28.0	0.25	4	5534 14.000
16.00	16.00	15.50	82	22.0	32.0	0.35	4	5534 16.000
18.00	18.00	17.50	84	24.0	34.0	0.40	4	5534 18.000
20.00	20.00	19.50	92	26.0	40.0	0.45	4	5534 20.000

Standard Ratio end mills RF 100 U

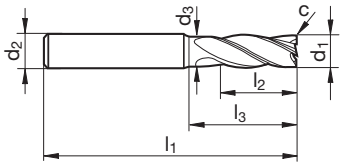
DIN 6527 L | N | 4 | 35° 38° | 45° | 4° | 48 HRC

Tool material	Solid carbide	
Surface	F	F
Type	N	N
Shank form	HA	HB

P	•
M	
K	•
N	
S	
H	○

GÜHRING NAVIGATOR
Cutting data page 157

- neck clearance
- centre cutting



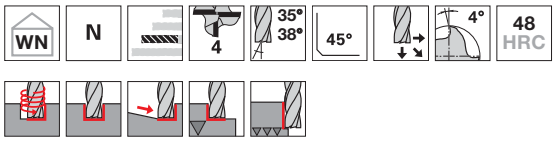




Article no.	5735	5535

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
4.00	6.00	3.80	57	11.0	18.0	0.10	4	5735 4.000	5535 4.000
5.00	6.00	4.80	57	13.0	18.0	0.10	4	5735 5.000	5535 5.000
6.00	6.00	5.70	57	13.0	20.0	0.10	4	5735 6.000	5535 6.000
8.00	8.00	7.70	63	19.0	26.0	0.15	4	5735 8.000	5535 8.000
10.00	10.00	9.50	72	22.0	30.0	0.20	4	5735 10.000	5535 10.000
12.00	12.00	11.50	83	26.0	36.0	0.20	4	5735 12.000	5535 12.000
14.00	14.00	13.50	83	26.0	36.0	0.25	4	5735 14.000	5535 14.000
16.00	16.00	15.50	92	32.0	42.0	0.35	4	5735 16.000	5535 16.000
18.00	18.00	17.50	92	32.0	42.0	0.40	4	5735 18.000	5535 18.000
20.00	20.00	19.50	104	38.0	52.0	0.45	4	5735 20.000	5535 20.000
25.00	25.00	24.00	121	45.0	63.0	0.60	4	5735 25.000	5535 25.000

Standard Ratio end mills RF 100 U

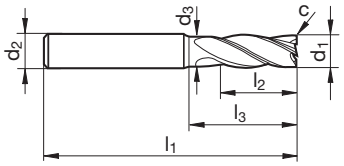


Tool material	Solid carbide	
Surface	F	F
Type	N	N
Shank form	HA	HB
	GTC	GTC

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR
Cutting data page 157

- neck clearance
- centre cutting



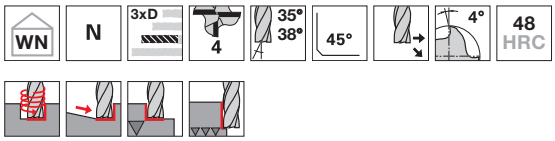




Article no.	3837	3838

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	65	13.0	28.0	0.10	4	3837 6.000	3838 6.000
8.00	8.00	7.70	75	19.0	38.0	0.15	4	3837 8.000	3838 8.000
10.00	10.00	9.50	80	22.0	38.0	0.20	4	3837 10.000	3838 10.000
12.00	12.00	11.50	93	26.0	46.0	0.20	4	3837 12.000	3838 12.000
16.00	16.00	15.50	108	32.0	58.0	0.35	4	3837 16.000	3838 16.000
20.00	20.00	19.50	126	38.0	74.0	0.45	4	3837 20.000	3838 20.000

Standard Ratio end mills RF 100 U

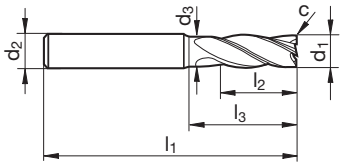


Tool material	Solid carbide	
Surface	F	F
Type	N	N
Shank form	HA	HB
	GTC	GTC

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR
Cutting data page 157

- neck clearance
- centre cutting



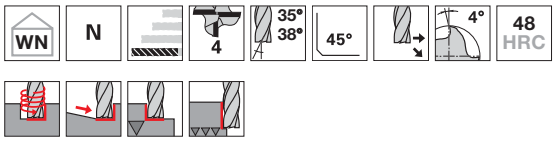




Article no.	3839	3871

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	65	18.0	28.0	0.10	4	3839 6.000	3871 6.000
8.00	8.00	7.70	75	24.0	38.0	0.15	4	3839 8.000	3871 8.000
10.00	10.00	9.50	80	30.0	38.0	0.20	4	3839 10.000	3871 10.000
12.00	12.00	11.50	93	36.0	46.0	0.20	4	3839 12.000	3871 12.000
16.00	16.00	15.50	108	48.0	58.0	0.35	4	3839 16.000	3871 16.000
20.00	20.00	19.50	126	60.0	74.0	0.45	4	3839 20.000	3871 20.000

Standard Ratio end mills RF 100 U

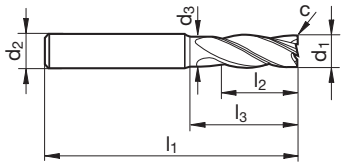


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	HA

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR
Cutting data page 157

- neck clearance
- centre cutting

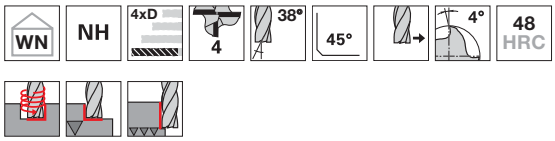




Article no.	**5582**

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm x 45°		
10.00	10.00	9.50	100	40.0	48.0	0.20	4	5582 10.000
12.00	12.00	11.50	150	45.0	58.0	0.20	4	5582 12.000
16.00	16.00	15.50	150	65.0	78.0	0.35	4	5582 16.000
20.00	20.00	19.50	150	65.0	78.0	0.45	4	5582 20.000
25.00	25.00	24.00	150	75.0	92.0	0.60	4	5582 25.000

Standard Ratio end mills RF 100 U

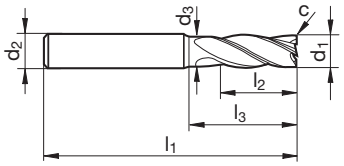


Tool material	Solid carbide	
Surface	F	F
Type	NH	NH
Shank form	HA	HB

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR
Cutting data page 157

- neck clearance
- centre cutting

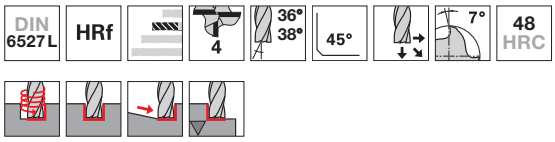




Article no.	6767	6768

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	65	24.0	28.0	0.12	4	6767 6.000	6768 6.000
8.00	8.00	7.70	75	32.0	38.0	0.16	4	6767 8.000	6768 8.000
10.00	10.00	9.50	100	40.0	58.0	0.20	4	6767 10.000	6768 10.000
12.00	12.00	11.50	100	48.0	53.0	0.24	4	6767 12.000	6768 12.000
16.00	16.00	15.50	125	64.0	75.0	0.32	4	6767 16.000	6768 16.000
20.00	20.00	19.50	150	80.0	98.0	0.40	4	6767 20.000	6768 20.000
25.00	25.00	24.00	175	100.0	117.0	0.50	4	6767 25.000	6768 25.000

Ratio roughing end mills RF 100 U

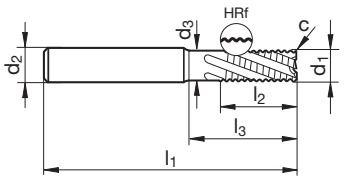


Tool material	Solid carbide	
Surface	Y	Y
Type	HRf	HRf
Shank form	HA	HB

P	•
M	•
K	•
N	
S	○
H	○

GÜHRINGNAVIGATOR
Cutting data page 158

- neck clearance
- centre cutting

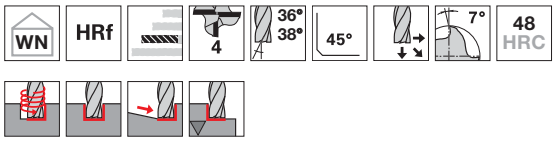




Article no.	6970	6971

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	57	13.0	20.0	0.12	4	6970 6.000	6971 6.000
8.00	8.00	7.70	63	19.0	26.0	0.16	4	6970 8.000	6971 8.000
10.00	10.00	9.50	72	22.0	30.0	0.20	4	6970 10.000	6971 10.000
12.00	12.00	11.50	83	26.0	36.0	0.24	4	6970 12.000	6971 12.000
16.00	16.00	15.50	92	32.0	42.0	0.32	4	6970 16.000	6971 16.000
20.00	20.00	19.50	104	38.0	52.0	0.40	4	6970 20.000	6971 20.000

Ratio roughing end mills RF 100 U

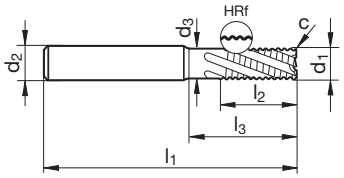


Tool material	Solid carbide	
Surface	Y	Y
Type	HRf	HRf
Shank form	HA	HB

P	•
M	•
K	•
N	
S	○
H	○

GÜHRINGNAVIGATOR
Cutting data page 158

- neck clearance
- centre cutting



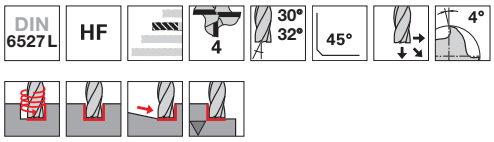




Article no.	6972	6973

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	65	13.0	28.0	0.12	4	6972 6.000	6973 6.000
8.00	8.00	7.70	75	19.0	38.0	0.16	4	6972 8.000	6973 8.000
10.00	10.00	9.50	80	22.0	38.0	0.20	4	6972 10.000	6973 10.000
12.00	12.00	11.50	93	26.0	46.0	0.24	4	6972 12.000	6973 12.000
16.00	16.00	15.50	108	32.0	58.0	0.32	4	6972 16.000	6973 16.000
20.00	20.00	19.50	126	38.0	74.0	0.40	4	6972 20.000	6973 20.000

Ratio roughing end mills RF 100 U

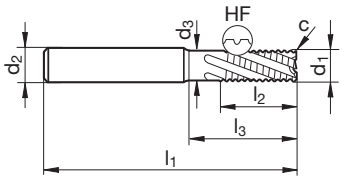


Tool material	Solid carbide	
Surface	F	F
Type	HF	HF
Shank form	HA	HB

P	•
M	
K	•
N	
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 158

- neck clearance
- centre cutting



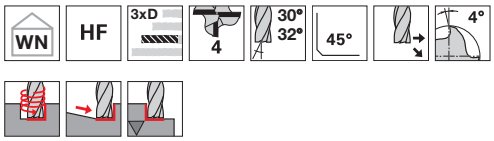




Article no.	6881	6882

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	57	13.0	20.0	0.12	4	6881 6.000	6882 6.000
8.00	8.00	7.70	63	19.0	26.0	0.16	4	6881 8.000	6882 8.000
10.00	10.00	9.50	72	22.0	30.0	0.20	4	6881 10.000	6882 10.000
12.00	12.00	11.50	83	26.0	36.0	0.24	4	6881 12.000	6882 12.000
16.00	16.00	15.50	92	32.0	42.0	0.32	4	6881 16.000	6882 16.000
20.00	20.00	19.50	104	38.0	52.0	0.40	4	6881 20.000	6882 20.000
25.00	25.00	24.00	121	45.0	63.0	0.50	4	6881 25.000	6882 25.000

Ratio roughing end mills RF 100 U

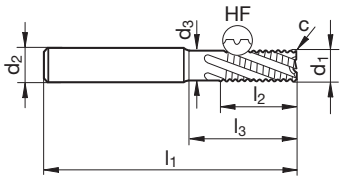


Tool material	Solid carbide	
Surface	F	F
Type	HF	HF
Shank form	HA	HB

P	•
M	
K	•
N	
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 158

- neck clearance
- centre cutting



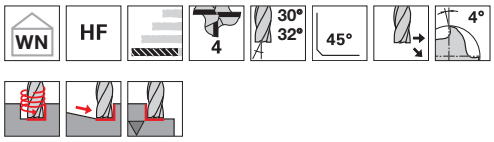




Article no.	6883	6884

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	65	18.0	28.0	0.12	4	6883 6.000	6884 6.000
8.00	8.00	7.70	75	24.0	38.0	0.16	4	6883 8.000	6884 8.000
10.00	10.00	9.50	80	30.0	38.0	0.20	4	6883 10.000	6884 10.000
12.00	12.00	11.50	93	36.0	46.0	0.24	4	6883 12.000	6884 12.000
16.00	16.00	15.50	108	48.0	58.0	0.32	4	6883 16.000	6884 16.000
20.00	20.00	19.50	126	60.0	74.0	0.40	4	6883 20.000	6884 20.000

Ratio roughing end mills RF 100 U



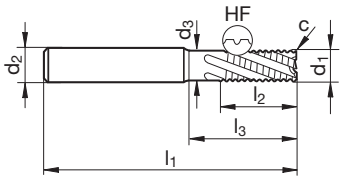
Tool material	Solid carbide	
Surface	F	F
Type	HF	HF
Shank form	~HA	~HB

P	•
M	
K	•
N	
S	
H	

GÜHRINGNAVIGATOR

Cutting data page 158

- neck clearance
- centre cutting

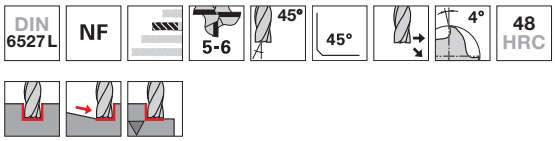




Article no.	6885	6886

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	75	13.0	34.0	0.12	4	6885 6.000	6886 6.000
8.00	8.00	7.70	100	19.0	49.0	0.16	4	6885 8.000	6886 8.000
10.00	10.00	9.50	100	22.0	48.0	0.20	4	6885 10.000	6886 10.000
12.00	12.00	11.50	150	26.0	58.0	0.24	4	6885 12.000	6886 12.000
16.00	16.00	15.50	150	32.0	78.0	0.32	4	6885 16.000	6886 16.000
20.00	20.00	19.50	150	38.0	78.0	0.40	4	6885 20.000	6886 20.000

High-performance roughing end mills RS 100 F

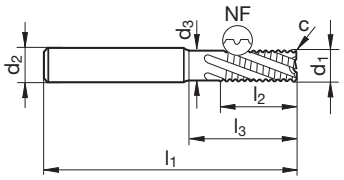


Tool material	Solid carbide	
Surface	F	F
Type	NF	NF
Shank form	HA	HB

P	•
M	
K	•
N	
S	
H	○

GÜHRINGNAVIGATOR
Cutting data page 158

- neck clearance
- centre cutting



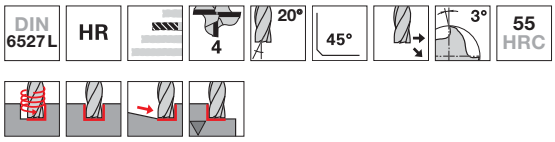




Article no.	6889	6890

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.70	57	13.0	20.0	0.30	5	6889 6.000	6890 6.000
8.00	8.00	7.70	63	19.0	26.0	0.30	5	6889 8.000	6890 8.000
10.00	10.00	9.50	72	22.0	30.0	0.30	5	6889 10.000	6890 10.000
12.00	12.00	11.50	83	26.0	36.0	0.50	5	6889 12.000	6890 12.000
14.00	14.00	13.50	83	26.0	36.0	0.50	5	6889 14.000	6890 14.000
16.00	16.00	15.50	92	32.0	42.0	0.50	6	6889 16.000	6890 16.000
18.00	18.00	17.50	92	32.0	42.0	0.50	6	6889 18.000	6890 18.000
20.00	20.00	19.50	104	38.0	52.0	0.50	6	6889 20.000	6890 20.000
25.00	25.00	24.00	121	45.0	63.0	0.60	6	6889 25.000	6890 25.000

Hard roughing end mills GS 100 H (fine teeth)

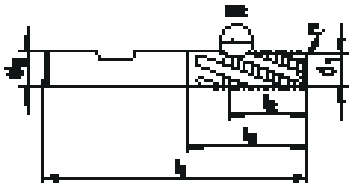


Tool material	**Solid carbide**
Surface	Y
Type	HR
Shank form	HB

P	•
M	
K	•
N	
S	
H	•

GÜHRINGNAVIGATOR
Cutting data page 160

• centre cutting

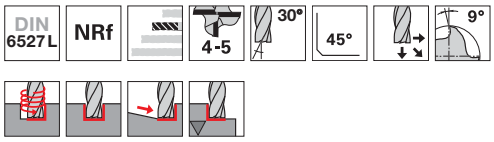




Article no. **3682**

d1 h10	d2 h6	l1	l2	l3	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm x 45°		
6.000	6.00	57.00	13.00	21.000	0.30	4	3682 6.000
8.000	8.00	63.00	19.00	27.000	0.30	4	3682 8.000
10.000	10.00	72.00	22.00	32.000	0.30	4	3682 10.000
12.000	12.00	83.00	26.00	38.000	0.50	4	3682 12.000
16.000	16.00	92.00	32.00	44.000	0.50	4	3682 16.000
20.000	20.00	104.00	38.00	54.000	0.50	4	3682 20.000

Roughing end mills GS 100 U (fine teeth)

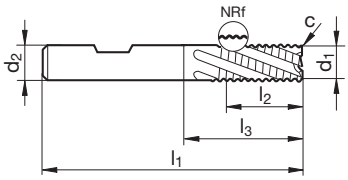


Tool material	**Solid carbide**
Surface	F
Type	NRf
Shank form	HB

P	•
M	•
K	•
N	○
S	○
H	

GÜHRINGNAVIGATOR
Cutting data page 160

• centre cutting

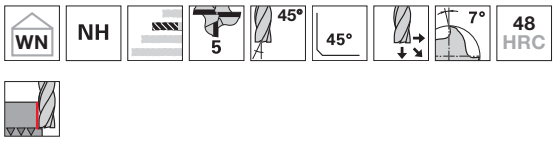




Article no. **3723**

d1 h10	d2 h6	l1	l2	l3	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm x 45°		
6.000	6.00	57.00	13.00	21.000	0.30	4	3723 6.000
8.000	8.00	63.00	19.00	27.000	0.30	4	3723 8.000
10.000	10.00	72.00	22.00	32.000	0.30	4	3723 10.000
12.000	12.00	83.00	26.00	38.000	0.50	4	3723 12.000
14.000	14.00	83.00	26.00	38.000	0.50	4	3723 14.000
14.000	16.00	92.00	32.00	42.000	0.50	4	3723 14.001
16.000	16.00	92.00	32.00	44.000	0.50	4	3723 16.000
18.000	18.00	92.00	32.00	44.000	0.50	4	3723 18.000
20.000	20.00	104.00	38.00	54.000	0.50	4	3723 20.000
25.000	25.00	121.00	45.00	65.000	0.60	5	3723 25.000

Ratio end mills Superfinish RF 100 SF

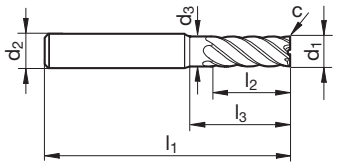


P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 157

- neck clearance
- centre cutting

Tool material	Solid carbide	
Surface	F	F
Type	NH	NH
Shank form	HA	HB
	GTC	GTC





Article no.	6709	6710

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
4.00	6.00	3.80	57	11.0	18.0	0.05	5	6709 4.000	6710 4.000
5.00	6.00	4.80	57	13.0	18.0	0.05	5	6709 5.000	6710 5.000
6.00	6.00	5.70	57	13.0	20.0	0.05	5	6709 6.000	6710 6.000
8.00	8.00	7.70	63	19.0	26.0	0.10	5	6709 8.000	6710 8.000
10.00	10.00	9.50	72	22.0	30.0	0.10	5	6709 10.000	6710 10.000
12.00	12.00	11.50	83	26.0	36.0	0.10	5	6709 12.000	6710 12.000
16.00	16.00	15.50	92	32.0	42.0	0.15	5	6709 16.000	6710 16.000
20.00	20.00	19.50	104	38.0	52.0	0.15	5	6709 20.000	6710 20.000
25.00	25.00	24.00	121	45.0	63.0	0.20	5	6709 25.000	6710 25.000

Ratio end mills Superfinish RF 100 SF

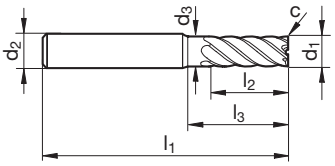
WN | NH | 3xD | 5 | 45° | 45° | 7° | 48 HRC

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 157

• neck clearance
• centre cutting

Tool material	Solid carbide	
Surface	F	F
Type	NH	NH
Shank form	HA	HB
	GTC	GTC



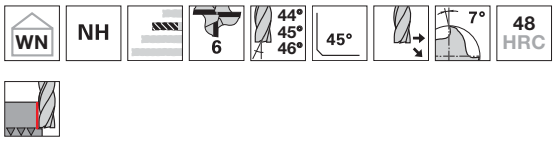




Article no.	3897	3898

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
4.00	6.00	3.80	65	12.0	26.0	0.05	5	3897 4.000	3898 4.000
5.00	6.00	4.80	65	15.0	26.0	0.05	5	3897 5.000	3898 5.000
6.00	6.00	5.70	65	18.0	28.0	0.05	5	3897 6.000	3898 6.000
8.00	8.00	7.70	75	24.0	38.0	0.10	5	3897 8.000	3898 8.000
10.00	10.00	9.50	80	30.0	38.0	0.10	5	3897 10.000	3898 10.000
12.00	12.00	11.50	93	36.0	46.0	0.10	5	3897 12.000	3898 12.000
16.00	16.00	15.50	108	48.0	58.0	0.15	5	3897 16.000	3898 16.000
20.00	20.00	19.50	126	60.0	74.0	0.15	5	3897 20.000	3898 20.000

Ratio end mills Superfinish RF 100 SF

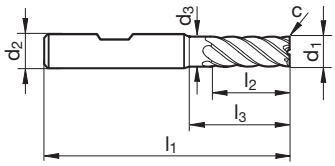


Tool material	**Solid carbide**
Surface	R
Type	NH
Shank form	HB

P	•
M	•
K	
N	•
S	•
H	

GÜHRINGNAVIGATOR
Cutting data page 157

- Raptor coating
- neck clearance
- centre cutting

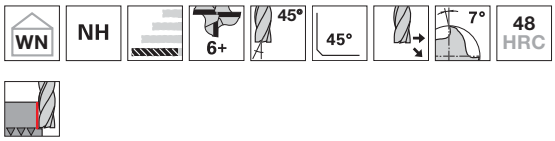




Article no. **6727**

d1 h10	d2 h6	d3	l1	l2	l3	c	Z	Order no.
mm	mm	mm	mm	mm	mm	mm x 45°		
8.00	8.00	7.70	63	19.0	26.0	0.10	6	6727 8.000
10.00	10.00	9.50	72	22.0	30.0	0.10	6	6727 10.000
12.00	12.00	11.50	83	26.0	36.0	0.10	6	6727 12.000
16.00	16.00	15.50	92	32.0	42.0	0.15	6	6727 16.000
20.00	20.00	19.50	104	38.0	52.0	0.15	6	6727 20.000

Multi-tooth end mills GH 100 U

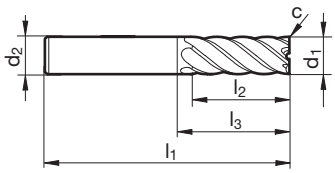


Tool material	**Solid carbide**
Surface	F
Type	NH
Shank form	HA

P	•
M	•
K	•
N	•
S	○
H	

GÜHRINGNAVIGATOR
Cutting data page 159

• centre cutting

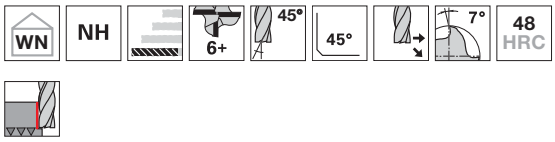




Article no. **3691**

d1 k12	d2 h6	l1	l2	l3	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm x 45°		
6.000	6.00	75.00	30.00	39.000	0.05	6	3691 6.000
8.000	8.00	100.00	40.00	64.000	0.10	6	3691 8.000
10.000	10.00	100.00	40.00	60.000	0.10	6	3691 10.000
12.000	12.00	150.00	45.00	105.000	0.10	6	3691 12.000
16.000	16.00	150.00	65.00	102.000	0.15	6	3691 16.000
20.000	20.00	150.00	65.00	100.000	0.15	8	3691 20.000
25.000	25.00	150.00	75.00	94.000	0.20	10	3691 25.000

Multi-tooth end mills GH 100 U



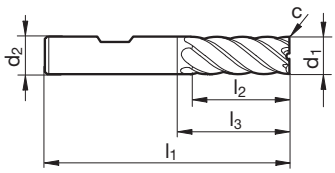
Tool material	**Solid carbide**
Surface	F
Type	NH
Shank form	HB

P	•
M	•
K	•
N	•
S	○
H	

GÜHRINGNAVIGATOR

Cutting data page 159

• centre cutting

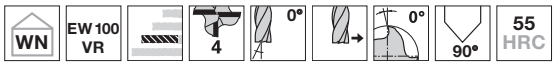




Article no. **3693**

d1 k12	d2 h6	l1	l2	l3	c	Z	**Order no.**
mm	mm	mm	mm	mm	mm x 45°		
4.000	6.00	65.000	16.000	18.500	0.05	6	3693 4.000
5.000	6.00	65.000	18.000	20.900	0.05	6	3693 5.000
6.000	6.00	75.000	30.000	39.000	0.05	6	3693 6.000
8.000	8.00	100.000	40.000	64.000	0.10	6	3693 8.000
10.000	10.00	100.000	40.000	60.000	0.10	6	3693 10.000
12.000	12.00	150.000	45.000	105.000	0.10	6	3693 12.000
16.000	16.00	150.000	65.000	102.000	0.15	6	3693 16.000
20.000	20.00	150.000	65.000	100.000	0.15	8	3693 20.000
25.000	25.00	150.000	75.000	94.000	0.20	10	3693 25.000
25.000	25.00	150.000	75.000	94.000	0.20	8	3693 25.001
32.000	32.00	186.000	106.000	126.000	0.30	8	3693 32.000

Front/back deburrer 90°



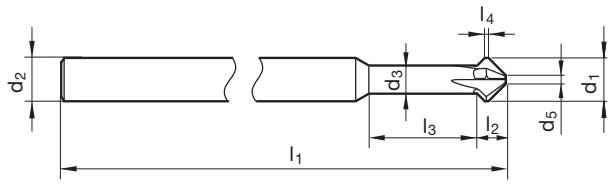
Tool material	**Solid carbide**
Surface	a
Type	EW 100 VR
Shank form	HA

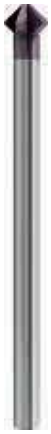
P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR

Cutting data page 161

- neck clearance < Ø 6.0 mm
- without centre cutting

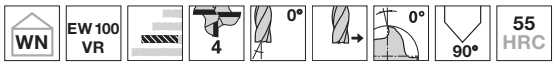




Article no. **495**

d1	d2 h6	d3	d5	l1	l2	l3	l4	Z	Order no.
mm	mm	mm	mm	mm	mm	mm	mm		
3.000	4.00	2.200	0.600	75.000	2.100	9.300	0.500	4	495 3.000
4.000	4.00	2.900	0.800	75.000	2.700	12.300	0.500	4	495 4.000
5.000	5.00	3.900	1.000	75.000	3.000	15.000	0.500	4	495 5.000
6.000	6.00	3.900	1.200	100.000	3.900	14.300	0.500	4	495 6.000
8.000	6.00	6.000	1.600	100.000	4.700		0.500	4	495 8.000
10.000	6.00	6.000	2.000	100.000	6.500		0.500	4	495 10.000
12.000	6.00	6.000	2.400	100.000	8.300		0.500	4	495 12.000

Front/back deburrer 90°, sets



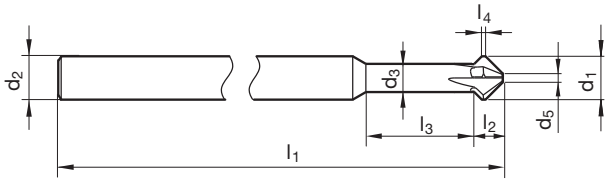
Tool material	**Solid carbide**
Surface	a
Type	EW 100 VR
Shank form	HA

P	•
M	•
K	•
N	○
S	•
H	•

GÜHRINGNAVIGATOR

Cutting data page 161

- neck clearance < Ø 6.0 mm
- without centre cutting
- consisting of art. no. 495





Article no.	**6013**

Ø-range	Pieces/set	**Order no.**
mm		
4/6/10	3	6013 1.000
4/5/6/8/10	5	6013 2.000

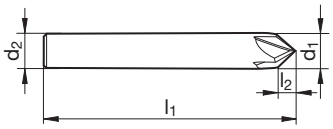
Chamfering milling cutters 90°



Tool material	Solid carbide	
Surface	A	A
Type	N	N
Shank form	HA	HB

P	•
M	•
K	•
N	•
S	•
H	○

GÜHRINGNAVIGATOR
Cutting data page 161







d1 js9	d2 h6	l1	l2	Z	Order no.	
mm	mm	mm	mm		5578	5579
4.000	4.000	50.000	2.000	4	5578 4.000	
6.000	6.000	57.000	3.000	4	5578 6.000	5579 6.000
8.000	8.000	63.000	4.000	4	5578 8.000	5579 8.000
10.000	10.000	72.000	5.000	4	5578 10.000	5579 10.000
12.000	12.000	83.000	6.000	4	5578 12.000	5579 12.000

Chamfering milling cutters 90°

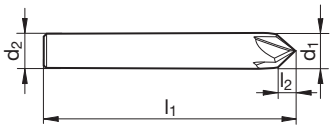


Tool material	Solid carbide	
Surface	Y	Y
Type	H	H
Shank form	HA	HB

P	•
M	•
K	•
N	
S	•
H	•

GÜHRINGNAVIGATOR

Cutting data page 161







d1 js9	d2 h6	l1	l2	Z	Order no.	
mm	mm	mm	mm		6784	6785
4.000	4.000	50.000	2.000	4	6784 4.000	
6.000	6.000	57.000	3.000	4	6784 6.000	6785 6.000
8.000	8.000	63.000	4.000	4	6784 8.000	6785 8.000
10.000	10.000	72.000	5.000	4	6784 10.000	6785 10.000
12.000	12.000	83.000	6.000	4	6784 12.000	6785 12.000

Chamfering milling cutters 90°

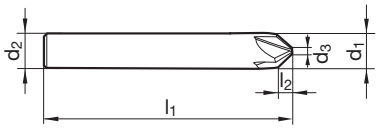


Tool material	Solid carbide	
Surface	A	A
Type	N	N
Shank form	HA	HB
	NEW	NEW

P	•
M	•
K	•
N	•
S	○
H	○

GÜHRINGNAVIGATOR
Cutting data page 161

- face cutting
- without centre cutting



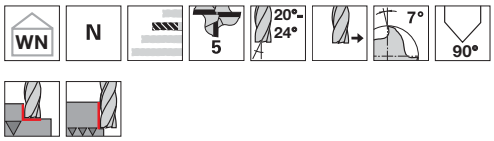




Article no.	6786	6787

d1 js9	d2 h6	d5	l1	l6	Z	Order no.	
mm	mm	mm	mm	mm			
6.000	6.000	1.500	57.000	2.250	6	6786 6.000	6787 6.000
8.000	8.000	2.000	63.000	3.000	6	6786 8.000	6787 8.000
10.000	10.000	3.000	72.000	3.500	6	6786 10.000	6787 10.000
12.000	12.000	3.000	83.000	4.500	6	6786 12.000	6787 12.000
16.000	16.000	4.000	92.000	6.000	6	6786 16.000	6787 16.000
20.000	20.000	6.000	92.000	7.000	6	6786 20.000	6787 20.000

90° Chamfering milling cutters SpyroTec



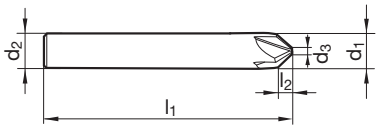
Tool material	Solid carbide	
Surface	A	A
Type	N	N
Shank form	HA	HB

P	•
M	•
K	○
N	•
S	•
H	

GÜHRINGNAVIGATOR

Cutting data page 161

- face cutting
- without centre cutting



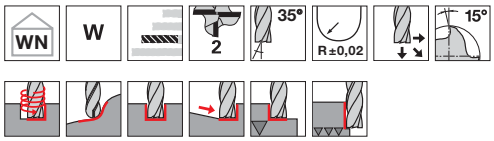




Article no.	6992	6993

d1 js9	d2 h6	d3	l1	l2	Z	Order no.	
mm	mm	mm	mm	mm			
6.000	6.000	1.500	57.000	2.250	5	6992 6.000	6993 6.000
8.000	8.000	2.000	63.000	3.000	5	6992 8.000	6993 8.000
10.000	10.000	2.500	72.000	3.750	5	6992 10.000	6993 10.000
12.000	12.000	3.000	83.000	4.500	5	6992 12.000	6993 12.000
16.000	16.000	4.000	92.000	6.000	5	6992 16.000	6993 16.000
20.000	20.000	5.000	104.000	7.500	5	6992 20.000	6993 20.000

Ball nose end mills GA 200 A



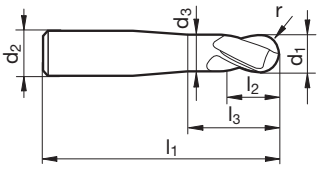
Tool material	**Solid carbide**
Surface	Cb
Type	W
Shank form	HA

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 153

NEW

- neck clearance
- centre cutting

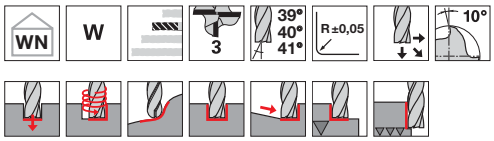




Article no. **6984**

d1 h10	d2 h6	d3	l1	l2	l3	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
3.00	6.00	2.80	57	4.0	15.0	1.5	2	6984 3.000
4.00	6.00	3.80	57	5.0	18.0	2.0	2	6984 4.000
5.00	6.00	4.80	57	6.0	18.0	2.5	2	6984 5.000
6.00	6.00	5.70	57	7.0	20.0	3.0	2	6984 6.000
8.00	8.00	7.70	63	9.0	26.0	4.0	2	6984 8.000
10.00	10.00	9.50	72	11.0	30.0	5.0	2	6984 10.000
12.00	12.00	11.50	83	12.0	36.0	6.0	2	6984 12.000
16.00	16.00	15.50	92	16.0	42.0	8.0	2	6984 16.000

Ratio end mills Alu RF 100 A

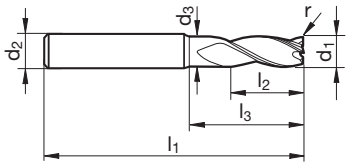


Tool material	Solid carbide	
Surface	◯	◯
Type	W	W
Shank form	HA	HB

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 157

- nano polished cutting edges
- neck clearance
- centre cutting



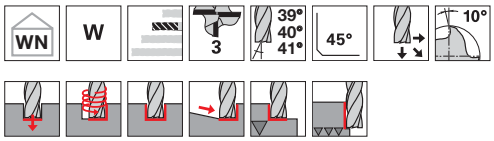




Article no.	3599	6729

d1 e8	d2 h6	d3	l1	l2	l3	r	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm			
6.00	6.00	5.70	57	13.0	20.0	0.500	3	3599 6.005	6729 6.005
6.00	6.00	5.70	57	13.0	20.0	1.000	3	3599 6.010	6729 6.010
8.00	8.00	7.70	63	19.0	26.0	0.500	3	3599 8.005	6729 8.005
8.00	8.00	7.70	63	19.0	26.0	1.000	3	3599 8.010	6729 8.010
10.00	10.00	9.50	72	22.0	30.0	0.500	3	3599 10.005	6729 10.005
10.00	10.00	9.50	72	22.0	30.0	1.000	3	3599 10.010	6729 10.010
10.00	10.00	9.50	72	22.0	30.0	1.500	3	3599 10.015	6729 10.015
12.00	12.00	11.50	83	26.0	36.0	0.500	3	3599 12.005	6729 12.005
12.00	12.00	11.50	83	26.0	36.0	1.000	3	3599 12.010	6729 12.010
12.00	12.00	11.50	83	26.0	36.0	1.500	3	3599 12.015	6729 12.015
12.00	12.00	11.50	83	26.0	36.0	2.000	3	3599 12.020	6729 12.020
12.00	12.00	11.50	83	26.0	36.0	2.500	3	3599 12.025	6729 12.025
12.00	12.00	11.50	83	26.0	36.0	3.000	3	3599 12.030	6729 12.030
12.00	12.00	11.50	83	26.0	36.0	4.000	3	3599 12.040	6729 12.040
16.00	16.00	15.50	92	32.0	42.0	1.000	3	3599 16.010	6729 16.010
16.00	16.00	15.50	92	32.0	42.0	2.000	3	3599 16.020	6729 16.020
16.00	16.00	15.50	92	32.0	42.0	2.500	3	3599 16.025	6729 16.025
16.00	16.00	15.50	92	32.0	42.0	3.000	3	3599 16.030	6729 16.030
16.00	16.00	15.50	92	32.0	42.0	4.000	3	3599 16.040	6729 16.040
20.00	20.00	19.50	104	38.0	52.0	1.000	3	3599 20.010	6729 20.010
20.00	20.00	19.50	104	38.0	52.0	2.000	3	3599 20.020	6729 20.020
20.00	20.00	19.50	104	38.0	52.0	2.500	3	3599 20.025	6729 20.025
20.00	20.00	19.50	104	38.0	52.0	3.000	3	3599 20.030	6729 20.030
20.00	20.00	19.50	104	38.0	52.0	4.000	3	3599 20.040	6729 20.040
25.00	25.00	24.00	121	45.0	63.0	2.000	3	3599 25.020	6729 25.020
25.00	25.00	24.00	121	45.0	63.0	3.000	3	3599 25.030	6729 25.030
25.00	25.00	24.00	121	45.0	63.0	4.000	3	3599 25.040	6729 25.040

Ratio end mills Alu RF 100 A



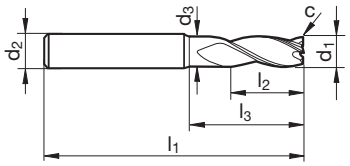
Tool material	Solid carbide	
Surface	Cb	Cb
Type	W	W
Shank form	HA	HB

P	
M	
K	
N	•
S	
H	

GÜHRING NAVIGATOR

Cutting data page 157

- nano polished cutting edges
- neck clearance
- centre cutting



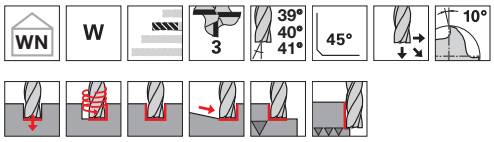




Article no.	6978	6979

d1 e8	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
3.00	6.00	2.80	57	8.0	15.0	0.030	3	6978 3.000	6979 3.000
4.00	6.00	3.80	57	11.0	18.0	0.040	3	6978 4.000	6979 4.000
5.00	6.00	4.80	57	13.0	18.0	0.050	3	6978 5.000	6979 5.000
6.00	6.00	5.70	57	13.0	20.0	0.060	3	6978 6.000	6979 6.000
8.00	8.00	7.70	63	19.0	26.0	0.080	3	6978 8.000	6979 8.000
10.00	10.00	9.50	72	22.0	30.0	0.100	3	6978 10.000	6979 10.000
12.00	12.00	11.50	83	26.0	36.0	0.120	3	6978 12.000	6979 12.000
16.00	16.00	15.50	92	32.0	42.0	0.160	3	6978 16.000	6979 16.000
20.00	20.00	19.50	104	38.0	52.0	0.200	3	6978 20.000	6979 20.000

Ratio end mills Alu RF 100 A

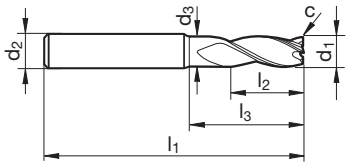


Tool material	Solid carbide	
Surface	◯	◯
Type	W	W
Shank form	HA	HB

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 157

- nano polished cutting edges
- neck clearance
- centre cutting



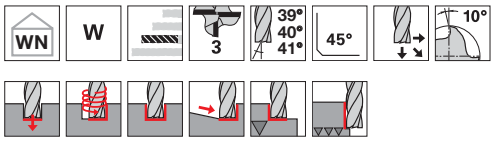




Article no.	3472	6702

d1 e8	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
3.00	6.00	2.80	57	8.0	15.0	0.030	3	3472 3.000	6702 3.000
4.00	6.00	3.80	57	11.0	18.0	0.040	3	3472 4.000	6702 4.000
5.00	6.00	4.80	57	13.0	18.0	0.050	3	3472 5.000	6702 5.000
6.00	6.00	5.70	57	13.0	20.0	0.060	3	3472 6.000	6702 6.000
8.00	8.00	7.70	63	19.0	26.0	0.080	3	3472 8.000	6702 8.000
10.00	10.00	9.50	72	22.0	30.0	0.100	3	3472 10.000	6702 10.000
12.00	12.00	11.50	83	26.0	36.0	0.120	3	3472 12.000	6702 12.000
16.00	16.00	15.50	92	32.0	42.0	0.160	3	3472 16.000	6702 16.000
20.00	20.00	19.50	104	38.0	52.0	0.200	3	3472 20.000	6702 20.000

Ratio end mills Alu RF 100 A

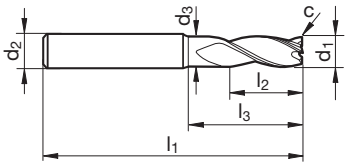


Tool material	Solid carbide	
Surface	◯	◯
Type	W	W
Shank form	HA	HB

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 157

- nano polished cutting edges
- neck clearance
- centre cutting



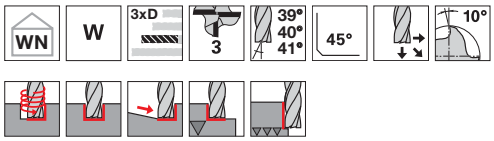




Article no.	3473	6703

d1 e8	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
6.00	6.00	5.50	65	13.0	28.0	0.060	3	3473 6.000	6703 6.000
8.00	8.00	7.50	75	19.0	38.0	0.080	3	3473 8.000	6703 8.000
10.00	10.00	9.20	80	22.0	38.0	0.100	3	3473 10.000	6703 10.000
12.00	12.00	11.20	93	26.0	46.0	0.120	3	3473 12.000	6703 12.000
16.00	16.00	15.00	108	32.0	58.0	0.160	3	3473 16.000	6703 16.000
20.00	20.00	19.00	126	38.0	74.0	0.200	3	3473 20.000	6703 20.000

Ratio end mills Alu RF 100 A

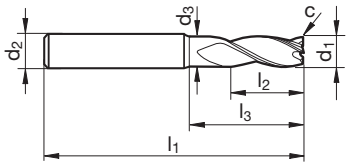


Tool material	Solid carbide	
Surface	◯	◯
Type	W	W
Shank form	HA	HB

P
M
K
N •
S
H

GÜHRINGNAVIGATOR
Cutting data page 157

- nano polished cutting edges
- re-inforced core
- neck clearance
- centre cutting



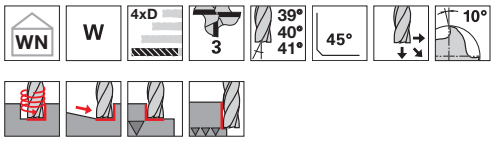




Article no.	6730	6731

d1 e8	d2 h6	d3	l1	l2	l3	c	Z	Order no.	
mm	mm	mm	mm	mm	mm	mm x 45°			
5.000	6.000	4.800	57.000	15.000	19.400	0.050	3	6730 5.000	6731 5.000
6.000	6.000	5.700	65.000	18.000	28.000	0.060	3	6730 6.000	6731 6.000
8.000	8.000	7.700	75.000	24.000	38.000	0.080	3	6730 8.000	6731 8.000
10.000	10.000	9.500	80.000	30.000	38.000	0.100	3	6730 10.000	6731 10.000
12.000	12.000	11.500	93.000	36.000	46.000	0.120	3	6730 12.000	6731 12.000
16.000	16.000	15.500	108.000	48.000	58.000	0.160	3	6730 16.000	6731 16.000
20.000	20.000	19.500	126.000	60.000	74.000	0.200	3	6730 20.000	6731 20.000

Ratio end mills Alu RF 100 A

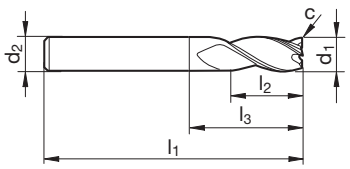


Tool material	Solid carbide	
Surface	◯	◯
Type	W	W
Shank form	HA	HB

P
M
K
N •
S
H

GÜHRINGNAVIGATOR
Cutting data page 157

- nano polished cutting edges
- re-inforced core
- centre cutting

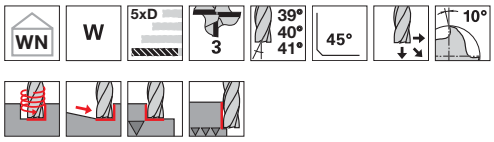




Article no.	6732	6733

d1 e8	d2 h6	l1	l2	l4	c	Z	Order no.	
mm	mm	mm	mm	mm	mm x 45°			
6.000	6.00	65.00	24.00	29.0	0.060	3	6732 6.000	6733 6.000
8.000	8.00	75.00	32.00	39.0	0.080	3	6732 8.000	6733 8.000
10.000	10.00	100.00	40.00	60.0	0.100	3	6732 10.000	6733 10.000
12.000	12.00	100.00	48.00	55.0	0.120	3	6732 12.000	6733 12.000
16.000	16.00	125.00	64.00	77.0	0.160	3	6732 16.000	6733 16.000
20.000	20.00	150.00	80.00	100.0	0.200	3	6732 20.000	6733 20.000

Ratio end mills Alu RF 100 A

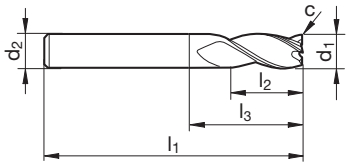


Tool material	Solid carbide	
Surface	◯	◯
Type	W	W
Shank form	HA	HB

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 157

- nano polished cutting edges
- re-inforced core
- centre cutting

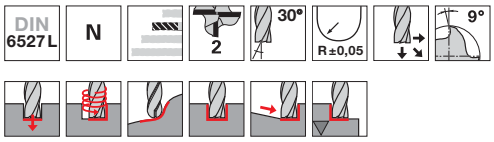




Article no.	**6734**	**6735**

d1 e8	d2 h6	l1	l2	l4	c	Z	Order no.	
mm	mm	mm	mm	mm	mm x 45°			
6.000	6.00	75.00	30.00	39.0	0.060	3	6734 6.000	6735 6.000
8.000	8.00	86.00	40.00	50.0	0.080	3	6734 8.000	6735 8.000
10.000	10.00	100.00	50.00	60.0	0.100	3	6734 10.000	6735 10.000
12.000	12.00	120.00	60.00	75.0	0.120	3	6734 12.000	6735 12.000
16.000	16.00	150.00	80.00	102.0	0.160	3	6734 16.000	6735 16.000
20.000	20.00	175.00	100.00	125.0	0.200	3	6734 20.000	6735 20.000

Ball nose slot drills (2-fluted)

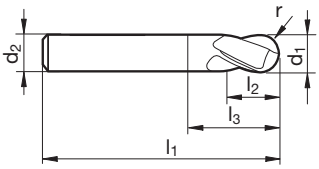


Tool material	**Solid carbide**
Surface	Ⓓ
Type	N
Shank form	HA

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 153

- for fibre composite plastics
- for graphite
- centre cutting

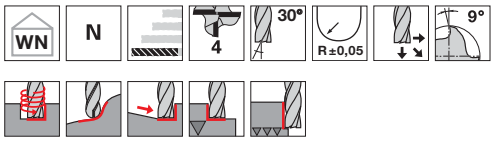




Article no.	**6724**

d1 k12	d2 h6	l1	l2	l3	r	Z	**Order no.**
mm	mm	mm	mm	mm	mm		
3.00	6.00	57	7.0	11.9	1.500	2	6724 3.000
4.00	6.00	57	8.0	13.4	2.000	2	6724 4.000
5.00	6.00	57	10.0	16.9	2.500	2	6724 5.000
6.00	6.00	57	10.0	21.0	3.000	2	6724 6.000
8.00	8.00	63	16.0	27.0	4.000	2	6724 8.000
10.00	10.00	72	19.0	32.0	5.000	2	6724 10.000
12.00	12.00	83	22.0	38.0	6.000	2	6724 12.000

Ball nose end mills (4-fluted)

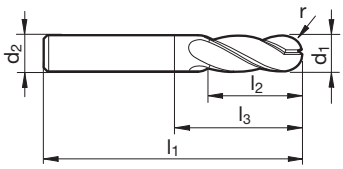


Tool material	**Solid carbide**
Surface	Ⓓ
Type	N
Shank form	HA

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 153

- for fibre composite plastics
- for graphite
- centre cutting

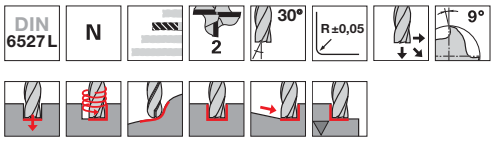




Article no. **6725**

d1 k12	d2 h6	l1	l2	l3	r	Z	**Order no.**
mm	mm	mm	mm	mm	mm		
3.000	3.000	75.000	20.000	47.000	1.500	4	6725 3.000
4.000	4.000	75.000	25.000	47.000	2.000	4	6725 4.000
5.000	5.000	75.000	30.000	47.000	2.500	4	6725 5.000
6.000	6.000	75.000	30.000	39.000	3.000	4	6725 6.000
8.000	8.000	100.000	40.000	64.000	4.000	4	6725 8.000
10.000	10.000	100.000	40.000	60.000	5.000	4	6725 10.000
12.000	12.000	150.000	45.000	105.000	6.000	4	6725 12.000

Slot drills with corner radius (2-fluted)

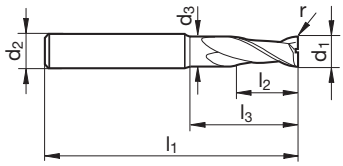


Tool material	**Solid carbide**
Surface	Ⓓ
Type	N
Shank form	HA

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 161

- for fibre composite plastics
- for graphite
- centre cutting

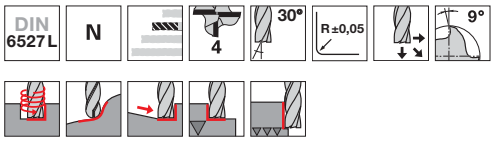




Article no. **6722**

d1 h10	d2 h6	d3	l1	l2	l3	r	Z	Order no.
mm	mm	mm	mm	mm	mm	mm		
6.00	6.00	5.70	57	10.0	20.0	0.500	2	6722 6.005
6.00	6.00	5.70	57	10.0	20.0	1.000	2	6722 6.010
8.00	8.00	7.70	63	16.0	26.0	0.500	2	6722 8.005
8.00	8.00	7.70	63	16.0	26.0	1.000	2	6722 8.010
10.00	10.00	9.50	72	19.0	30.0	0.500	2	6722 10.005
10.00	10.00	9.50	72	19.0	30.0	1.000	2	6722 10.010
12.00	12.00	11.50	83	22.0	36.0	0.500	2	6722 12.005
12.00	12.00	11.50	83	22.0	36.0	1.000	2	6722 12.010

End mills with corner radius (4-fluted)

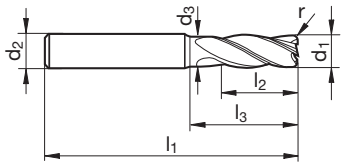


Tool material	**Solid carbide**
Surface	Ⓓ
Type	N
Shank form	HA

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 161

- for fibre composite plastics
- for graphite
- neck clearance
- centre cutting

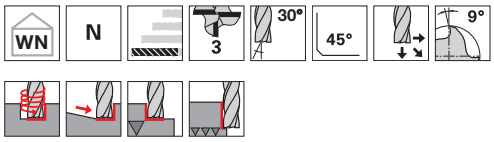




Article no.	**6723**

d1 h10	d2 h6	d3	l1	l2	l3	r	Z	**Order no.**
mm	mm	mm	mm	mm	mm	mm		
6.000	6.000	5.700	57.000	13.000	20.000	0.500	4	6723 6.005
6.000	6.000	5.700	57.000	13.000	20.000	1.000	4	6723 6.010
8.000	8.000	7.700	63.000	19.000	26.000	0.500	4	6723 8.005
8.000	8.000	7.700	63.000	19.000	26.000	1.000	4	6723 8.010
10.000	10.000	9.500	72.000	22.000	30.000	0.500	4	6723 10.005
10.000	10.000	9.500	72.000	22.000	30.000	1.000	4	6723 10.010
12.000	12.000	11.500	83.000	26.000	36.000	0.500	4	6723 12.005
12.000	12.000	11.500	83.000	26.000	36.000	1.000	4	6723 12.010

Slot drills XL (3-fluted)

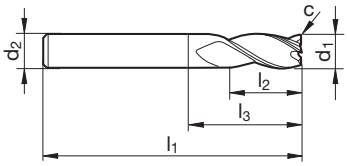


Tool material	**Solid carbide**
Surface	Ⓓ
Type	N
Shank form	HA

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR
Cutting data page 161

- for fibre composite plastics
- for graphite
- centre cutting

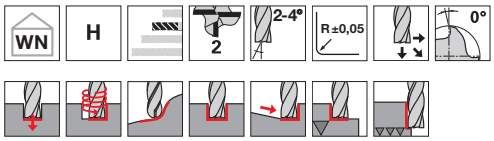




Article no. **6721**

d1 h10	d2 h6	l1	l2	l3	c	Z	Order no.
mm	mm	mm	mm	mm	mm x 45°		
3.000	3.00	75.000	20.000	47.000	0.050	3	6721 3.000
4.000	4.00	75.000	25.000	47.000	0.050	3	6721 4.000
5.000	5.00	75.000	30.000	47.000	0.050	3	6721 5.000
6.000	6.00	75.000	30.000	39.000	0.050	3	6721 6.000
8.000	8.00	100.000	40.000	64.000	0.100	3	6721 8.000
10.000	10.00	100.000	40.000	60.000	0.100	3	6721 10.000
12.000	12.00	150.000	45.000	105.000	0.100	3	6721 12.000
16.000	16.00	150.000	65.000	102.000	0.150	3	6721 16.000

PCD slot drills (2-fluted)



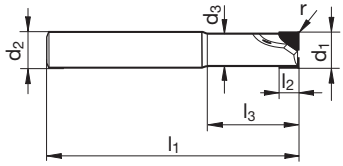
Tool material	PCD
Surface	◯
Type	H
Shank form	HA

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR

Cutting data page 161

- for fibre composite plastics
- for graphite
- with internal cooling
- neck clearance
- centre cutting
- other corner radii on request

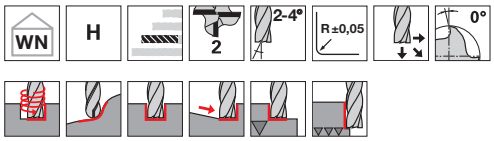




Article no. **5492**

d1	d1	d2 h6	d3	l1	l2	l3	r	Z	Order no.
mm		mm	mm	mm	mm	mm	mm		
4.00	± 0,02	6.00	3.70	51	6.0	14.0	0.1	2	5492 4.000
5.00	± 0,02	6.00	4.70	51	8.0	14.5	0.1	2	5492 5.000
6.00	± 0,02	6.00	5.70	57	8.0	20.0	0.1	2	5492 6.000
8.00	± 0,02	8.00	7.40	63	8.0	26.0	0.1	2	5492 8.000
8.00	± 0,02	8.00	7.40	63	12.0	26.0	0.1	2	5492 8.001
10.00	± 0,02	10.00	9.40	72	8.0	30.0	0.1	2	5492 10.000
10.00	± 0,02	10.00	9.40	72	16.0	30.0	0.1	2	5492 10.001
12.00	± 0,02	12.00	11.20	83	8.0	36.0	0.1	2	5492 12.000
12.00	± 0,02	12.00	11.20	83	16.0	36.0	0.1	2	5492 12.001
14.00	± 0,02	14.00	13.00	83	8.0	36.0	0.1	2	5492 14.000
14.00	± 0,02	14.00	13.00	83	16.0	36.0	0.1	2	5492 14.001
16.00	± 0,02	16.00	15.00	100	12.0	50.0	0.1	2	5492 16.000
16.00	± 0,02	16.00	15.00	100	20.0	50.0	0.1	2	5492 16.001
18.00	± 0,02	18.00	17.00	100	12.0	50.0	0.1	2	5492 18.000
18.00	± 0,02	18.00	17.00	100	20.0	50.0	0.1	2	5492 18.001
20.00	± 0,02	20.00	19.00	100	12.0	48.0	0.1	2	5492 20.000
20.00	± 0,02	20.00	19.00	100	20.0	48.0	0.1	2	5492 20.001

PCD slot drills (2-fluted)



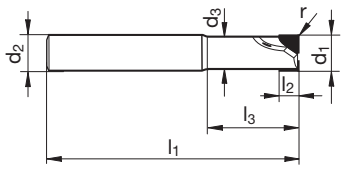
Tool material	PCD
Surface	◯
Type	H
Shank form	cyl.

P	
M	
K	
N	•
S	
H	

GÜHRINGNAVIGATOR

Cutting data page 161

- for fibre composite plastics
- for graphite
- with internal cooling
- neck clearance
- centre cutting
- other corner radii on request





Article no.	5493

d1	d1	d2 h6	d3	l1	l2	l3	r	Z	Order no.
mm		mm	mm	mm	mm	mm	mm		
4.000	± 0,02	6.000	3.700	70.000	6.000	14.000	0.100	2	5493 4.000
5.000	± 0,02	6.000	4.700	70.000	8.000	14.500	0.100	2	5493 5.000
6.000	± 0,02	6.000	5.700	75.000	8.000	20.000	0.100	2	5493 6.000
8.000	± 0,02	8.000	7.400	100.000	8.000	26.000	0.100	2	5493 8.000
8.000	± 0,02	8.000	7.400	100.000	12.000	26.000	0.100	2	5493 8.001
10.000	± 0,02	10.000	9.400	100.000	8.000	30.000	0.100	2	5493 10.000
10.000	± 0,02	10.000	9.400	100.000	16.000	30.000	0.100	2	5493 10.001
12.000	± 0,02	12.000	11.200	100.000	8.000	36.000	0.100	2	5493 12.000
12.000	± 0,02	12.000	11.200	100.000	16.000	36.000	0.100	2	5493 12.001
14.000	± 0,02	14.000	13.000	100.000	8.000	36.000	0.100	2	5493 14.000
14.000	± 0,02	14.000	13.000	100.000	16.000	36.000	0.100	2	5493 14.001
16.000	± 0,02	16.000	15.000	150.000	12.000	50.000	0.100	2	5493 16.000
16.000	± 0,02	16.000	15.000	150.000	20.000	50.000	0.100	2	5493 16.001
18.000	± 0,02	18.000	17.000	125.000	12.000	50.000	0.100	2	5493 18.000
18.000	± 0,02	18.000	17.000	125.000	20.000	50.000	0.100	2	5493 18.001
18.000	± 0,02	18.000	17.000	150.000	12.000	50.000	0.100	2	5493 18.002
18.000	± 0,02	18.000	17.000	150.000	20.000	50.000	0.100	2	5493 18.003
20.000	± 0,02	20.000	19.000	150.000	12.000	48.000	0.100	2	5493 20.000
20.000	± 0,02	20.000	19.000	150.000	20.000	48.000	0.100	2	5493 20.001

Milling conditions:

- HSC — stable machining conditions, low cutting depth, high cutting values
- short tools
- long tools

Correction factors:

	v_c	f_z
medium length tools	-25%	-25%
extra length tools	-50%	-50%
uncoated tools	-60%	-25%



Material	Hardness	Type	Application	a_p max.	a_e max.	v_c	f_z (mm/tooth) with nom. Ø 1	2	3	4	5	6	8	10	12
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	G-Mold 55	Roughing	0.10xD	0.30xD	240	0.015	0.030	0.045	0.060	0.075	0.090	0.120	0.150	0.180
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	340	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
		G-Mold 55	Fine finishing	0.01xD	0.02xD	360	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	G-Mold 55	Roughing	0.10xD	0.30xD	220	0.015	0.030	0.045	0.060	0.075	0.090	0.120	0.150	0.180
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	310	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
		G-Mold 55	Fine finishing	0.01xD	0.02xD	330	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	G-Mold 55	Roughing	0.10xD	0.30xD	200	0.012	0.024	0.036	0.048	0.060	0.072	0.096	0.120	0.144
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	280	0.008	0.017	0.025	0.034	0.042	0.050	0.067	0.084	0.101
		G-Mold 55	Fine finishing	0.01xD	0.02xD	300	0.008	0.017	0.025	0.034	0.042	0.050	0.067	0.084	0.101
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	G-Mold 55	Roughing	0.06xD	0.20xD	140	0.013	0.025	0.038	0.051	0.064	0.076	0.102	0.127	0.152
		G-Mold 55	(Pre-)Finishing	0.02xD	0.05xD	220	0.009	0.018	0.027	0.036	0.044	0.053	0.071	0.089	0.107
		G-Mold 55	Fine finishing	0.01xD	0.02xD	220	0.009	0.018	0.027	0.036	0.044	0.053	0.071	0.089	0.107
	55-65 HRC	G-Mold 65	Roughing	0.06xD	0.20xD	100	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120
		G-Mold 65	(Pre-)Finishing	0.02xD	0.05xD	170	0.007	0.014	0.021	0.028	0.035	0.042	0.056	0.070	0.084
		G-Mold 65	Fine finishing	0.01xD	0.02xD	170	0.007	0.013	0.020	0.026	0.033	0.039	0.052	0.065	0.078
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	G-Mold 55	Roughing	0.10xD	0.30xD	160	0.013	0.026	0.039	0.052	0.065	0.078	0.104	0.130	0.156
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	230	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
		G-Mold 55	Fine finishing	0.01xD	0.02xD	240	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	G-Mold 55	Roughing	0.06xD	0.20xD	110	0.012	0.024	0.036	0.048	0.060	0.072	0.096	0.120	0.144
		G-Mold 55	(Pre-)Finishing	0.02xD	0.05xD	160	0.008	0.017	0.025	0.034	0.042	0.050	0.067	0.084	0.101
		G-Mold 55	Fine finishing	0.01xD	0.02xD	170	0.008	0.016	0.023	0.031	0.039	0.047	0.062	0.078	0.094
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	G-Mold 55	Roughing	0.06xD	0.20xD	80	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120
		G-Mold 55	(Pre-)Finishing	0.02xD	0.05xD	120	0.007	0.014	0.021	0.028	0.035	0.042	0.056	0.070	0.084
		G-Mold 55	Fine finishing	0.01xD	0.02xD	130	0.007	0.013	0.020	0.026	0.033	0.039	0.052	0.065	0.078
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	G-Mold 55	Roughing	0.06xD	0.20xD	45	0.012	0.024	0.036	0.048	0.061	0.073	0.097	0.121	0.145
		G-Mold 55	(Pre-)Finishing	0.02xD	0.05xD	60	0.008	0.017	0.025	0.034	0.042	0.051	0.068	0.085	0.102
		G-Mold 55	Fine finishing	0.01xD	0.02xD	80	0.008	0.016	0.024	0.031	0.039	0.047	0.063	0.079	0.094
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	G-Mold 55	Roughing	0.06xD	0.20xD	90	0.013	0.026	0.039	0.052	0.065	0.078	0.104	0.130	0.156
		G-Mold 55	(Pre-)Finishing	0.02xD	0.05xD	130	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
		G-Mold 55	Fine finishing	0.01xD	0.02xD	140	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	G-Mold 55	Roughing	0.10xD	0.30xD	220	0.015	0.030	0.045	0.060	0.075	0.090	0.120	0.150	0.180
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	310	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
		G-Mold 55	Fine finishing	0.01xD	0.02xD	330	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	G-Mold 55	Roughing	0.10xD	0.30xD	155	0.012	0.023	0.035	0.047	0.059	0.070	0.094	0.117	0.140
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	210	0.008	0.016	0.025	0.033	0.041	0.049	0.066	0.082	0.098
		G-Mold 55	Fine finishing	0.01xD	0.02xD	240	0.008	0.016	0.025	0.033	0.041	0.049	0.066	0.082	0.098
Aluminium, Al-wrought alloys, Al-alloys 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 7% Si	G-Mold 55	Roughing	0.10xD	0.30xD	600	0.016	0.032	0.048	0.064	0.080	0.096	0.128	0.160	0.192
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	800	0.011	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134
		G-Mold 55	Fine finishing	0.01xD	0.02xD	900	0.011	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 7% Si	G-Mold 55	Roughing	0.10xD	0.30xD	300	0.015	0.030	0.045	0.060	0.075	0.090	0.120	0.150	0.180
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	400	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
		G-Mold 55	Fine finishing	0.01xD	0.02xD	500	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	G-Mold 55	Roughing	0.10xD	0.30xD	180	0.013	0.026	0.039	0.052	0.065	0.078	0.104	0.130	0.156
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	260	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
		G-Mold 55	Fine finishing	0.01xD	0.02xD	270	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
Non-ferr. met. (copper, short-/long-chipp., brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	G-Mold 55	Roughing	0.10xD	0.30xD	200	0.016	0.032	0.048	0.064	0.080	0.096	0.128	0.160	0.192
		G-Mold 55	(Pre-)Finishing	0.05xD	0.10xD	280	0.011	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134
		G-Mold 55	Fine finishing	0.01xD	0.02xD	300	0.011	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134

Milling conditions:

- HSC — stable machining conditions, low cutting depth, high cutting values
- short tools
- long tools

Correction factors:

medium length tools	v_c -25%	f_z -25%
extra length tools	v_c -50%	f_z -50%
uncoated tools	v_c -60%	f_z -25%



Material	Hardness	Type	Application	a_p max.	a_e max.	v_c	f_z (mm/tooth) with nom. Ø 1	2	3	4	5	6	8	10	12
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	G-Mold 55	Roughing	0.05xD	0.40xD	156	0.015	0.030	0.045	0.060	0.075	0.090	0.120	0.150	0.180
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	220	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
		G-Mold 55	Fine finishing	0.01xD	0.15xD	230	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	G-Mold 55	Roughing	0.05xD	0.40xD	143	0.015	0.030	0.045	0.060	0.075	0.090	0.120	0.150	0.180
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	210	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
		G-Mold 55	Fine finishing	0.01xD	0.15xD	210	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	G-Mold 55	Roughing	0.05xD	0.40xD	130	0.012	0.024	0.036	0.048	0.060	0.072	0.096	0.120	0.144
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	190	0.008	0.017	0.025	0.034	0.042	0.050	0.067	0.084	0.101
		G-Mold 55	Fine finishing	0.01xD	0.15xD	190	0.008	0.017	0.025	0.034	0.042	0.050	0.067	0.084	0.101
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	G-Mold 55	Roughing	0.04xD	0.30xD	90	0.013	0.025	0.038	0.051	0.064	0.076	0.102	0.127	0.152
		G-Mold 55	(Pre-)Finishing	0.03xD	0.20xD	140	0.009	0.018	0.027	0.036	0.044	0.053	0.071	0.089	0.107
		G-Mold 55	Fine finishing	0.01xD	0.15xD	140	0.009	0.018	0.027	0.036	0.044	0.053	0.071	0.089	0.107
	55-65 HRC	G-Mold 65	Roughing	0.03xD	0.25xD	70	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120
		G-Mold 65	(Pre-)Finishing	0.02xD	0.20xD	110	0.007	0.014	0.021	0.028	0.035	0.042	0.056	0.070	0.084
		G-Mold 65	Fine finishing	0.01xD	0.10xD	120	0.007	0.013	0.020	0.026	0.033	0.039	0.052	0.065	0.078
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	G-Mold 55	Roughing	0.05xD	0.40xD	105	0.013	0.026	0.039	0.052	0.065	0.078	0.104	0.130	0.156
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	150	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
		G-Mold 55	Fine finishing	0.01xD	0.15xD	150	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	G-Mold 55	Roughing	0.04xD	0.30xD	75	0.012	0.024	0.036	0.048	0.060	0.072	0.096	0.120	0.144
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	110	0.008	0.017	0.025	0.034	0.042	0.050	0.067	0.084	0.101
		G-Mold 55	Fine finishing	0.01xD	0.10xD	120	0.008	0.016	0.023	0.031	0.039	0.047	0.062	0.078	0.094
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	G-Mold 55	Roughing	0.04xD	0.25xD	55	0.010	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120
		G-Mold 55	(Pre-)Finishing	0.03xD	0.20xD	80	0.007	0.014	0.021	0.028	0.035	0.042	0.056	0.070	0.084
		G-Mold 55	Fine finishing	0.01xD	0.10xD	90	0.007	0.013	0.020	0.026	0.033	0.039	0.052	0.065	0.078
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	G-Mold 55	Roughing	0.04xD	0.25xD	30	0.012	0.024	0.036	0.048	0.061	0.073	0.097	0.121	0.145
		G-Mold 55	(Pre-)Finishing	0.03xD	0.20xD	40	0.008	0.017	0.025	0.034	0.042	0.051	0.068	0.085	0.102
		G-Mold 55	Fine finishing	0.01xD	0.10xD	50	0.008	0.016	0.024	0.031	0.039	0.047	0.063	0.079	0.094
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	G-Mold 55	Roughing	0.05xD	0.30xD	60	0.013	0.026	0.039	0.052	0.065	0.078	0.104	0.130	0.156
		G-Mold 55	(Pre-)Finishing	0.03xD	0.20xD	90	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
		G-Mold 55	Fine finishing	0.01xD	0.15xD	90	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	G-Mold 55	Roughing	0.05xD	0.40xD	140	0.015	0.030	0.045	0.060	0.075	0.090	0.120	0.150	0.180
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	200	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
		G-Mold 55	Fine finishing	0.01xD	0.15xD	210	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	G-Mold 55	Roughing	0.05xD	0.40xD	100	0.012	0.023	0.035	0.047	0.059	0.070	0.094	0.117	0.140
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	140	0.008	0.016	0.025	0.033	0.041	0.049	0.066	0.082	0.098
		G-Mold 55	Fine finishing	0.01xD	0.15xD	150	0.008	0.016	0.025	0.033	0.041	0.049	0.066	0.082	0.098
Aluminium, Al-wrought alloys, Al-alloys 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 7% Si	G-Mold 55	Roughing	0.05xD	0.40xD	390	0.016	0.032	0.048	0.064	0.080	0.096	0.128	0.160	0.192
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	500	0.011	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134
		G-Mold 55	Fine finishing	0.01xD	0.15xD	500	0.011	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 7% Si	G-Mold 55	Roughing	0.05xD	0.40xD	155	0.015	0.030	0.045	0.060	0.075	0.090	0.120	0.150	0.180
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	200	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
		G-Mold 55	Fine finishing	0.01xD	0.15xD	300	0.011	0.021	0.032	0.042	0.053	0.063	0.084	0.105	0.126
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	G-Mold 55	Roughing	0.05xD	0.40xD	115	0.013	0.026	0.039	0.052	0.065	0.078	0.104	0.130	0.156
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	170	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
		G-Mold 55	Fine finishing	0.01xD	0.15xD	170	0.009	0.018	0.027	0.036	0.046	0.055	0.073	0.091	0.109
Non-ferr. met. (copper, short-/long-chipp., brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	G-Mold 55	Roughing	0.05xD	0.40xD	130	0.016	0.032	0.048	0.064	0.080	0.096	0.128	0.160	0.192
		G-Mold 55	(Pre-)Finishing	0.03xD	0.25xD	190	0.011	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134
		G-Mold 55	Fine finishing	0.01xD	0.15xD	100	0.011	0.022	0.034	0.045	0.056	0.067	0.090	0.112	0.134

Milling conditions:

HSC stable machining conditions
low cutting depth, high cutting values

long tools

Correction factors:

medium length tools	v_c -25% f_z -25% a_p max. -20%
extra length tools	v_c -50% f_z -50% a_p max. -50%



Material	Hard-ness	Application	a_e max.	v_c	f_z (mm/tooth) with nom. Ø								
					1	2	3	4	6	8	10	12	16
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	Slotting	1.00xD	200	0.035	0.070	0.105	0.140	0.240	0.320	0.40	0.48	0.64
		Roughing	0.60xD	250	0.042	0.084	0.126	0.168	0.288	0.384	0.48	0.58	0.77
		Pre-finishing	0.40xD	300	0.032	0.063	0.095	0.126	0.216	0.288	0.36	0.43	0.58
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	Slotting	1.00xD	170	0.030	0.060	0.090	0.120	0.210	0.280	0.35	0.42	0.56
		Roughing	0.60xD	220	0.036	0.072	0.108	0.144	0.252	0.336	0.42	0.50	0.67
		Pre-finishing	0.40xD	250	0.027	0.054	0.081	0.108	0.189	0.252	0.32	0.38	0.50
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	Slotting	1.00xD	130	0.025	0.050	0.075	0.100	0.180	0.240	0.30	0.36	0.48
		Roughing	0.60xD	170	0.030	0.060	0.090	0.120	0.216	0.288	0.36	0.43	0.58
		Pre-finishing	0.40xD	190	0.023	0.045	0.068	0.090	0.162	0.216	0.27	0.32	0.43
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	Slotting	1.00xD	100	0.020	0.040	0.060	0.080	0.150	0.200	0.25	0.30	0.40
		Roughing	0.40xD	120	0.024	0.048	0.072	0.096	0.180	0.240	0.30	0.36	0.48
		Pre-finishing	0.30xD	150	0.018	0.036	0.054	0.072	0.135	0.180	0.23	0.27	0.36
	55-65 HRC	Slotting	1.00xD	60	0.010	0.020	0.030	0.040	0.090	0.120	0.15	0.18	0.24
		Roughing	0.30xD	90	0.012	0.024	0.036	0.048	0.108	0.144	0.18	0.22	0.29
		Pre-finishing	0.20xD	100	0.009	0.018	0.027	0.036	0.081	0.108	0.14	0.16	0.22
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	Slotting	1xD	100	0.030	0.060	0.090	0.120	0.210	0.280	0.35	0.42	0.56
		Roughing	0.40xD	130	0.036	0.072	0.108	0.144	0.252	0.336	0.42	0.50	0.67
		Pre-finishing	0.30xD	150	0.027	0.054	0.081	0.108	0.189	0.252	0.32	0.38	0.50
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	Slotting	1xD	80	0.027	0.054	0.081	0.108	0.192	0.256	0.32	0.38	0.51
		Roughing	0.40xD	100	0.032	0.065	0.097	0.130	0.230	0.307	0.38	0.46	0.61
		Pre-finishing	0.30xD	120	0.024	0.049	0.073	0.097	0.173	0.230	0.29	0.35	0.46
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	Slotting	1xD	60	0.020	0.040	0.060	0.080	0.150	0.200	0.25	0.30	0.40
		Roughing	0.40xD	70	0.024	0.048	0.072	0.096	0.180	0.240	0.30	0.36	0.48
		Pre-finishing	0.30xD	90	0.018	0.036	0.054	0.072	0.135	0.180	0.23	0.27	0.36
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	Slotting	1xD	30	0.010	0.020	0.030	0.040	0.090	0.120	0.15	0.18	0.24
		Roughing	0.30xD	35	0.012	0.024	0.036	0.048	0.108	0.144	0.18	0.22	0.29
		Pre-finishing	0.20xD	40	0.009	0.018	0.027	0.036	0.081	0.108	0.14	0.16	0.22
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	Slotting	1xD	60	0.020	0.040	0.060	0.080	0.150	0.200	0.25	0.30	0.40
		Roughing	0.40xD	80	0.024	0.048	0.072	0.096	0.180	0.240	0.30	0.36	0.48
		Pre-finishing	0.30xD	90	0.018	0.036	0.054	0.072	0.135	0.180	0.23	0.27	0.36
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	Slotting	1.00xD	170	0.030	0.060	0.090	0.120	0.210	0.280	0.35	0.42	0.56
		Roughing	0.60xD	220	0.036	0.072	0.108	0.144	0.252	0.336	0.42	0.50	0.67
		Pre-finishing	0.40xD	250	0.027	0.054	0.081	0.108	0.189	0.252	0.32	0.38	0.50
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	Slotting	1.00xD	140	0.027	0.054	0.081	0.108	0.192	0.256	0.32	0.38	0.51
		Roughing	0.60xD	180	0.032	0.065	0.097	0.130	0.230	0.307	0.38	0.46	0.61
		Pre-finishing	0.40xD	210	0.024	0.049	0.073	0.097	0.173	0.230	0.29	0.35	0.46

Material	Hardness	a_p max. (mm) with nom. Ø								
		1	2	3	4	6	8	10	12	16
P	less than 850 N/mm²	0.06	0.12	0.18	0.24	0.36	0.48	0.60	0.72	0.96
	more than 850 N/mm²	0.05	0.10	0.15	0.20	0.30	0.40	0.50	0.60	0.80
K	less than 240 HB	0.06	0.12	0.18	0.24	0.36	0.48	0.60	0.72	0.96
	more than 240 HB	0.05	0.10	0.15	0.20	0.30	0.40	0.50	0.60	0.80
H	less than 55 HRC	0.04	0.08	0.12	0.16	0.24	0.32	0.40	0.48	0.64
	55-65 HRC	0.03	0.07	0.10	0.12	0.18	0.24	0.30	0.36	0.48
M	less than 850 N/mm²	0.04	0.08	0.12	0.16	0.24	0.32	0.40	0.48	0.64
	more than 850 N/mm²	0.03	0.07	0.10	0.12	0.18	0.24	0.30	0.36	0.48
S	Ti alloys	0.03	0.07	0.10	0.12	0.18	0.24	0.30	0.36	0.48

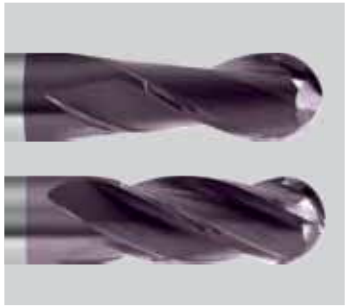
Milling conditions:

HSC stable machining conditions
low cutting depth, high cutting values

long tools

Correction factors:

	v_c	f_z
extra length tools	-50%	-50%
uncoated tools	-50%	-25%



Material	Hard-ness	Type	Application	a_p/a_e max.	v_c	f_z (mm/tooth) with nom. Ø								
						1	2	4	5	6	8	10	12	16
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	Z2/Z4	Roughing	0.10xD	175	0.004	0.008	0.016	0.020	0.025	0.034	0.04	0.05	0.07
		Z2/Z4	(Pre-)Finishing	0.03xD	250	0.003	0.006	0.011	0.014	0.018	0.024	0.03	0.04	0.05
		Z2/Z4	Fine finishing	0.01xD	280	0.002	0.005	0.010	0.012	0.015	0.020	0.03	0.03	0.04
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	Z2/Z4	Roughing	0xD	175	0.004	0.008	0.016	0.020	0.025	0.034	0.04	0.05	0.07
		Z2/Z4	(Pre-)Finishing	0.03xD	250	0.003	0.006	0.011	0.014	0.018	0.024	0.03	0.04	0.05
		Z2/Z4	Fine finishing	0.02xD	280	0.003	0.005	0.010	0.013	0.016	0.022	0.03	0.03	0.04
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	Z2/Z4	Roughing	0xD	140	0.004	0.008	0.015	0.019	0.024	0.032	0.04	0.05	0.06
		Z2/Z4	(Pre-)Finishing	0.02xD	220	0.003	0.005	0.011	0.013	0.017	0.022	0.03	0.03	0.04
		Z2/Z4	Fine finishing	0.02xD	220	0.002	0.005	0.010	0.012	0.016	0.021	0.03	0.03	0.04
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC													
	55-65 HRC													
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	Z2/Z4	Roughing	0.10xD	120	0.004	0.007	0.014	0.018	0.023	0.030	0.04	0.05	0.06
		Z2/Z4	(Pre-)Finishing	0.03xD	170	0.003	0.005	0.010	0.013	0.016	0.021	0.03	0.03	0.04
		Z2/Z4	Fine finishing	0.01xD	190	0.002	0.004	0.009	0.011	0.014	0.018	0.02	0.03	0.04
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	Z2/Z4	Roughing	0.10xD	90	0.003	0.007	0.013	0.017	0.021	0.028	0.04	0.04	0.06
		Z2/Z4	(Pre-)Finishing	0.03xD	130	0.002	0.005	0.009	0.012	0.015	0.020	0.02	0.03	0.04
		Z2/Z4	Fine finishing	0.01xD	140	0.002	0.004	0.008	0.010	0.013	0.017	0.02	0.03	0.03
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	Z2/Z4	Roughing	0.10xD	55	0.003	0.006	0.012	0.016	0.020	0.026	0.03	0.04	0.05
		Z2/Z4	(Pre-)Finishing	0.02xD	80	0.002	0.004	0.009	0.011	0.014	0.018	0.02	0.03	0.04
		Z2/Z4	Fine finishing	0.01xD	100	0.002	0.004	0.007	0.009	0.012	0.016	0.02	0.02	0.03
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	Z2/Z4	Roughing	0.10xD	30	0.003	0.005	0.010	0.013	0.017	0.022	0.03	0.03	0.04
		Z2/Z4	(Pre-)Finishing	0.02xD	40	0.002	0.004	0.007	0.009	0.012	0.016	0.02	0.02	0.03
		Z2/Z4	Fine finishing	0.01xD	50	0.002	0.003	0.006	0.008	0.010	0.013	0.02	0.02	0.03
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	Z2/Z4	Roughing	0.10xD	55	0.004	0.007	0.014	0.018	0.023	0.030	0.04	0.05	0.06
		Z2/Z4	(Pre-)Finishing	0.02xD	80	0.003	0.005	0.010	0.013	0.016	0.021	0.03	0.03	0.04
		Z2/Z4	Fine finishing	0.01xD	100	0.002	0.004	0.009	0.011	0.014	0.018	0.02	0.03	0.04
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	Z2/Z4	Roughing	0.10xD	140	0.004	0.008	0.016	0.020	0.025	0.034	0.04	0.05	0.07
		Z2/Z4	(Pre-)Finishing	0.03xD	200	0.003	0.006	0.011	0.014	0.018	0.024	0.03	0.04	0.05
		Z2/Z4	Fine finishing	0.01xD	230	0.002	0.005	0.010	0.012	0.015	0.020	0.03	0.03	0.04
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	Z2/Z4	Roughing	0.10xD	110	0.004	0.008	0.015	0.019	0.024	0.032	0.04	0.05	0.06
		Z2/Z4	(Pre-)Finishing	0.02xD	170	0.003	0.005	0.011	0.013	0.017	0.022	0.03	0.03	0.04
		Z2/Z4	Fine finishing	0.01xD	190	0.002	0.005	0.009	0.011	0.014	0.019	0.02	0.03	0.04
Aluminium, Al-wrought alloys, Al-alloys 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 7% Si													
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 7% Si	Z2/Z4	Roughing	0.10xD	200	0.005	0.010	0.019	0.024	0.030	0.040	0.05	0.06	0.08
		Z2/Z4	(Pre-)Finishing	0.03xD	280	0.003	0.007	0.013	0.017	0.021	0.028	0.04	0.04	0.06
		Z2/Z4	Fine finishing	0.01xD	400	0.003	0.006	0.012	0.014	0.018	0.024	0.03	0.04	0.05
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-													
Non-ferr. met. (copper, short-/long-chipp., brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	Z2/Z4	Roughing	0.10xD	175	0.004	0.008	0.015	0.019	0.024	0.032	0.04	0.05	0.06
		Z2/Z4	(Pre-)Finishing	0.03xD	250	0.003	0.005	0.011	0.013	0.017	0.022	0.03	0.03	0.04
		Z2/Z4	Fine finishing	0.01xD	200	0.002	0.005	0.009	0.011	0.014	0.019	0.02	0.03	0.04



RF 100 diver

SLOTTING

	Material/ISO material	Hardness	a_p max.	a_e max.	v_c	f_z (mm/tooth) with nom. Ø							
						4	5	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	≤ 850 N/mm²	1xD	1xD	270	0.017	0.021	0.025	0.034	0.050	0.060	0.080	0.100
P	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850-1200 N/mm²	1xD	1xD	230	0.017	0.021	0.025	0.034	0.050	0.060	0.080	0.100
P	Alloyed heat-treatable, tool and high speed steels	850-1400 N/mm²	1xD	1xD	180	0.014	0.018	0.021	0.028	0.045	0.054	0.072	0.090
M	Stainless steel - easy to machine / sulphured	≤ 750 N/mm²	1xD	1xD	120	0.014	0.018	0.021	0.028	0.045	0.054	0.072	0.090
M	Stainless steel - moderately difficult to machine	750-950 N/mm²	1xD	1xD	80	0.013	0.016	0.019	0.026	0.040	0.048	0.064	0.080
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	≥ 240 HB	1xD	1xD	150	0.017	0.021	0.025	0.034	0.050	0.060	0.080	0.100
N	Aluminium, Al-wrought alloys, Al-alloys	≤ 7% Si	1xD	1xD	500	0.022	0.028	0.033	0.044	0.065	0.078	0.104	0.130
N	Aluminium-cast alloys	≥ 7% Si	1xD	1xD	340	0.018	0.023	0.027	0.036	0.055	0.066	0.088	0.110
S	Titanium, Titanium alloys	≤ 1300 N/mm²	1xD	1xD	60	0.013	0.016	0.019	0.026	0.040	0.048	0.064	0.080

HPC ROUGHING

	Material/ISO material	Hardness	a_p max.	a_e max.	v_c	f_z (mm/tooth) with nom. Ø							
						4	5	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	≤ 850 N/mm²	1.5xD	0.40xD	350	0.021	0.026	0.032	0.042	0.063	0.075	0.100	0.125
P	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850-1200 N/mm²	1.5xD	0.40xD	290	0.021	0.026	0.032	0.042	0.063	0.075	0.100	0.125
P	Alloyed heat-treatable, tool and high speed steels	850-1400 N/mm²	1.5xD	0.33xD	260	0.018	0.023	0.027	0.036	0.059	0.070	0.094	0.117
M	Stainless steel - easy to machine / sulphured	≤ 750 N/mm²	1.5xD	0.33xD	160	0.018	0.023	0.027	0.036	0.059	0.070	0.094	0.117
M	Stainless steel - moderately difficult to machine	750-950 N/mm²	1.5xD	0.25xD	120	0.019	0.024	0.029	0.038	0.060	0.072	0.096	0.120
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	≥ 240 HB	1.5xD	0.40xD	190	0.021	0.026	0.032	0.042	0.063	0.075	0.100	0.125
N	Aluminium, Al-wrought alloys, Al-alloys	≤ 7% Si	1.5xD	0.40xD	600	0.028	0.034	0.041	0.055	0.081	0.098	0.130	0.163
N	Aluminium-cast alloys	≥ 7% Si	1.5xD	0.40xD	440	0.023	0.028	0.034	0.045	0.069	0.083	0.110	0.138
S	Titanium, Titanium alloys	≤ 1300 N/mm²	1.5xD	0.33xD	110	0.017	0.021	0.025	0.033	0.052	0.062	0.083	0.104

HPC FINISHING

	Material/ISO material	Hardness	a_p max.	a_e max.	v_c	f_z (mm/tooth) with nom. Ø							
						4	5	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	≤ 850 N/mm²	2xD	0,02xD	540	0.018	0.023	0.028	0.037	0.055	0.066	0.088	0.110
P	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850-1200 N/mm²	2xD	0,02xD	460	0.018	0.023	0.028	0.037	0.055	0.066	0.088	0.110
P	Alloyed heat-treatable, tool and high speed steels	850-1400 N/mm²	2xD	0,02xD	350	0.015	0.019	0.023	0.031	0.050	0.059	0.079	0.099
M	Stainless steel - easy to machine / sulphured	≤ 750 N/mm²	2xD	0,02xD	220	0.015	0.019	0.023	0.031	0.050	0.059	0.079	0.099
M	Stainless steel - moderately difficult to machine	750-950 N/mm²	2xD	0,02xD	160	0.014	0.018	0.021	0.028	0.044	0.053	0.070	0.088
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	≥ 240 HB	2xD	0,02xD	300	0.018	0.023	0.028	0.037	0.055	0.066	0.088	0.110
N	Aluminium, Al-wrought alloys, Al-alloys	≤ 7% Si	2xD	0,02xD	1000	0.024	0.030	0.036	0.048	0.072	0.086	0.114	0.143
N	Aluminium-cast alloys	≥ 7% Si	2xD	0,02xD	680	0.020	0.025	0.030	0.040	0.061	0.073	0.097	0.121
S	Titanium, Titanium alloys	≤ 1300 N/mm²	2xD	0,02xD	130	0.014	0.018	0.021	0.028	0.044	0.053	0.070	0.088

RAMPING, HELIX, GROOVING

	Material/ISO material	Hardness	a_p	max. ramping angle	v_c	f_z (mm/tooth) with nom. Ø							
						4	5	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	≤ 850 N/mm²	1xD	45°	270	0.015	0.019	0.023	0.030	0.045	0.054	0.072	0.090
P	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850-1200 N/mm²	1xD	45°	230	0.013	0.017	0.020	0.026	0.040	0.048	0.064	0.080
P	Alloyed heat-treatable, tool and high speed steels	850-1400 N/mm²	1xD	30°	180	0.011	0.014	0.017	0.022	0.030	0.036	0.048	0.060
M	Stainless steel - easy to machine / sulphured	≤ 750 N/mm²	1xD	10°	120	0.009	0.012	0.014	0.018	0.030	0.036	0.048	0.060
M	Stainless steel - moderately difficult to machine	750-950 N/mm²	1xD	5°	80	0.007	0.009	0.011	0.014	0.025	0.030	0.040	0.050
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	≥ 240 HB	1xD	45°	150	0.015	0.019	0.023	0.030	0.045	0.054	0.072	0.090
N	Aluminium, Al-wrought alloys, Al-alloys	≤ 7% Si	1xD	30°	500	0.013	0.017	0.020	0.026	0.040	0.048	0.064	0.080
N	Aluminium-cast alloys	≥ 7% Si	1xD	45°	340	0.015	0.019	0.023	0.030	0.045	0.054	0.072	0.090
S	Titanium, Titanium alloys	≤ 1300 N/mm²	1xD	10°	60	0.007	0.009	0.011	0.014	0.025	0.030	0.040	0.050

DRILLING

	Material/ISO material	Hardness	max. drilling depth without chip removal	v_c	f_z (mm/tooth) with nom. Ø							
					4	5	6	8	10	12	16	20
P	Struct./free-cutting steels, unall. heat-treat./case hard. steels	≤ 850 N/mm²	1.5xD	270	0.014	0.018	0.021	0.028	0.040	0.048	0.064	0.080
P	Free-cutting steels, unalloyed case hard. steels, nitr. steels	850-1200 N/mm²	1.5xD	230	0.012	0.015	0.018	0.024	0.035	0.042	0.056	0.070
P	Alloyed heat-treatable, tool and high speed steels	850-1400 N/mm²	1.0xD	180	0.008	0.010	0.012	0.016	0.025	0.030	0.040	0.050
K	Cast iron, grey cast iron, spher. graphite/malleable cast iron	≥ 240 HB	1.5xD	150	0.014	0.018	0.021	0.028	0.040	0.048	0.064	0.080
N	Aluminium, Al-wrought alloys, Al-alloys	≤ 7% Si	1.0xD	500	0.012	0.015	0.018	0.024	0.035	0.042	0.056	0.070
N	Aluminium-cast alloys	≥ 7% Si	1.0xD	340	0.014	0.018	0.021	0.028	0.040	0.048	0.064	0.080



RF 100 SPEED | RF 100 5 SPEED

SLOTTING

Milling conditions	Material	Machinability	a_p max.	a_e max.	max. pressure angle	v_c	f_z (mm/tooth) with nom. Ø								
							3	4	5	6	8	10	12	16	20
HPC	P	light/medial	0.80xD	1.00xD	180°	160	0.014	0.018	0.023	0.027	0.044	0.055	0.066	0.088	0.110
		difficult	0.80xD	1.00xD	180°	125	0.014	0.018	0.023	0.027	0.040	0.050	0.060	0.080	0.100
	M	light/medial	0.80xD	1.00xD	180°	85	0.011	0.014	0.018	0.021	0.028	0.035	0.042	0.056	0.070
		difficult	0.80xD	1.00xD	180°	55	0.011	0.014	0.018	0.021	0.028	0.035	0.042	0.056	0.070
	S	medial/difficult	0.80xD	1.00xD	180°	45	0.011	0.014	0.018	0.021	0.028	0.035	0.042	0.056	0.070
		very difficult	0.80xD	1.00xD	180°	30	0.009	0.012	0.015	0.018	0.024	0.030	0.036	0.048	0.060

ROUGHING

Milling conditions	Material	Machinability	a_p max.	a_e max.	max. pressure angle	v_c	f_z (mm/tooth) with nom. Ø								
							3	4	5	6	8	10	12	16	20
HPC	P	light/medial	L2	0.20xD	53°	270	0.022	0.029	0.036	0.043	0.070	0.088	0.106	0.141	0.176
		difficult	L2	0.20xD	53°	210	0.022	0.029	0.036	0.043	0.064	0.080	0.096	0.128	0.160
	M	light/medial	L2	0.15xD	46°	150	0.020	0.027	0.033	0.040	0.053	0.067	0.080	0.106	0.133
		difficult	L2	0.10xD	37°	100	0.024	0.032	0.040	0.048	0.064	0.081	0.097	0.129	0.161
	S	medial/difficult	L2	0.08xD	31°	90	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.140	0.175
		very difficult	L2	0.08xD	31°	60	0.023	0.030	0.038	0.045	0.060	0.075	0.090	0.120	0.150

ROUGHING

Milling conditions	Material	Machinability	a_p max.	a_e max.	max. pressure angle	v_c	f_z (mm/tooth) with nom. Ø								
							3	4	5	6	8	10	12	16	20
HSC	P	light/medial	L2	0.15xD	46°	290	0.026	0.034	0.043	0.051	0.084	0.105	0.125	0.167	0.209
		difficult	L2	0.15xD	46°	230	0.026	0.034	0.043	0.051	0.076	0.095	0.114	0.152	0.190
	M	light/medial	L2	0.10xD	37°	170	0.024	0.032	0.040	0.048	0.064	0.081	0.097	0.129	0.161
		difficult	L2	0.08xD	31°	110	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.140	0.175
	S	medial/difficult	L2	0.05xD	26°	100	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.140	0.175
		very difficult	L2	0.05xD	26°	70	0.023	0.030	0.038	0.045	0.060	0.075	0.090	0.120	0.150

FINISHING

Milling conditions	Material	Machinability	a_p max.	a_e max.	max. pressure angle	v_c	f_z (mm/tooth) with nom. Ø								
							3	4	5	6	8	10	12	16	20
HSC	P	light/medial	L2	0.02xD	18°	320	0.019	0.025	0.032	0.038	0.062	0.077	0.092	0.123	0.154
		difficult	L2	0.02xD	18°	250	0.019	0.025	0.032	0.038	0.056	0.070	0.084	0.112	0.140
	M	light/medial	L2	0.02xD	18°	170	0.015	0.020	0.025	0.029	0.039	0.049	0.059	0.078	0.098
		difficult	L2	0.01xD	11°	120	0.019	0.025	0.032	0.038	0.050	0.063	0.076	0.101	0.126
	S	medial/difficult	L2	0.01xD	11°	100	0.019	0.025	0.032	0.038	0.050	0.063	0.076	0.101	0.126
		very difficult	L2	0.01xD	11°	70	0.016	0.022	0.027	0.032	0.043	0.054	0.065	0.086	0.108



RF 100 SPEED | RF 100 5 SPEED | RF 100 7 SPEED | 3xD

ROUGHING

Milling conditions	Material	Machinability	a_p max.	a_e max.	max. pressure angle	v_c	f_z (mm/tooth) with nom. Ø								
							3	4	5	6	8	10	12	16	20
HPC	P	light/medial	L2	0.15xD	46°	280	0.026	0.034	0.043	0.051	0.084	0.105	0.125	0.167	0.209
		difficult	L2	0.15xD	46°	220	0.026	0.034	0.043	0.051	0.076	0.095	0.114	0.152	0.190
	M	light/medial	L2	0.10xD	37°	160	0.024	0.032	0.040	0.048	0.064	0.081	0.097	0.129	0.161
		difficult	L2	0.10xD	37°	100	0.024	0.032	0.040	0.048	0.064	0.081	0.097	0.129	0.161
	S	medial/difficult	L2	0.08xD	31°	90	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.140	0.175
		very difficult	L2	0.08xD	31°	60	0.023	0.030	0.038	0.045	0.060	0.075	0.090	0.120	0.150

ROUGHING

Milling conditions	Material	Machinability	a_p max.	a_e max.	max. pressure angle	v_c	f_z (mm/tooth) with nom. Ø								
							3	4	5	6	8	10	12	16	20
HSC	P	light/medial	L2	0.10xD	37°	310	0.031	0.041	0.052	0.062	0.101	0.127	0.152	0.202	0.253
		difficult	L2	0.10xD	37°	240	0.031	0.041	0.052	0.062	0.092	0.115	0.138	0.184	0.230
	M	light/medial	L2	0.08xD	31°	170	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.140	0.175
		difficult	L2	0.08xD	31°	110	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.140	0.175
	S	medial/difficult	L2	0.05xD	26°	100	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.140	0.175
		very difficult	L2	0.05xD	26°	70	0.023	0.030	0.038	0.045	0.060	0.075	0.090	0.120	0.150

FINISHING

Milling conditions	Material	Machinability	a_p max.	a_e max.	max. pressure angle	v_c	f_z (mm/tooth) with nom. Ø								
							3	4	5	6	8	10	12	16	20
HSC	P	light/medial	L2	0.01xD	11°	340	0.024	0.032	0.041	0.049	0.079	0.099	0.119	0.158	0.198
		difficult	L2	0.01xD	11°	270	0.024	0.032	0.041	0.049	0.072	0.090	0.108	0.144	0.180
	M	light/medial	L2	0.01xD	11°	180	0.019	0.025	0.032	0.038	0.050	0.063	0.076	0.101	0.126
		difficult	L2	0.01xD	11°	120	0.019	0.025	0.032	0.038	0.050	0.063	0.076	0.101	0.126
	S	medial/difficult	L2	0.01xD	11°	100	0.019	0.025	0.032	0.038	0.050	0.063	0.076	0.101	0.126
		very difficult	L2	0.01xD	11°	70	0.016	0.022	0.027	0.032	0.043	0.054	0.065	0.086	0.108

Milling conditions:

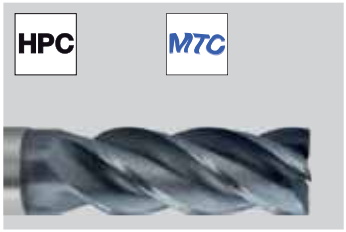
HPC stable machining conditions high drive power

M7C unstable machining conditions low drive power

long tools

Correction factors:

	a_p Roughing > 1.5 x D	v_c -25%	f_z -25%
	medium length tools	v_c -40%	f_z -40%



Material	Hard-ness	Application	a_e max.	v_c	f_z (mm/tooth) with nom. Ø								
					1	3	4	6	8	10	12	16	20
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	Slotting	1xD	180	0.010	0.016	0.021	0.031	0.042	0.060	0.072	0.10	0.12
		Roughing	0.75xD	210	0.011	0.018	0.024	0.036	0.048	0.069	0.083	0.11	0.14
		Finishing	0.02xD	360	0.011	0.017	0.023	0.034	0.046	0.066	0.079	0.11	0.13
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	Slotting	1xD	160	0.009	0.014	0.019	0.029	0.038	0.055	0.066	0.09	0.11
		Roughing	0.75xD	190	0.010	0.017	0.022	0.033	0.044	0.063	0.076	0.10	0.13
		Finishing	0.02xD	320	0.010	0.016	0.021	0.032	0.042	0.061	0.073	0.10	0.12
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	Slotting	1xD	135	0.008	0.014	0.018	0.027	0.036	0.050	0.060	0.08	0.10
		Roughing	0.75xD	160	0.009	0.016	0.021	0.031	0.041	0.058	0.069	0.09	0.12
		Finishing	0.02xD	270	0.009	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	Slotting	1xD	120	0.006	0.014	0.018	0.027	0.036	0.050	0.060	0.08	0.10
		Roughing	0.75xD	140	0.008	0.016	0.021	0.031	0.041	0.058	0.069	0.09	0.12
		Finishing	0.02xD	240	0.008	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	Slotting	1xD	80	0.005	0.012	0.016	0.024	0.032	0.045	0.054	0.07	0.09
		Roughing	0.75xD	100	0.007	0.014	0.018	0.028	0.037	0.052	0.062	0.08	0.10
		Finishing	0.02xD	160	0.007	0.013	0.018	0.026	0.035	0.050	0.059	0.08	0.10
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	Slotting	1xD	60	0.004	0.011	0.014	0.021	0.028	0.040	0.048	0.06	0.08
		Roughing	0.60xD	80	0.006	0.013	0.017	0.025	0.034	0.048	0.058	0.08	0.10
		Finishing	0.01xD	120	0.007	0.011	0.014	0.021	0.028	0.040	0.048	0.06	0.08
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	Slotting	1xD	30	0.004	0.008	0.011	0.017	0.022	0.032	0.038	0.05	0.06
		Roughing	0.60xD	40	0.006	0.010	0.013	0.020	0.027	0.038	0.046	0.06	0.08
		Finishing	0.01xD	60	0.006	0.008	0.011	0.017	0.022	0.032	0.038	0.05	0.06
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	Slotting	1xD	60	0.005	0.012	0.016	0.024	0.032	0.045	0.054	0.07	0.09
		Roughing	0.60xD	80	0.007	0.014	0.019	0.029	0.038	0.054	0.065	0.09	0.11
		Finishing	0.02xD	120	0.007	0.013	0.018	0.026	0.035	0.050	0.059	0.08	0.10
Aluminium, Alu-Knetlegierungen, Alulegierungen 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 7% Si	Slotting	1xD	500	0.011	0.020	0.026	0.039	0.052	0.080	0.096	0.13	0.16
		Roughing	0.75xD	600	0.012	0.022	0.030	0.045	0.060	0.092	0.110	0.15	0.18
		Finishing	0.02xD	1000	0.012	0.021	0.029	0.043	0.057	0.088	0.106	0.14	0.18
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 7% Si	Slotting	1xD	230	0.010	0.017	0.022	0.033	0.044	0.060	0.072	0.10	0.12
		Roughing	0.75xD	300	0.011	0.019	0.025	0.038	0.051	0.069	0.083	0.11	0.14
		Finishing	0.02xD	460	0.011	0.018	0.024	0.036	0.048	0.066	0.079	0.11	0.13
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	Slotting	1xD	180	0.009	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11
		Roughing	0.75xD	210	0.010	0.017	0.023	0.035	0.046	0.063	0.076	0.10	0.13
		Finishing	0.02xD	360	0.010	0.017	0.022	0.033	0.044	0.061	0.073	0.10	0.12
Non-ferr. met. (copper, short-/long-chipp. brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	Slotting	1xD	250	0.010	0.017	0.022	0.033	0.044	0.060	0.072	0.10	0.12
		Roughing	0.75xD	290	0.011	0.019	0.025	0.038	0.051	0.069	0.083	0.11	0.14
		Finishing	0.02xD	500	0.010	0.018	0.024	0.036	0.048	0.066	0.079	0.11	0.13

Milling conditions:

HPC stable machining conditions high drive power

short tools

long tools

Correction factors:

a_p Roughing > 1.5 x D	v_c -25%	f_z -25%
medium length tools	v_c -40%	f_z -40%
extra length tools	v_c -60%	f_z -55%
uncoated tools	v_c -50%	f_z -25%



Material	Hard-ness	RF 100 Type	Application	a_e max.	v_c	f_z (mm/tooth) with nom. Ø								
						3	4	6	8	10	12	16	20	25
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	U Z3	Slotting	1xD		0.016	0.021	0.031	0.042	0.060	0.072	0.10	0.12	0.15
		F	Roughing	0.75xD	210	0.018	0.024	0.036	0.048	0.069	0.083	0.11	0.14	0.17
		SF	Finishing	0.02xD	360	0.017	0.023	0.034	0.046	0.066	0.079	0.11	0.13	0.17
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	U Z4	Slotting	1xD	160	0.014	0.019	0.029	0.038	0.055	0.066	0.09	0.11	0.14
		U Z4	Roughing	0.75xD	190	0.017	0.022	0.033	0.044	0.063	0.076	0.10	0.13	0.16
		SF	Finishing	0.02xD	320	0.016	0.021	0.032	0.042	0.061	0.073	0.10	0.12	0.15
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	U Z4	Slotting	1xD	135	0.014	0.018	0.027	0.036	0.050	0.060	0.08	0.10	0.13
		U Z4	Roughing	0.75xD	160	0.016	0.021	0.031	0.041	0.058	0.069	0.09	0.12	0.14
		SF	Finishing	0.02xD	270	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11	0.14
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	G-Mold 65 U	Slotting	1xD	70	0.011	0.014	0.021	0.028	0.040	0.048	0.06	0.08	0.10
			Roughing	0.33xD	100	0.014	0.018	0.027	0.036	0.052	0.062	0.08	0.10	0.13
			Finishing	0.01xD	140	0.011	0.014	0.021	0.028	0.040	0.048	0.06	0.08	0.10
	55-65 HRC													
		G-Mold 65 U	Roughing	0.03xD	80	0.021	0.028	0.042	0.056	0.075	0.090	0.12	0.15	0.19
			Finishing	0.005xD	100	0.008	0.010	0.015	0.020	0.027	0.032	0.04	0.05	0.07
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	VA	Slotting	1xD	120	0.014	0.018	0.027	0.036	0.050	0.060	0.08	0.10	0.13
		VA	Roughing	0.75xD	140	0.016	0.021	0.031	0.041	0.058	0.069	0.09	0.12	0.14
		SF	Finishing	0.02xD	240	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11	0.14
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	VA/F	Slotting	1xD	80	0.012	0.016	0.024	0.032	0.045	0.054	0.07	0.09	0.11
		VA/F	Roughing	0.75xD	100	0.014	0.018	0.028	0.037	0.052	0.062	0.08	0.10	0.13
		SF	Finishing	0.02xD	160	0.013	0.018	0.026	0.035	0.050	0.059	0.08	0.10	0.12
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	VA/F	Slotting	1xD	60	0.011	0.014	0.021	0.028	0.040	0.048	0.06	0.08	0.10
		VA/F	Roughing	0.60xD	80	0.013	0.017	0.025	0.034	0.048	0.058	0.08	0.10	0.12
		SF	Finishing	0.01xD	120	0.011	0.014	0.021	0.028	0.040	0.048	0.06	0.08	0.10
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	VA/F	Slotting	1xD	30	0.008	0.011	0.017	0.022	0.032	0.038	0.05	0.06	0.08
		VA/F	Roughing	0.60xD	40	0.010	0.013	0.020	0.027	0.038	0.046	0.06	0.08	0.10
		SF	Finishing	0.01xD	60	0.008	0.011	0.017	0.022	0.032	0.038	0.05	0.06	0.08
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	Ti/VA	Slotting	1xD	60	0.012	0.016	0.024	0.032	0.045	0.054	0.07	0.09	0.11
		Ti/VA	Roughing	0.60xD	80	0.014	0.019	0.029	0.038	0.054	0.065	0.09	0.11	0.14
		SF	Finishing	0.02xD	120	0.013	0.018	0.026	0.035	0.050	0.059	0.08	0.10	0.12
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	U Z4	Slotting	1xD	160	0.017	0.022	0.033	0.044	0.065	0.078	0.10	0.13	0.16
		U Z4	Roughing	0.75xD	190	0.019	0.025	0.038	0.051	0.075	0.090	0.12	0.15	0.19
		SF	Finishing	0.02xD	320	0.018	0.024	0.036	0.048	0.072	0.086	0.11	0.14	0.18
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	U Z4	Slotting	1xD	140	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11	0.14
		U Z4	Roughing	0.75xD	170	0.017	0.023	0.035	0.046	0.063	0.076	0.10	0.13	0.16
		SF	Finishing	0.02xD	280	0.017	0.022	0.033	0.044	0.061	0.073	0.10	0.12	0.15
Aluminium, Al-wrought alloys, Al-alloys 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 7% Si	A	Slotting	1xD	500	0.020	0.026	0.039	0.052	0.080	0.096	0.13	0.16	0.20
		A	Roughing	0.75xD	600	0.022	0.030	0.045	0.060	0.092	0.110	0.15	0.18	0.23
		A/SF	Finishing	0.02xD	1000	0.021	0.029	0.043	0.057	0.088	0.106	0.14	0.18	0.22
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 7% Si	A	Slotting	1xD	230	0.017	0.022	0.033	0.044	0.060	0.072	0.10	0.12	0.15
		A	Roughing	0.75xD	300	0.019	0.025	0.038	0.051	0.069	0.083	0.11	0.14	0.17
		A/SF	Finishing	0.02xD	460	0.018	0.024	0.036	0.048	0.066	0.079	0.11	0.13	0.17
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	A	Slotting	1xD	180	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11	0.14
		A	Roughing	0.75xD	210	0.017	0.023	0.035	0.046	0.063	0.076	0.10	0.13	0.16
		A/SF	Finishing	0.02xD	360	0.017	0.022	0.033	0.044	0.061	0.073	0.10	0.12	0.15
Non-ferr. met. (copper, short-/long-chipp., brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	A	Slotting	1xD	250	0.017	0.022	0.033	0.044	0.060	0.072	0.10	0.12	0.15
		A	Roughing	0.75xD	290	0.019	0.025	0.038	0.051	0.069	0.083	0.11	0.14	0.17
		A/SF	Finishing	0.02xD	500	0.018	0.024	0.036	0.048	0.066	0.079	0.11	0.13	0.17

Milling conditions:

MTC unstable machining conditions
low drive power

long tools

Correction factors:

	a_p Roughing > 1.5xD	v_c -25%	f_z -25%
	medium length tools	v_c -40%	f_z -40%
	extra length tools	v_c -60%	f_z -55%
	uncoated tools	v_c -50%	f_z -25%



Material	Hard-ness	Type	Application	a_e max.	v_c	f_z (mm/tooth) with nom. Ø								
						3	4	6	8	10	12	16	20	25
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	VA/U	Slotting	1xD	135	0.009	0.012	0.018	0.024	0.032	0.038	0.05	0.06	0.08
		VA/U	Roughing	0.75xD	160	0.010	0.014	0.021	0.028	0.037	0.044	0.06	0.07	0.09
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	VA/U	Slotting	1xD	120	0.009	0.012	0.018	0.024	0.032	0.038	0.05	0.06	0.08
		VA/U	Roughing	0.75xD	140	0.010	0.014	0.021	0.028	0.037	0.044	0.06	0.07	0.09
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	U/F	Slotting	1xD	100	0.008	0.011	0.017	0.022	0.030	0.036	0.05	0.06	0.08
		U/F	Roughing	0.75xD	120	0.010	0.013	0.019	0.026	0.035	0.041	0.06	0.07	0.09
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	U/F	Slotting	1xD	55	0.006	0.008	0.012	0.016	0.022	0.026	0.04	0.04	0.06
		U/F	Roughing	0.33xD	80	0.008	0.010	0.016	0.021	0.029	0.034	0.05	0.06	0.07
	55-65 HRC													
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	VA/U	Slotting	1xD	90	0.008	0.011	0.017	0.022	0.030	0.036	0.05	0.06	0.08
		VA/U	Roughing	0.75xD	110	0.010	0.013	0.019	0.026	0.035	0.041	0.06	0.07	0.09
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	VA/U	Slotting	1xD	65	0.008	0.010	0.015	0.020	0.028	0.034	0.04	0.06	0.07
		VA/U	Roughing	0.75xD	80	0.009	0.012	0.017	0.023	0.032	0.039	0.05	0.06	0.08
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	VA/U	Slotting	1xD	55	0.007	0.009	0.013	0.018	0.025	0.030	0.04	0.05	0.06
		VA/U	Roughing	0.60xD	70	0.008	0.011	0.016	0.021	0.030	0.036	0.05	0.06	0.08
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	VA/U	Slotting	1xD	25	0.006	0.008	0.012	0.016	0.022	0.026	0.04	0.04	0.06
		VA/U	Roughing	0.60xD	40	0.007	0.010	0.014	0.019	0.026	0.032	0.04	0.05	0.07
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	VA/U	Slotting	1xD	50	0.007	0.009	0.013	0.018	0.025	0.030	0.04	0.05	0.06
		VA/U	Roughing	0.60xD	70	0.008	0.011	0.016	0.021	0.030	0.036	0.05	0.06	0.08
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	U/F	Slotting	1xD	120	0.009	0.012	0.018	0.024	0.032	0.038	0.05	0.06	0.08
		U/F	Roughing	0.75xD	140	0.010	0.014	0.021	0.028	0.037	0.044	0.06	0.07	0.09
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	U/F	Slotting	1xD	105	0.008	0.011	0.017	0.022	0.030	0.036	0.05	0.06	0.08
		U/F	Roughing	0.75xD	130	0.010	0.013	0.019	0.026	0.035	0.041	0.06	0.07	0.09
Aluminium, Al-wrought alloys, Al-alloys 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 7% Si	A/WF	Slotting	1xD	375	0.011	0.014	0.021	0.028	0.037	0.044	0.06	0.07	0.09
		A/WF	Roughing	0.75xD	440	0.012	0.016	0.024	0.032	0.043	0.051	0.07	0.09	0.11
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 7% Si	A/WF	Slotting	1xD	180	0.010	0.013	0.019	0.026	0.035	0.042	0.06	0.07	0.09
		A/WF	Roughing	0.75xD	210	0.011	0.015	0.022	0.029	0.040	0.048	0.06	0.08	0.10
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	VA/A	Slotting	1xD	140	0.010	0.013	0.019	0.026	0.035	0.042	0.06	0.07	0.09
		VA/A	Roughing	0.75xD	170	0.011	0.015	0.022	0.029	0.040	0.048	0.06	0.08	0.10
Non-ferr. met. (copper, short-/long-chipp., brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	VA/A	Slotting	1xD	200	0.010	0.013	0.019	0.026	0.035	0.042	0.06	0.07	0.09
		VA/A	Roughing	0.75xD	230	0.011	0.015	0.022	0.029	0.040	0.048	0.06	0.08	0.10

Milling conditions:

HPC stable machining conditions high drive power

short tools

long tools

Correction factors:

a_p Roughing > 1.5xD	v_c -25%	f_z -25%
medium length tools	v_c -40%	f_z -40%
extra length tools	v_c -60%	f_z -55%
uncoated tools	v_c -50%	f_z -25%



Material	Hard-ness	Type	Application	a_e max.	v_c	f_z (mm/tooth) with nom. Ø								
						3	4	6	8	10	12	16	20	25
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	GH Z3	Slotting	1xD	120	0.012	0.016	0.024	0.032	0.045	0.054	0.07	0.09	0.11
		GH Z3	Roughing	0.75xD	140	0.014	0.018	0.028	0.037	0.052	0.062	0.08	0.10	0.13
		G-Mold 48 F	Finishing	0.02xD	240	0.013	0.018	0.026	0.035	0.050	0.059	0.08	0.10	0.12
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	GH Z3	Slotting	1xD	105	0.012	0.016	0.024	0.032	0.045	0.054	0.07	0.09	0.11
		GH Z3	Roughing	0.75xD	130	0.014	0.018	0.028	0.037	0.052	0.062	0.08	0.10	0.13
		G-Mold 48 F	Finishing	0.02xD	210	0.013	0.018	0.026	0.035	0.050	0.059	0.08	0.10	0.12
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	GH Z3	Slotting	1xD	90	0.011	0.015	0.023	0.030	0.042	0.050	0.07	0.08	0.11
		GH Z3	Roughing	0.75xD	110	0.013	0.017	0.026	0.035	0.048	0.058	0.08	0.10	0.12
		G-Mold 48 F	Finishing	0.02xD	180	0.013	0.017	0.025	0.033	0.046	0.055	0.07	0.09	0.12
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	G-Mold 65 U	Slotting	1xD	52	0.010	0.013	0.019	0.026	0.035	0.042	0.06	0.07	0.09
		G-Mold 65 F	Roughing	0.03xD	100	0.024	0.032	0.048	0.064	0.088	0.105	0.14	0.18	0.22
			Finishing	0.01xD	110	0.010	0.013	0.019	0.026	0.035	0.042	0.06	0.07	0.09
	55-65 HRC													
		G-Mold 65 F	Roughing	0.03xD	70	0.019	0.025	0.038	0.050	0.070	0.084	0.11	0.14	0.18
			Finishing	0.005xD	80	0.007	0.009	0.014	0.018	0.025	0.030	0.04	0.05	0.06
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	GH Z3	Slotting	1xD	80	0.011	0.015	0.023	0.030	0.042	0.050	0.07	0.08	0.11
		GH Z3	Roughing	0.75xD	100	0.013	0.017	0.026	0.035	0.048	0.058	0.08	0.10	0.12
		G-Mold 48 F	Finishing	0.02xD	160	0.013	0.017	0.025	0.033	0.046	0.055	0.07	0.09	0.12
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	GH Z3	Slotting	1xD	55	0.011	0.014	0.021	0.028	0.038	0.046	0.06	0.08	0.10
		GH Z3	Roughing	0.75xD	70	0.012	0.016	0.024	0.032	0.044	0.052	0.07	0.09	0.11
		G-Mold 48 F	Finishing	0.02xD	110	0.012	0.015	0.023	0.031	0.042	0.050	0.07	0.08	0.10
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	GH Z3	Slotting	1xD	40	0.010	0.013	0.020	0.026	0.035	0.042	0.06	0.07	0.09
		GH Z3	Roughing	0.60xD	50	0.012	0.016	0.024	0.032	0.042	0.050	0.07	0.08	0.11
		G-Mold 48 F	Finishing	0.01xD	80	0.010	0.013	0.020	0.026	0.035	0.042	0.06	0.07	0.09
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	GH Z3	Slotting	1xD	20	0.008	0.010	0.015	0.020	0.030	0.036	0.05	0.06	0.08
		GH Z3	Roughing	0.60xD	30	0.009	0.012	0.018	0.024	0.036	0.043	0.06	0.07	0.09
		G-Mold 48 F	Finishing	0.01xD	40	0.008	0.010	0.015	0.020	0.030	0.036	0.05	0.06	0.08
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	GH Z3	Slotting	1xD	40	0.010	0.013	0.020	0.026	0.038	0.046	0.06	0.08	0.10
		GH Z3	Roughing	0.60xD	50	0.012	0.016	0.024	0.032	0.046	0.055	0.07	0.09	0.11
		G-Mold 48 F	Finishing	0.02xD	80	0.011	0.015	0.022	0.029	0.042	0.050	0.07	0.08	0.10
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	GH Z3	Slotting	1xD	105	0.012	0.016	0.024	0.032	0.045	0.054	0.07	0.09	0.11
		GH Z3	Roughing	0.75xD	130	0.014	0.018	0.028	0.037	0.052	0.062	0.08	0.10	0.13
		G-Mold 48 F	Finishing	0.02xD	210	0.013	0.018	0.026	0.035	0.050	0.059	0.08	0.10	0.12
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	GH Z3	Slotting	1xD	90	0.011	0.015	0.023	0.030	0.042	0.050	0.07	0.08	0.11
		GH Z3	Roughing	0.75xD	110	0.013	0.017	0.026	0.035	0.048	0.058	0.08	0.10	0.12
		G-Mold 48 F	Finishing	0.02xD	180	0.013	0.017	0.025	0.033	0.046	0.055	0.07	0.09	0.12
Aluminium, Al-wrought alloys, Al-alloys 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 5% Si	GH Z3	Slotting	1xD	300	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11	0.14
		GH Z3	Roughing	0.75xD	400	0.017	0.023	0.035	0.046	0.063	0.076	0.10	0.13	0.16
		G-Mold 48 F	Finishing	0.02xD	600	0.017	0.022	0.033	0.044	0.061	0.073	0.10	0.12	0.15
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 5% Si	GH Z3	Slotting	1xD	180	0.014	0.018	0.027	0.036	0.050	0.060	0.08	0.10	0.13
		GH Z3	Roughing	0.75xD	300	0.016	0.021	0.031	0.041	0.058	0.069	0.09	0.12	0.14
		G-Mold 48 F	Finishing	0.02xD	360	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11	0.14
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	GH Z3	Slotting	1xD	150	0.013	0.017	0.025	0.034	0.045	0.054	0.07	0.09	0.11
		GH Z3	Roughing	0.75xD	180	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00
		G-Mold 48 F	Finishing	0.02xD	300	0.014	0.018	0.028	0.037	0.050	0.059	0.08	0.10	0.12
Non-ferr. met. (copper, short-/long-chipp., brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	GH Z3	Slotting	1xD	200	0.014	0.018	0.027	0.036	0.050	0.060	0.08	0.10	0.13
		GH Z3	Roughing	0.75xD	230	0.016	0.021	0.031	0.041	0.058	0.069	0.09	0.12	0.14
		G-Mold 48 F	Finishing	0.02xD	400	0.015	0.020	0.030	0.040	0.055	0.066	0.09	0.11	0.14

Milling conditions:

MTC unstable machining conditions
low drive power

long tools

Correction factors:

ap Roughing > 1.5xD v_c -25% f_z -25%

uncoated tools v_c -50% f_z -25%



Material	Hard-ness	Type	Application	a_e max.	v_c	f_z (mm/tooth) with nom. Ø								
						3	4	6	8	10	12	16	20	25
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	U	Slotting	1xD	120	0.008	0.011	0.017	0.022	0.030	0.036	0.05	0.06	0.08
		U	Roughing	0.75xD	140	0.010	0.013	0.019	0.026	0.035	0.041	0.06	0.07	0.09
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	U	Slotting	1xD	100	0.008	0.011	0.017	0.022	0.030	0.036	0.05	0.06	0.08
		U	Roughing	0.75xD	120	0.010	0.013	0.019	0.026	0.035	0.041	0.06	0.07	0.09
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	H	Slotting	1xD	90	0.008	0.010	0.015	0.020	0.028	0.034	0.04	0.06	0.07
		H	Roughing	0.75xD	110	0.009	0.012	0.017	0.023	0.032	0.039	0.05	0.06	0.08
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	H	Slotting	1xD	50	0.005	0.007	0.011	0.014	0.020	0.024	0.03	0.04	0.05
		H	Roughing	0.33xD	70	0.007	0.009	0.014	0.019	0.026	0.031	0.04	0.05	0.07
	55-65 HRC													
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	U	Slotting	1xD	80	0.008	0.010	0.015	0.020	0.028	0.034	0.04	0.06	0.07
		U	Roughing	0.75xD	100	0.009	0.012	0.017	0.023	0.032	0.039	0.05	0.06	0.08
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	U	Slotting	1xD	55	0.007	0.009	0.013	0.018	0.025	0.030	0.04	0.05	0.06
		U	Roughing	0.75xD	70	0.008	0.010	0.015	0.020	0.029	0.035	0.05	0.06	0.07
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	U	Slotting	1xD	50	0.006	0.008	0.012	0.016	0.022	0.026	0.04	0.04	0.06
		U	Roughing	0.60xD	70	0.007	0.010	0.014	0.019	0.026	0.032	0.04	0.05	0.07
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	U	Slotting	1xD	20	0.005	0.007	0.011	0.014	0.020	0.024	0.03	0.04	0.05
		U	Roughing	0.60xD	30	0.006	0.009	0.013	0.017	0.024	0.029	0.04	0.05	0.06
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	U	Slotting	1xD	45	0.006	0.008	0.012	0.016	0.022	0.026	0.04	0.04	0.06
		U	Roughing	0.60xD	60	0.007	0.010	0.014	0.019	0.026	0.032	0.04	0.05	0.07
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	U	Slotting	1xD	100	0.008	0.011	0.017	0.022	0.030	0.036	0.05	0.06	0.08
		U	Roughing	0.75xD	120	0.010	0.013	0.019	0.026	0.035	0.041	0.06	0.07	0.09
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	H	Slotting	1xD	90	0.008	0.010	0.015	0.020	0.028	0.034	0.04	0.06	0.07
		H	Roughing	0.75xD	110	0.009	0.012	0.017	0.023	0.032	0.039	0.05	0.06	0.08
Aluminium, Al-wrought alloys, Al-alloys 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 7% Si	A	Slotting	1xD	350	0.010	0.013	0.019	0.026	0.035	0.042	0.06	0.07	0.09
		A	Roughing	0.75xD	410	0.011	0.015	0.022	0.029	0.040	0.048	0.06	0.08	0.10
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 7% Si	A	Slotting	1xD	180	0.009	0.012	0.018	0.024	0.032	0.038	0.05	0.06	0.08
		A	Roughing	0.75xD	210	0.010	0.014	0.021	0.028	0.037	0.044	0.06	0.07	0.09
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	A	Slotting	1xD	120	0.009	0.012	0.018	0.024	0.032	0.038	0.05	0.06	0.08
		A	Roughing	0.75xD	140	0.010	0.014	0.021	0.028	0.037	0.044	0.06	0.07	0.09
Non-ferr. met. (copper, short-/long-chipp., brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	A	Slotting	1xD	180	0.009	0.012	0.018	0.024	0.032	0.038	0.05	0.06	0.08
		A	Roughing	0.75xD	210	0.010	0.014	0.021	0.028	0.037	0.044	0.06	0.07	0.09

Milling conditions:

HPC stable machining conditions high drive power

short tools

long tools

Correction factors:

a_p Roughing > 1.5xD — v_c -25% — fz -25%

extra length tools — v_c -60% — fz -55%

uncoated tools — v_c -50% — fz -25%



Material	Hard-ness	Type	Application	a_e max.	v_c	f_z (mm/tooth) with nom. Ø								
						3	4	6	8	10	12	16	20	25
Struct./free-cutting steels, unall. heat-treat/case hard. steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	≤ 850 N/mm²	Z2/Z3	Slotting	1xD	120	0.012	0.016	0.024	0.032	0.042	0.050	0.07	0.08	0.11
		Z3/Z4	Roughing	0.75xD	140	0.014	0.018	0.028	0.037	0.048	0.058	0.08	0.10	0.12
		Z4	Finishing	0.02xD	240	0.013	0.018	0.026	0.035	0.046	0.055	0.07	0.09	0.12
Free-cutting steels, unall. case hard. steels, nitr. steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm²	Z2/Z3	Slotting	1xD	110	0.012	0.016	0.024	0.032	0.042	0.050	0.07	0.08	0.11
		Z3/Z4	Roughing	0.75xD	130	0.014	0.018	0.028	0.037	0.048	0.058	0.08	0.10	0.12
		Z4	Finishing	0.02xD	220	0.013	0.018	0.026	0.035	0.046	0.055	0.07	0.09	0.12
Alloyed heat-treatable. tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm²	Z2/Z3	Slotting	1xD	90	0.011	0.014	0.021	0.028	0.039	0.047	0.06	0.08	0.10
		Z3/Z4	Roughing	0.75xD	110	0.012	0.016	0.024	0.032	0.045	0.054	0.07	0.09	0.11
		Z4	Finishing	0.02xD	180	0.012	0.015	0.023	0.031	0.043	0.051	0.07	0.09	0.11
Hardened steel Tool steel. heat-treatable steel. spring steel. high-speed steel. case hardened steel. etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2	≤ 55 HRC	Z2/Z3	Slotting	1xD	35	0.007	0.009	0.013	0.018	0.024	0.029	0.04	0.05	0.06
		Z3/Z4	Roughing	0.33xD	50	0.009	0.011	0.017	0.023	0.031	0.037	0.05	0.06	0.08
		Z4	Finishing	0.01xD	70	0.007	0.009	0.013	0.018	0.024	0.029	0.04	0.05	0.06
	55-65 HRC													
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	≤ 750 N/mm²	Z2/Z3	Slotting	1xD	80	0.008	0.011	0.017	0.022	0.030	0.036	0.05	0.06	0.08
		Z3/Z4	Roughing	0.75xD	100	0.010	0.013	0.019	0.026	0.035	0.041	0.06	0.07	0.09
		Z4	Finishing	0.02xD	160	0.009	0.012	0.018	0.025	0.033	0.040	0.05	0.07	0.08
Stainless steel 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm²	Z2/Z3	Slotting	1xD	55	0.007	0.010	0.014	0.019	0.027	0.032	0.04	0.05	0.07
		Z3/Z4	Roughing	0.75xD	70	0.008	0.011	0.017	0.022	0.031	0.037	0.05	0.06	0.08
		Z4	Finishing	0.02xD	110	0.008	0.011	0.016	0.021	0.030	0.036	0.05	0.06	0.07
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	≥ 850 N/mm²	Z2/Z3	Slotting	1xD	50	0.006	0.008	0.013	0.017	0.024	0.029	0.04	0.05	0.06
		Z3/Z4	Roughing	0.60xD	70	0.008	0.010	0.015	0.020	0.029	0.035	0.05	0.06	0.07
		Z4	Finishing	0.01xD	100	0.006	0.008	0.013	0.017	0.024	0.029	0.04	0.05	0.06
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	≤ 1,300 N/mm²	Z2/Z3	Slotting	1xD	25	0.005	0.006	0.009	0.012	0.018	0.022	0.03	0.04	0.05
		Z3/Z4	Roughing	0.60xD	40	0.005	0.007	0.011	0.014	0.022	0.026	0.03	0.04	0.05
		Z4	Finishing	0.01xD	50	0.005	0.006	0.009	0.012	0.018	0.022	0.03	0.04	0.05
Titanium alloys ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤ 1,300 N/mm²	Z2/Z3	Slotting	1xD	40	0.008	0.011	0.017	0.022	0.030	0.036	0.05	0.06	0.08
		Z3/Z4	Roughing	0.60xD	50	0.010	0.013	0.020	0.027	0.036	0.043	0.06	0.07	0.09
		Z4	Finishing	0.02xD	80	0.009	0.012	0.018	0.025	0.033	0.040	0.05	0.07	0.08
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	≤ 240 HB	Z2/Z3	Slotting	1xD	110	0.011	0.015	0.022	0.030	0.039	0.047	0.06	0.08	0.10
		Z3/Z4	Roughing	0.75xD	130	0.013	0.017	0.026	0.034	0.045	0.054	0.07	0.09	0.11
		Z4	Finishing	0.02xD	220	0.012	0.016	0.024	0.033	0.043	0.051	0.07	0.09	0.11
Cast/grey cast iron, spher.graphite/mall, cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	≥ 240 HB	Z2/Z3	Slotting	1xD	95	0.009	0.012	0.019	0.025	0.033	0.040	0.05	0.07	0.08
		Z3/Z4	Roughing	0.75xD	110	0.011	0.014	0.021	0.029	0.038	0.046	0.06	0.08	0.09
		Z4	Finishing	0.02xD	190	0.010	0.014	0.020	0.027	0.036	0.044	0.06	0.07	0.09
Aluminium, Al-wrought alloys, Al-alloys 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤ 7% Si	Z2/Z3	Slotting	1xD	300	0.019	0.025	0.037	0.050	0.065	0.078	0.10	0.13	0.16
		Z2/Z3	Roughing	0.75xD	350	0.021	0.029	0.043	0.057	0.075	0.090	0.12	0.15	0.19
		Z3/Z4	Finishing	0.02xD	600	0.020	0.027	0.041	0.055	0.072	0.086	0.11	0.14	0.18
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≥ 7% Si	Z2/Z3	Slotting	1xD	160	0.016	0.021	0.031	0.042	0.056	0.067	0.09	0.11	0.14
		Z2/Z3	Roughing	0.75xD	190	0.018	0.024	0.036	0.048	0.064	0.077	0.10	0.13	0.16
		Z3/Z4	Finishing	0.02xD	320	0.017	0.023	0.034	0.046	0.062	0.074	0.10	0.12	0.15
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	Z2/Z3	Slotting	1xD	125	0.016	0.021	0.031	0.042	0.056	0.067	0.09	0.11	0.14
		Z2/Z3	Roughing	0.75xD	210	0.018	0.024	0.036	0.048	0.064	0.077	0.10	0.13	0.16
		Z3/Z4	Finishing	0.02xD	360	0.017	0.023	0.034	0.046	0.062	0.074	0.10	0.12	0.15
Non-ferr. met. (copper, short-/long-chipp., brass/bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ... 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤ 850 N/mm²	Z2/Z3	Slotting	1xD	175	0.013	0.017	0.025	0.034	0.046	0.055	0.07	0.09	0.12
		Z2/Z3	Roughing	0.75xD	290	0.014	0.019	0.029	0.039	0.053	0.063	0.08	0.11	0.13
		Z3/Z4	Finishing	0.02xD	500	0.014	0.018	0.028	0.037	0.051	0.061	0.08	0.10	0.13

OPEN SLOTS AND HELIX

Art. no. 6808

	Material/ISO material	a_e max.	a_p max.	v_c	f_z/Ø			v_c	f_z/Ø		v_c	f_z/Ø			v_c	f_z/Ø	
					0.8	1.0	1.2		1.5	1.8		2.0	2.2	2.5		2.8	3.0
P	Unalloyed steel	1.00xD	1.00xD	140	0.0072	0.0090	0.0108	168	0.0135	0.0162	182	0.0180	0.0198	0.0225	196	0.0252	0.0270
P	Low-alloyed steel	1.00xD	1.00xD	140	0.0064	0.0080	0.0096	168	0.0120	0.0144	182	0.0160	0.0176	0.0200	196	0.0224	0.0240
P	High-alloyed steel and tool steel	1.00xD	0.75xD	140	0.0048	0.0060	0.0072	168	0.0090	0.0108	182	0.0120	0.0132	0.0150	196	0.0168	0.0180
M	Stainless steel, ferritic, martensitic	1.00xD	1.00xD	140	0.0064	0.0080	0.0096	168	0.0120	0.0144	182	0.0160	0.0176	0.0200	196	0.0224	0.0240
M	Stainless steel, austenitic	1.00xD	1.00xD	120	0.0056	0.0070	0.0084	144	0.0105	0.0126	156	0.0140	0.0154	0.0175	168	0.0196	0.0210
M	Duplex steel, high strength stainless steels	1.00xD	0.75xD	90	0.0049	0.0061	0.0073	108	0.0092	0.0110	117	0.0122	0.0135	0.0153	126	0.0171	0.0184
K	Grey cast iron Cast iron with spheroidal graphite iron	1.00xD	1.00xD	120	0.0056	0.0070	0.0084	144	0.0105	0.0126	156	0.0140	0.0154	0.0175	168	0.0196	0.0210
K	Malleable cast iron GJV & ADI	1.00xD	1.00xD	100	0.0050	0.0062	0.0075	120	0.0093	0.0112	130	0.0124	0.0137	0.0156	140	0.0174	0.0187
N	Aluminium-wrought alloys Aluminium-cast alloys	1.00xD	1.00xD	170	0.0096	0.0120	0.0144	204	0.0180	0.0216	221	0.0240	0.0264	0.0300	238	0.0336	0.0360
N	Copper and copper alloys	1.00xD	1.00xD	125	0.0088	0.0110	0.0133	150	0.0166	0.0199	162.5	0.0221	0.0243	0.0276	175	0.0309	0.0331
S	Heat-resistant alloys, Fe-based	1.00xD	0.50xD	100	0.0036	0.0045	0.0054	120	0.0068	0.0081	130	0.0090	0.0099	0.0113	140	0.0126	0.0135
S	Heat-resistant alloys, Ni-based, CO-based	1.00xD	0.50xD	60	0.0029	0.0037	0.0044	72	0.0055	0.0066	78	0.0073	0.0080	0.0091	84	0.0102	0.0110
S	Titanium alloys & pure titanium	1.00xD	0.75xD	100	0.0060	0.0075	0.0090	120	0.0113	0.0135	130	0.0150	0.0165	0.0188	140	0.0210	0.0225
H	Hardened steel, hardened and tempered, < 55 HRC	1.00xD	0.25xD	35	0.0032	0.0040	0.0048	42	0.0060	0.0072	46	0.0080	0.0088	0.0100	49	0.0112	0.0120

RAMPING AND CLOSED SLOTS

Art. no. 6808

	Material/ISO material	a_e max.	a_p max	v_c	f_z/Ø			v_c	f_z/Ø		v_c	f_z/Ø			v_c	f_z/Ø	
					0.8	1.0	1.2		1.5	1.8		2.0	2.2	2.5		2.8	3.0
P	Unalloyed steel	1.00xD	1.00xD	100	0.0043	0.0054	0.0065	120	0.0081	0.0097	130	0.0108	0.0119	0.0135	140	0.0151	0.0162
P	Low-alloyed steel	1.00xD	1.00xD	100	0.0038	0.0048	0.0058	120	0.0072	0.0086	130	0.0096	0.0106	0.0120	140	0.0134	0.0144
P	High-alloyed steel and tool steel	1.00xD	0.75xD	100	0.0029	0.0036	0.0043	120	0.0054	0.0065	130	0.0072	0.0079	0.0090	140	0.0101	0.0108
M	Stainless steel, ferritic, martensitic	1.00xD	1.00xD	100	0.0038	0.0048	0.0058	120	0.0072	0.0086	130	0.0096	0.0106	0.0120	140	0.0134	0.0144
M	Stainless steel, austenitic	1.00xD	1.00xD	90	0.0034	0.0042	0.0050	108	0.0063	0.0076	117	0.0084	0.0092	0.0105	126	0.0118	0.0126
M	Duplex steel, high strength stainless steels	1.00xD	0.75xD	65	0.0029	0.0037	0.0044	78	0.0055	0.0066	85	0.0073	0.0081	0.0092	91	0.0103	0.0110
K	Grey cast iron Cast iron with spheroidal graphite iron	1.00xD	1.00xD	90	0.0034	0.0042	0.0050	108	0.0063	0.0076	117	0.0084	0.0092	0.0105	126	0.0118	0.0126
K	Malleable cast iron GJV & ADI	1.00xD	1.00xD	75	0.0030	0.0037	0.0045	90	0.0056	0.0067	98	0.0075	0.0082	0.0093	105	0.0105	0.0112
N	Aluminium-wrought alloys Aluminium-cast alloys	1.00xD	1.00xD	120	0.0058	0.0072	0.0086	144	0.0108	0.0130	156	0.0144	0.0158	0.0180	168	0.0202	0.0216
N	Copper and copper alloys	1.00xD	1.00xD	90	0.0053	0.0066	0.0080	108	0.0099	0.0119	117	0.0133	0.0146	0.0166	126	0.0186	0.0199
S	Heat-resistant alloys, Fe-based	1.00xD	0.50xD	75	0.0022	0.0027	0.0032	90	0.0041	0.0049	98	0.0054	0.0059	0.0068	105	0.0076	0.0081
S	Heat-resistant alloys, Ni-based, CO-based	1.00xD	0.50xD	45	0.0018	0.0022	0.0026	54	0.0033	0.0039	59	0.0044	0.0048	0.0055	63	0.0061	0.0066
S	Titanium alloys & pure titanium	1.00xD	0.75xD	70	0.0036	0.0045	0.0054	84	0.0068	0.0081	91	0.0090	0.0099	0.0113	98	0.0126	0.0135
H	Hardened steel, hardened and tempered, < 55 HRC	1.00xD	0.25xD	25	0.0019	0.0024	0.0029	30	0.0036	0.0043	33	0.0048	0.0053	0.0060	35	0.0067	0.0072

ROUGHING

Art. no. 6808

	Material/ISO material	a_e max.	a_p max	v_c	f_z/Ø			v_c	f_z/Ø		v_c	f_z/Ø			v_c	f_z/Ø	
					0.8	1.0	1.2		1.5	1.8		2.0	2.2	2.5		2.8	3.0
P	Unalloyed steel	0.25xD	2.00xD	170	0.0113	0.0142	0.0170	204	0.0213	0.0255	221	0.0284	0.0312	0.0354	238	0.0397	0.0425
P	Low-alloyed steel	0.25xD	2.00xD	170	0.0101	0.0126	0.0151	204	0.0189	0.0227	221	0.0252	0.0277	0.0315	238	0.0353	0.0378
P	High-alloyed steel and tool steel	0.20xD	2.00xD	170	0.0076	0.0095	0.0113	204	0.0142	0.0170	221	0.0189	0.0208	0.0236	238	0.0265	0.0284
M	Stainless steel, ferritic, martensitic	0.25xD	2.00xD	170	0.0101	0.0126	0.0151	204	0.0189	0.0227	221	0.0252	0.0277	0.0315	238	0.0353	0.0378
M	Stainless steel, austenitic	0.20xD	2.00xD	145	0.0088	0.0110	0.0132	174	0.0165	0.0198	189	0.0221	0.0243	0.0276	203	0.0309	0.0331
M	Duplex steel, high strength stainless steels	0.20xD	2.00xD	105	0.0077	0.0096	0.0116	126	0.0145	0.0174	137	0.0193	0.0212	0.0241	147	0.0270	0.0289
K	Grey cast iron Cast iron with spheroidal graphite iron	0.25xD	2.00xD	145	0.0088	0.0110	0.0132	174	0.0165	0.0198	189	0.0221	0.0243	0.0276	203	0.0309	0.0331
K	Malleable cast iron GJV & ADI	0.25xD	2.00xD	120	0.0078	0.0098	0.0118	144	0.0147	0.0176	156	0.0196	0.0216	0.0245	168	0.0274	0.0294
N	Aluminium-wrought alloys Aluminium-cast alloys	0.25xD	2.00xD	200	0.0151	0.0189	0.0227	240	0.0284	0.0340	260	0.0378	0.0416	0.0473	280	0.0529	0.0567
N	Copper and copper alloys	0.25xD	2.00xD	150	0.0139	0.0174	0.0209	180	0.0261	0.0313	195	0.0348	0.0383	0.0435	210	0.0487	0.0522
S	Heat-resistant alloys, Fe-based	0.15xD	2.00xD	120	0.0057	0.0071	0.0085	144	0.0106	0.0128	156	0.0142	0.0156	0.0177	168	0.0198	0.0213
S	Heat-resistant alloys, Ni-based, CO-based	0.15xD	2.00xD	70	0.0046	0.0058	0.0069	84	0.0086	0.0104	91	0.0115	0.0127	0.0144	98	0.0161	0.0173
S	Titanium alloys & pure titanium	0.20xD	2.00xD	115	0.0095	0.0118	0.0142	138	0.0177	0.0213	150	0.0236	0.0260	0.0295	161	0.0331	0.0354
H	Hardened steel, hardened and tempered, < 55 HRC	0.05xD	2.00xD	45	0.0050	0.0063	0.0076	54	0.0095	0.0113	59	0.0126	0.0139	0.0158	63	0.0176	0.0189

FINISHING

Art. no. 6808

	Material/ISO material	a_e max.	a_p max.	v_c	f_z/Ø			v_c	f_z/Ø		v_c	f_z/Ø			v_c	f_z/Ø	
					0.8	1.0	1.2		1.5	1.8		2.0	2.2	2.5		2.8	3.0
P	Unalloyed steel	0.03xD	2.00xD	**180**	0.0086	0.0108	0.0130	**216**	0.0162	0.0194	**234**	0.0216	0.0238	0.0270	**252**	0.0302	0.0324
P	Low-alloyed steel	0.03xD	2.00xD	**180**	0.0077	0.0096	0.0115	**216**	0.0144	0.0173	**234**	0.0192	0.0211	0.0240	**252**	0.0269	0.0288
P	High-alloyed steel and tool steel	0.03xD	2.00xD	**180**	0.0058	0.0072	0.0086	**216**	0.0108	0.0130	**234**	0.0144	0.0158	0.0180	**252**	0.0202	0.0216
M	Stainless steel, ferritic, martensitic	0.03xD	2.00xD	**180**	0.0077	0.0096	0.0115	**216**	0.0144	0.0173	**234**	0.0192	0.0211	0.0240	**252**	0.0269	0.0288
M	Stainless steel, austenitic	0.03xD	2.00xD	**155**	0.0067	0.0084	0.0101	**186**	0.0126	0.0151	**202**	0.0168	0.0185	0.0210	**217**	0.0235	0.0252
M	Duplex steel, high strength stainless steels	0.03xD	2.00xD	**115**	0.0059	0.0073	0.0088	**138**	0.0110	0.0132	**150**	0.0147	0.0162	0.0184	**161**	0.0206	0.0220
K	Grey cast iron Cast iron with spheroidal graphite iron	0.03xD	2.00xD	**155**	0.0067	0.0084	0.0101	**186**	0.0126	0.0151	**202**	0.0168	0.0185	0.0210	**217**	0.0235	0.0252
K	Malleable cast iron GJV & ADI	0.03xD	2.00xD	**130**	0.0060	0.0075	0.0090	**156**	0.0112	0.0134	**169**	0.0149	0.0164	0.0187	**182**	0.0209	0.0224
N	Aluminium-wrought alloys Aluminium-cast alloys	0.03xD	2.00xD	**220**	0.0115	0.0144	0.0173	**264**	0.0216	0.0259	**286**	0.0288	0.0317	0.0360	**308**	0.0403	0.0432
N	Copper and copper alloys	0.03xD	2.00xD	**160**	0.0106	0.0133	0.0159	**192**	0.0199	0.0239	**208**	0.0265	0.0292	0.0331	**224**	0.0371	0.0398
S	Heat-resistant alloys, Fe-based	0.03xD	2.00xD	**130**	0.0043	0.0054	0.0065	**156**	0.0081	0.0097	**169**	0.0108	0.0119	0.0135	**182**	0.0151	0.0162
S	Heat-resistant alloys, Ni-based, CO-based	0.03xD	2.00xD	**75**	0.0035	0.0044	0.0053	**90**	0.0066	0.0079	**98**	0.0088	0.0096	0.0110	**105**	0.0123	0.0132
S	Titanium alloys & pure titanium	0.03xD	2.00xD	**120**	0.0072	0.0090	0.0108	**144**	0.0135	0.0162	**156**	0.0180	0.0198	0.0225	**168**	0.0252	0.0270
H	Hardened steel, hardened and tempered, < 55 HRC	0.02xD	2.00xD	**45**	0.0038	0.0048	0.0058	**54**	0.0072	0.0086	**59**	0.0096	0.0106	0.0120	**63**	0.0134	0.0144

DRILLING

Art. no. 6808

	Material/ISO material	a_p max.	v_c	f_z/Ø			v_c	f_z/Ø		v_c	f_z/Ø			v_c	f_z/Ø	
				0.8	1.0	1.2		1.5	1.8		2.0	2.2	2.5		2.8	3.0
P	Unalloyed steel	1.00xD	**100**	0.0014	0.0018	0.0022	**120**	0.0027	0.0032	**130**	0.0036	0.0040	0.0045	**140**	0.0050	0.0054
P	Low-alloyed steel	1.00xD	**100**	0.0013	0.0016	0.0019	**120**	0.0024	0.0029	**130**	0.0032	0.0035	0.0040	**140**	0.0045	0.0048
P	High-alloyed steel and tool steel	0.50xD	**90**	0.0010	0.0012	0.0014	**108**	0.0018	0.0022	**117**	0.0024	0.0026	0.0030	**126**	0.0034	0.0036
M	Stainless steel, ferritic, martensitic	0.75xD	**90**	0.0012	0.0015	0.0018	**108**	0.0023	0.0027	**117**	0.0030	0.0033	0.0038	**126**	0.0042	0.0045
M	Stainless steel, austenitic	0.50xD	**85**	0.0011	0.0014	0.0017	**102**	0.0021	0.0025	**111**	0.0028	0.0031	0.0035	**119**	0.0039	0.0042
M	Duplex steel, high strength stainless steels	0.25xD	**65**	0.0010	0.0012	0.0014	**78**	0.0018	0.0022	**85**	0.0024	0.0026	0.0030	**91**	0.0034	0.0036
K	Grey cast iron Cast iron with spheroidal graphite iron	1.00xD	**90**	0.0011	0.0014	0.0017	**108**	0.0021	0.0025	**117**	0.0028	0.0031	0.0035	**126**	0.0039	0.0042
K	Malleable cast iron GJV & ADI	1.00xD	**75**	0.0010	0.0012	0.0014	**90**	0.0018	0.0022	**98**	0.0024	0.0026	0.0030	**105**	0.0034	0.0036
N	Aluminium-wrought alloys Aluminium-cast alloys	0.50xD	**125**	0.0019	0.0024	0.0029	**150**	0.0036	0.0043	**163**	0.0048	0.0053	0.0060	**175**	0.0067	0.0072
N	Copper and copper alloys	0.50xD	**90**	0.0018	0.0022	0.0026	**108**	0.0033	0.0040	**117**	0.0044	0.0048	0.0055	**126**	0.0062	0.0066
S	Heat-resistant alloys, Fe-based	0.25xD	**75**	0.0007	0.0009	0.0011	**90**	0.0014	0.0016	**98**	0.0018	0.0020	0.0023	**105**	0.0025	0.0027
S	Heat-resistant alloys, Ni-based, CO-based	0.25xD	**45**	0.0006	0.0008	0.0009	**54**	0.0011	0.0014	**59**	0.0015	0.0017	0.0019	**63**	0.0021	0.0023
S	Titanium alloys & pure titanium	0.25xD	**70**	0.0012	0.0015	0.0018	**84**	0.0023	0.0027	**91**	0.0030	0.0033	0.0038	**98**	0.0042	0.0045

OPEN SLOTS AND HELIX

Art. no. 6809

	Material/ISO material	a_e max.	a_p max.	v_c	f_z/Ø		v_c	f_z/Ø	v_c	f_z/Ø		v_c	f_z/Ø	
					1.0	1.2		1.5		2.0	2.5		2.8	3.0
P	Unalloyed steel	1.00xD	0.50xD	112	0.0081	0.0097	134	0.0122	146	0.0162	0.0203	157	0.0227	0.0243
P	Low-alloyed steel	1.00xD	0.50xD	112	0.0072	0.0086	134	0.0108	146	0.0144	0.0180	157	0.0202	0.0216
P	High-alloyed steel and tool steel	1.00xD	0.25xD	112	0.0054	0.0065	134	0.0081	146	0.0108	0.0135	157	0.0151	0.0162
M	Stainless steel, ferritic, martensitic	1.00xD	0.25xD	112	0.0072	0.0086	134	0.0108	146	0.0144	0.0180	157	0.0202	0.0216
M	Stainless steel, austenitic	1.00xD	0.25xD	96	0.0063	0.0076	115	0.0095	125	0.0126	0.0158	134	0.0176	0.0189
M	Duplex steel, high strength stainless steels	1.00xD	0.25xD	71	0.0055	0.0066	85	0.0083	92	0.0110	0.0138	99	0.0154	0.0165
K	Grey cast iron Cast iron with spheroidal graphite iron	1.00xD	0.50xD	96	0.0063	0.0076	115	0.0095	125	0.0126	0.0158	134	0.0176	0.0189
K	Malleable cast iron GJV & ADI	1.00xD	0.50xD	80	0.0056	0.0067	96	0.0084	104	0.0112	0.0140	112	0.0157	0.0168
N	Aluminium-wrought alloys Aluminium-cast alloys	1.00xD	0.50xD	136	0.0108	0.0130	163	0.0162	177	0.0216	0.0270	190	0.0302	0.0324
N	Copper and copper alloys	1.00xD	0.50xD	100	0.0099	0.0119	120	0.0149	130	0.0199	0.0249	140	0.0278	0.0298
S	Heat-resistant alloys, Fe-based	1.00xD	0.25xD	80	0.0041	0.0049	96	0.0061	104	0.0081	0.0101	112	0.0113	0.0122
S	Heat-resistant alloys, Ni-based, CO-based	1.00xD	0.25xD	46	0.0033	0.0039	55	0.0049	60	0.0066	0.0082	64	0.0092	0.0099
S	Titanium alloys & pure titanium	1.00xD	0.25xD	72	0.0068	0.0081	86	0.0101	94	0.0135	0.0169	101	0.0189	0.0203
H	Hardened steel, hardened and tempered, < 55 HRC	1.00xD	0.10xD	26	0.0036	0.0043	31	0.0054	34	0.0072	0.0090	36	0.0101	0.0108

RAMPING AND CLOSED SLOTS

Art. no. 6809

	Material/ISO material	a_e max.	a_p max.	v_c	f_z/Ø		v_c	f_z/Ø	v_c	f_z/Ø		v_c	f_z/Ø	
					1.0	1.2		1.5		2.0	2.5		2.8	3.0
P	Unalloyed steel	1.00xD	0.50xD	78	0.0049	0.0058	94	0.0073	102	0.0097	0.0122	110	0.0136	0.0146
P	Low-alloyed steel	1.00xD	0.50xD	78	0.0043	0.0052	94	0.0065	102	0.0086	0.0108	110	0.0121	0.0130
P	High-alloyed steel and tool steel	1.00xD	0.25xD	78	0.0032	0.0039	94	0.0049	102	0.0065	0.0081	110	0.0091	0.0097
M	Stainless steel. ferritic. martensitic	1.00xD	0.25xD	78	0.0043	0.0052	94	0.0065	102	0.0086	0.0108	110	0.0121	0.0130
M	Stainless steel. austenitic	1.00xD	0.25xD	67	0.0038	0.0045	81	0.0057	87	0.0076	0.0095	94	0.0106	0.0113
M	Duplex steel. high strength stainless steels	1.00xD	0.25xD	50	0.0033	0.0040	60	0.0050	65	0.0066	0.0083	70	0.0093	0.0099
K	Grey cast iron Cast iron with spheroidal graphite iron	1.00xD	0.50xD	67	0.0038	0.0045	81	0.0057	87	0.0076	0.0095	94	0.0106	0.0113
K	Malleable cast iron GJV & ADI	1.00xD	0.50xD	56	0.0034	0.0040	67	0.0050	73	0.0067	0.0084	78	0.0094	0.0101
N	Aluminium-wrought alloys Aluminium-cast alloys	1.00xD	0.50xD	95	0.0065	0.0078	114	0.0097	124	0.0130	0.0162	133	0.0181	0.0194
N	Copper and copper alloys	1.00xD	0.50xD	70	0.0060	0.0072	84	0.0089	91	0.0119	0.0149	98	0.0167	0.0179
S	Heat-resistant alloys. Fe-based	1.00xD	0.25xD	56	0.0024	0.0029	67	0.0036	73	0.0049	0.0061	78	0.0068	0.0073
S	Heat-resistant alloys. Ni-based. CO-based	1.00xD	0.25xD	32	0.0020	0.0024	39	0.0030	42	0.0039	0.0049	45	0.0055	0.0059
S	Titanium alloys & pure titanium	1.00xD	0.25xD	50	0.0041	0.0049	60	0.0061	66	0.0081	0.0101	71	0.0113	0.0122
H	Hardened steel. hardened and tempered. < 55 HRC	1.00xD	0.10xD	18	0.0022	0.0026	22	0.0032	24	0.0043	0.0054	25	0.0060	0.0065

ROUGHING

Art. no. 6809

	Material/ISO material	a_e max.	a_p max.	v_c	f_z/Ø		v_c	f_z/Ø	v_c	f_z/Ø		v_c	f_z/Ø	
					1.0	1.2		1.5		2.0	2.5		2.8	3.0
P	Unalloyed steel	0.10xD	5.00xD	134	0.0128	0.0153	161	0.0191	174	0.0255	0.0319	188	0.0357	0.0383
P	Low-alloyed steel	0.10xD	5.00xD	134	0.0113	0.0136	161	0.0170	174	0.0227	0.0284	188	0.0318	0.0340
P	High-alloyed steel and tool steel	0.08xD	5.00xD	134	0.0085	0.0102	161	0.0128	174	0.0170	0.0213	188	0.0238	0.0255
M	Stainless steel. ferritic. martensitic	0.10xD	5.00xD	134	0.0113	0.0136	161	0.0170	174	0.0227	0.0284	188	0.0318	0.0340
M	Stainless steel. austenitic	0.08xD	5.00xD	115	0.0099	0.0119	138	0.0149	150	0.0198	0.0248	161	0.0278	0.0298
M	Duplex steel. high strength stainless steels	0.05xD	5.00xD	86	0.0087	0.0104	103	0.0130	112	0.0174	0.0217	120	0.0243	0.0260
K	Grey cast iron Cast iron with spheroidal graphite iron	0.10xD	5.00xD	115	0.0099	0.0119	138	0.0149	150	0.0198	0.0248	161	0.0278	0.0298
K	Malleable cast iron GJV & ADI	0.10xD	5.00xD	96	0.0088	0.0106	115	0.0132	125	0.0176	0.0220	134	0.0247	0.0265
N	Aluminium-wrought alloys Aluminium-cast alloys	0.15xD	5.00xD	163	0.0170	0.0204	196	0.0255	212	0.0340	0.0425	228	0.0476	0.0510
N	Copper and copper alloys	0.12xD	5.00xD	120	0.0157	0.0188	144	0.0235	156	0.0313	0.0392	168	0.0438	0.0470
S	Heat-resistant alloys. Fe-based	0.08xD	5.00xD	96	0.0064	0.0077	115	0.0096	125	0.0128	0.0159	134	0.0179	0.0191
S	Heat-resistant alloys. Ni-based. CO-based	0.05xD	5.00xD	55	0.0052	0.0062	66	0.0078	72	0.0104	0.0130	77	0.0145	0.0155
S	Titanium alloys & pure titanium	0.08xD	5.00xD	86	0.0106	0.0128	103	0.0159	112	0.0213	0.0266	120	0.0298	0.0319
H	Hardened steel. hardened and tempered. < 55 HRC	0.03xD	5.00xD	31	0.0057	0.0068	37	0.0085	40	0.0113	0.0142	43	0.0159	0.0170

FINISHING

Art. no. 6809

	Material/ISO material	a_e max.	a_p max.	v_c	f_z/Ø		v_c	f_z/Ø	v_c	f_z/Ø		v_c	f_z/Ø	
					1.0	1.2		1.5		2.0	2.5		2.8	3.0
P	Unalloyed steel	0.02xD	5.00xD	**146**	0.0097	0.0117	**175**	0.0146	**190**	0.0194	0.0243	**204**	0.0272	0.0292
P	Low-alloyed steel	0.02xD	5.00xD	**146**	0.0086	0.0104	**175**	0.0130	**190**	0.0173	0.0216	**204**	0.0242	0.0259
P	High-alloyed steel and tool steel	0.02xD	5.00xD	**146**	0.0065	0.0078	**175**	0.0097	**190**	0.0130	0.0162	**204**	0.0181	0.0194
M	Stainless steel. ferritic. martensitic	0.02xD	5.00xD	**146**	0.0086	0.0104	**175**	0.0130	**190**	0.0173	0.0216	**204**	0.0242	0.0259
M	Stainless steel. austenitic	0.02xD	5.00xD	**125**	0.0076	0.0091	**150**	0.0113	**163**	0.0151	0.0189	**175**	0.0212	0.0227
M	Duplex steel. high strength stainless steels	0.02xD	5.00xD	**93**	0.0066	0.0079	**112**	0.0099	**121**	0.0132	0.0165	**130**	0.0185	0.0198
K	Grey cast iron Cast iron with spheroidal graphite iron	0.02xD	5.00xD	**125**	0.0076	0.0091	**150**	0.0113	**163**	0.0151	0.0189	**175**	0.0212	0.0227
K	Malleable cast iron GJV & ADI	0.02xD	5.00xD	**104**	0.0067	0.0081	**125**	0.0101	**135**	0.0134	0.0168	**146**	0.0188	0.0202
N	Aluminium-wrought alloys Aluminium-cast alloys	0.02xD	5.00xD	**177**	0.0130	0.0156	**212**	0.0194	**230**	0.0259	0.0324	**248**	0.0363	0.0389
N	Copper and copper alloys	0.02xD	5.00xD	**130**	0.0119	0.0143	**156**	0.0179	**169**	0.0239	0.0298	**182**	0.0334	0.0358
S	Heat-resistant alloys. Fe-based	0.02xD	5.00xD	**104**	0.0049	0.0058	**125**	0.0073	**135**	0.0097	0.0122	**146**	0.0136	0.0146
S	Heat-resistant alloys. Ni-based. CO-based	0.02xD	5.00xD	**60**	0.0039	0.0047	**72**	0.0059	**78**	0.0079	0.0099	**84**	0.0111	0.0118
S	Titanium alloys & pure titanium	0.02xD	5.00xD	**94**	0.0081	0.0097	**113**	0.0122	**122**	0.0162	0.0203	**132**	0.0227	0.0243
H	Hardened steel. hardened and tempered. < 55 HRC	0.01xD	5.00xD	**34**	0.0043	0.0052	**41**	0.0065	**44**	0.0086	0.0108	**48**	0.0121	0.0130

DRILLING

Art. no. 6809

	Material/ISO material	a_p max.	v_c	f_z/Ø		v_c	f_z/Ø	v_c	f_z/Ø		v_c	f_z/Ø	
				1.0	1.2		1.5		2.0	2.5		2.8	3.0
P	Unalloyed steel	0.50xD	**84**	0.0014	0.0017	**101**	0.0022	**109**	0.0029	0.0036	**118**	0.0040	0.0043
P	Low-alloyed steel	0.50xD	**84**	0.0013	0.0015	**101**	0.0019	**109**	0.0026	0.0032	**118**	0.0036	0.0038
P	High-alloyed steel and tool steel	0.25xD	**84**	0.0010	0.0012	**101**	0.0014	**109**	0.0019	0.0024	**118**	0.0027	0.0029
M	Stainless steel. ferritic. martensitic	0.25xD	**84**	0.0013	0.0015	**101**	0.0019	**109**	0.0026	0.0032	**118**	0.0036	0.0038
M	Stainless steel. austenitic	0.25xD	**72**	0.0011	0.0013	**86**	0.0017	**94**	0.0022	0.0028	**101**	0.0031	0.0034
M	Duplex steel. high strength stainless steels	0.25xD	**54**	0.0010	0.0012	**65**	0.0015	**70**	0.0020	0.0024	**76**	0.0027	0.0029
K	Grey cast iron Cast iron with spheroidal graphite iron	0.50xD	**72**	0.0011	0.0013	**86**	0.0017	**94**	0.0022	0.0028	**101**	0.0031	0.0034
K	Malleable cast iron GJV & ADI	0.50xD	**60**	0.0010	0.0012	**72**	0.0015	**78**	0.0020	0.0025	**84**	0.0028	0.0030
N	Aluminium-wrought alloys Aluminium-cast alloys	0.50xD	**102**	0.0019	0.0023	**122**	0.0029	**133**	0.0038	0.0048	**143**	0.0054	0.0058
N	Copper and copper alloys	0.50xD	**75**	0.0018	0.0021	**90**	0.0027	**97.5**	0.0035	0.0044	**105**	0.0049	0.0053
S	Heat-resistant alloys. Fe-based	0.25xD	**60**	0.0007	0.0009	**72**	0.0011	**78**	0.0014	0.0018	**84**	0.0020	0.0022
S	Heat-resistant alloys. Ni-based. CO-based	0.25xD	**34**	0.0006	0.0007	**41**	0.0009	**44**	0.0012	0.0015	**48**	0.0016	0.0018
S	Titanium alloys & pure titanium	0.25xD	**54**	0.0012	0.0014	**65**	0.0018	**70**	0.0024	0.0030	**76**	0.0034	0.0036


Component courtesy of Langer GmbH & Co. KG

DRILLING

2

Solid carbide drills	*P. 176*
ExclusiveLine micro-precision drills	*P. 205*
HT 800 WP interchangeable insert drilling system	*P. 210*
Single-fluted deep-hole drills EB, straight fluted	*P. 234*
HSS drills	*P. 267*
NC spotting drills	*P. 289*
Twist drills with 3-flats on shank	*P. 294*

DRILLING OVERVIEW

Solid carbide drills

P M N H S K

- With solid carbide drills, extremely good cutting parameters and long tool life with high process reliability can be achieved under stable machining conditions. The tools are designed for drilling up to 65 HRC. The comprehensive product range with proven geometries and application-specific layers ensures precise and economical machining in drilling depths of up to 40xD.

ExclusiveLine micro-precision drills

P M N S K

- The ExclusiveLine micro drills are designed for high-performance machining in almost all materials. With stable machine conditions and high machine performance, they showcase their full performance. The combination of 2-surface ground edge and cutting edge preparation enables high cutting values and ensures optimal chip breakage.

HT 800 WP interchangeable insert drilling system

H

- The ideal drilling system for producing large, high-precision holes in various materials for tool and mould making. The portfolio ranges from Ø 11.0-40.0 mm with a drilling depth of up to 10xD. The clamping principle allows the insert to be changed in the machine. This results in increased process reliability and shorter set-up times. The cutting material, geometry and surface of the interchangeable inserts are perfectly matched to the respective area of application.

Single-fluted deep-hole drills EB, straight fluted

P

- The single straight fluted deep hole drills achieve the best drilling results in areas above 40xD. The solid carbide version covers a diameter range of Ø 1.0-16.0 mm. 80xD hole depths can be achieved with just one tool. With the classic version with a brazed solid carbide head on a steel shank, drilling depths of up to 100xD are possible.

HSS drills

P M N H S K

- Economical and process-reliable solution for small or medium lot sizes as well as for unstable machining conditions. The parabolic flutes enable safe chip removal even at large drilling depths in tool and mould making.

NC spotting drills

P M N H S K

- The NC spotting drills generate the exact starting position for the subsequent deep-hole drilling tools and thus guarantee the best conditions for precise drilling in tool and mould making.



P. 176



P. 205



P. 210



P. 234



P. 267



P. 289

P	M	K	N	S	H	Tool illustration	Drilling depth	Hardness	Shank form	Type	Standard	Tool material	Surface	d1/mm	Article no.	Page
Ratio drills with coolant ducts																
●	○	●	○	○	○		3xD	48 HRC	HA	RT 100 U	DIN 6537 K	VHM	F	3.000 - 20.000	5510	176
●	○	○		○	○		3xD	48 HRC	HA	RT 100 XF	DIN 6537 K	VHM	F	3.000 - 20.000	6498	178
●				●	○		3xD	65 HRC	HA	RT 100 HF	DIN 6537 K	VHM	Y	3.000 - 20.000	8520	180
●	○	●	○	○	○		5xD	48 HRC	HA	RT 100 U	DIN 6537 L	VHM	F	3.000 - 20.000	5511	182
●	○	○		○	○		5xD	48 HRC	HA	RT 100 XF	DIN 6537 L	VHM	F	3.000 - 20.000	5498	184
●				●	○		5xD	65 HRC	HA	RT 100 HF	DIN 6537 L	VHM	Y	3.000 - 20.000	8521	186
●	○	●	○	○	○		7xD	48 HRC	HA	RT 100 U	WN	VHM	F	3.000 - 20.000	5512	188
●	○	○		○	○		7xD	48 HRC	HA	RT 100 XF	WN	VHM	F	3.000 - 20.000	5499	190
●				●	○		7xD	65 HRC	HA	RT 100 HF	WN	VHM	Y	3.000 - 16.000	8522	192
●	○	●	○	○	○		12xD	48 HRC	HA	RT 100 U	WN	VHM	F	3.000 - 20.000	5525	193
●	●	●	○	○	○		15xD	48 HRC	HA	RT 100 T	WN	VHM	A	3.000 - 16.000	6509	195
●	●	●	○	○	○		20xD	48 HRC	HA	RT 100 T	WN	VHM	A	3.000 - 16.000	6511	196
●	●	●	○	○	○		25xD	48 HRC	HA	RT 100 T	WN	VHM	A	3.000 - 16.000	6512	197
●	●	●	○	○	○		30xD	48 HRC	HA	RT 100 T	WN	VHM	A	3.000 - 14.000	6513	198
●	●	●	○	○	○		40xD	48 HRC	HA	RT 100 T	WN	VHM	A	3.000 - 10.000	6514	199
Ratio drills without coolant ducts																
●	○	●	○	○	○		3xD	48 HRC	HA	RT 100 U	DIN 6537 K	VHM	F	3.000 - 20.000	5514	200
●				●	○		3xD	65 HRC	HA	RT 100 HF	DIN 6537 K	VHM	Y	3.000 - 20.000	8524	202
Twist drills with reinforced straight shank																
○		○			●		3xD	65 HRC	HA	H	DIN 6537 K	VHM	A	2.600 - 14.100	1946	204
ExclusiveLine micro-precision drills without coolant ducts																
●	●	●	○	○			4xD	48 HRC	Cyl	N	WN	VHM	A	0.500 - 3.000	6400	205
●	●	●	○	○			7xD	48 HRC	Cyl	N	WN	VHM	A	0.500 - 3.000	6401	206
ExclusiveLine micro-precision drills with coolant ducts																
●	●	●	○	○			5xD	48 HRC	Cyl	N	WN	VHM	A	1.000 - 3.000	6405	207

P	M	K	N	S	H	Tool illustration	Drilling depth	Hard-ness	Shank form	Type	Standard	Tool material	Sur-face	d1/mm	Article no.	Page
ExclusiveLine micro-precision drills with coolant ducts																
●	●	●	○	○			8xD	48 HRC	Cyl	N	WN	VHM	A	1.000 - 3.000	6408	208
●	●	●	○	○			15xD	48 HRC	Cyl	N	WN	VHM	A	1.000 - 3.000	6412	209
Tool holders for interchangeable inserts HT 800																
							1,5xD		HE	HT 800 WP	WN		Ni		4106	210
							3xD		HE	HT 800 WP	WN		Ni		4107	212
							5xD		HE	HT 800 WP	WN		Ni		4108	214
							7xD		HE	HT 800 WP	WN		Ni		4109	216
							10xD		HE	HT 800 WP	WN		Ni		4110	218
Interchangeable inserts HT 800																
○	○	○	○	○	○					HT 800 WP Pilot	WN	VHM	a	11.000 - 40.000	4111	220
●	○	○								HT 800 WP	WN	VHM	F	11.000 - 40.000	4112	223
			●							HT 800 WP	WN	VHM	○	11.000 - 40.000	4114	226
○	●			○	○					HT 800 WP	WN	VHM	a	11.000 - 40.000	4115	229
●										HT 800 WP	WN	VHM	F	12.000 - 40.000	4229	232
EB 100 M single-fluted gun drills																
●	●	○	○	○	○		25xD	48 HRC	HA	EB 100 M	WN	VHM	a	1.000 - 16.000	5646	234
●	●	○	○	○	○		50xD	48 HRC	HA	EB 100 M	WN	VHM	a	1.000 - 10.000	5647	235
●	●	○	○	○	○		75xD	48 HRC	HA	EB 100 M	WN	VHM	a	1.000 - 7.144	5648	236
EB 80 single-fluted gun drills																
○	●	○	○	●	○		20xD	48 HRC	HA	EB 80	WN	HM	C	3.969 - 16.000	5639	237
○	●	○	○	●	○		30xD	48 HRC	HA	EB 80	WN	HM	C	3.969 - 16.000	5640	238
○	●	○	○	●	○		40xD	48 HRC	HA	EB 80	WN	HM	C	3.969 - 16.000	5641	239
○	●	○	○	●	○		60xD	48 HRC	HA	EB 80	WN	HM	C	3.969 - 15.950	5669	240
○	●	○	○	●	○		80xD	48 HRC	HA	EB 80	WN	HM	C	3.969 - 15.950	5642	241

P	M	K	N	S	H	Tool illustration	Drilling depth	Hard-ness	Shank form	Type	Standard	Tool material	Sur-face	d1/mm	Article no.	Page
EB 80 XXL single-fluted gun drills																
●	○	●	●	○	○		GL 600	48 HRC	TBM-SEH	EB 80 XXL	WN	HM	S	3.000 - 25.000	5688	242
●	○	●	●	○	○		GL 800	48 HRC	TBM-SEH	EB 80 XXL	WN	HM	S	3.000 - 25.000	5691	243
●	○	●	●	○	○		GL 1000	48 HRC	TBM-SEH	EB 80 XXL	WN	HM	S	3.000 - 25.000	5164	244
●	○	●	●	○	○		GL 1200	48 HRC	TBM-SEH	EB 80 XXL	WN	HM	S	3.000 - 25.000	5692	245
●	○	●	●	○	○		GL 1400	48 HRC	TBM-SEH	EB 80 XXL	WN	HM	S	4.000 - 25.000	5681	246
●	○	●	●	○	○		GL 1600	48 HRC	TBM-SEH	EB 80 XXL	WN	HM	S	4.000 - 25.000	5693	247
●	○	●	●	○	○		GL 1800	48 HRC	TBM-SEH	EB 80 XXL	WN	HM	S	4.000 - 32.000	5682	248
●	○	●	●	○	○		GL 2000	48 HRC	TBM-SEH	EB 80 XXL	WN	HM	S	4.000 - 32.000	5694	249
Drill bushes																
											WN	VHM			5748	250
											WN	HSS			5747	251
Moulded steady rest bushings for single-fluted gun drills																
											WN				5750	253
											WN				5767	255
Sealing disks for single-fluted gun drills																
											WN				5752	257
											WN				5770	259
											WN				5772	260
Sealing plugs																
											WN			8.000 - 25.000	5766	261
Torque wrenches set																
											WN				4966	262

P	M	K	N	S	H	Tool illustration	Drilling depth	Hard-ness	Shank form	Type	Standard	Tool material	Sur-face	d1/mm	Article no.	Page
Torque wrenches																
											WN				4915	263
Torx screwdrivers																
											WN				1612	264
Torx socket sets																
											WN				4917	265
Clamping screws																
											WN				4071	266
Stub drills																
•	○	•	○	○	○		~3xD		Cyl	GT 500 DZ	DIN 1897	HSS-E-PM	F	1.000 - 14.290	515	267
Jobber drills																
•	○	•	•				~5xD		Cyl	GT 100	DIN 338	HSCO	>Ø 2,36	1.000 - 16.000	622	269
•	○	•	•		○		~5xD		Cyl	GT 100	DIN 338	HSCO	F	1.000 - 16.000	2459	272
Long series twist drills																
•	•	•	•		○		~10xD		Cyl	GT 100	DIN 340	HSCO	>Ø 2,36	1.000 - 16.000	336	274
•	•	•	•		○		~10xD		Cyl	GT 100	DIN 340	HSCO	F	1.000 - 12.000	396	276
Extra length twist drills, series 1																
•	•	•	•	•	○		~15xD		Cyl	GT 100	DIN 1869	HSCO		2.700 - 10.000	618	278
Extra length twist drills, series 2																
•	•	•	•	•	○		~20xD		Cyl	GT 100	DIN 1869	HSCO		3.000 - 10.000	619	279
Extra length twist drills, series 3																
•	•	•	•	•	○		~25xD		Cyl	GT 100	DIN 1869	HSCO		2.500 - 13.000	571	280
Extra length twist drills																
•		•	•				>25xD		Cyl	GT 100	WN	HSS		6.000 - 12.000	242	281
•		•	•				>25xD		Cyl	GT 100	WN	HSS		8.000 - 12.000	243	282
•		•	•				>25xD		Cyl	GT 100	WN	HSS		10.000 - 12.000	244	283
Extra length twist drills, series 1																
•	•	•	•	•	○		~15xD		MK	GT 100	DIN 1870	HSCO	>Ø 16,0	9.520 - 30.000	620	284

P	M	K	N	S	H	Tool illustration	Drilling depth	Hard-ness	Shank form	Type	Standard	Tool material	Sur-face	d1/mm	Article no.	Page
Extra length twist drills, series 2																
•	•	•	•	•	○		~20xD		MK	GT 100	DIN 1870	HSCO	>Ø 16,0	10.000 - 29.500	621	285
Twist drills with coolant ducts																
•	○	•	•	○			~10xD		Cyl	N	WN	HSS	○	3.000 - 13.000	390	286
•	•	•	•	•	○		~5xD		HE	GT 80 IK	WN	HSCO	○	5.000 - 20.000	1131	287
•	•	•	•	•	○		~5xD		HE	GT 80 IK	WN	HSCO	S	5.000 - 20.000	1132	288
90° NC spotting drills																
•	•	•	•	○					B	N	WN	HSCO	F	3.000 - 25.400	5678	289
•	•	•	○	•	○				HB	N	WN	VHM	F	4.000 - 20.000	6027	290
120° NC spotting drills																
•	•	•	•	○					B	N	WN	HSCO	F	3.000 - 25.400	5679	291
•	•	•	○	•	○				HB	N	WN	VHM	F	3.000 - 20.000	6028	292
142° NC spotting drills																
•	•	•	○	•	○				HA/ HB	N	WN	VHM	F	1.000 - 20.000	6029	293
Jobber drills																
•	•	•	•	○			~5xD		3	GU 3FS	DIN 338	HSCO		1.000 - 13.000	9000	294
Twist drill sets																
•	•	•	•	○			~5xD		3	GU 3FS	DIN 338	HSCO			9001	295

RT 100 HF

+ High-performance drill for precise drilling in high-strength materials
+ perfect hole quality thanks to two guide and support chamfers
+ Ø 3–20 mm and 3–7xD in stock



Ratio drills with coolant ducts

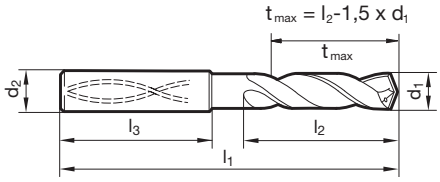
3xD | RT 100 U | DIN 6537 K | 140° | m7 | 48 HRC

Tool material	**Solid carbide**
Surface	F
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • facet point grind • main cutting edge form straight • optimised cutting geometry
M	○	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • steels (alloyed/unalloyed) up to 1200 N/mm² • cast materials
S	○	• bronze, brass • high-alloyed AlSi alloys
H	○	

GÜHRINGNAVIGATOR

Cutting data page 296





Article no. **5510**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	62.00	20.00	36.00	5510 3.000
3.100		6.00	62.00	20.00	36.00	5510 3.100
3.170	1/8	6.00	62.00	20.00	36.00	5510 3.170
3.200		6.00	62.00	20.00	36.00	5510 3.200
3.250		6.00	62.00	20.00	36.00	5510 3.250
3.300		6.00	62.00	20.00	36.00	5510 3.300
3.400		6.00	62.00	20.00	36.00	5510 3.400
3.500		6.00	62.00	20.00	36.00	5510 3.500
3.570	9/64	6.00	62.00	20.00	36.00	5510 3.570
3.600		6.00	62.00	20.00	36.00	5510 3.600
3.700		6.00	62.00	20.00	36.00	5510 3.700
3.800		6.00	66.00	24.00	36.00	5510 3.800
3.900		6.00	66.00	24.00	36.00	5510 3.900
3.970	5/32	6.00	66.00	24.00	36.00	5510 3.970
4.000		6.00	66.00	24.00	36.00	5510 4.000
4.040		6.00	66.00	24.00	36.00	5510 4.040
4.100		6.00	66.00	24.00	36.00	5510 4.100
4.200		6.00	66.00	24.00	36.00	5510 4.200
4.300		6.00	66.00	24.00	36.00	5510 4.300
4.370	11/64	6.00	66.00	24.00	36.00	5510 4.370
4.400		6.00	66.00	24.00	36.00	5510 4.400
4.500		6.00	66.00	24.00	36.00	5510 4.500
4.600		6.00	66.00	24.00	36.00	5510 4.600
4.650		6.00	66.00	24.00	36.00	5510 4.650
4.700		6.00	66.00	24.00	36.00	5510 4.700
4.760	3/16	6.00	66.00	28.00	36.00	5510 4.760
4.800		6.00	66.00	28.00	36.00	5510 4.800
4.900		6.00	66.00	28.00	36.00	5510 4.900
5.000		6.00	66.00	28.00	36.00	5510 5.000
5.100		6.00	66.00	28.00	36.00	5510 5.100
5.110		6.00	66.00	28.00	36.00	5510 5.110
5.160	13/64	6.00	66.00	28.00	36.00	5510 5.160
5.200		6.00	66.00	28.00	36.00	5510 5.200
5.250		6.00	66.00	28.00	36.00	5510 5.250
5.300		6.00	66.00	28.00	36.00	5510 5.300
5.400		6.00	66.00	28.00	36.00	5510 5.400
5.410		6.00	66.00	28.00	36.00	5510 5.410
5.500		6.00	66.00	28.00	36.00	5510 5.500
5.550		6.00	66.00	28.00	36.00	5510 5.550
5.560	7/32	6.00	66.00	28.00	36.00	5510 5.560
5.600		6.00	66.00	28.00	36.00	5510 5.600
5.650		6.00	66.00	28.00	36.00	5510 5.650

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.700		6.00	66.00	28.00	36.00	5510 5.700
5.800		6.00	66.00	28.00	36.00	5510 5.800
5.900		6.00	66.00	28.00	36.00	5510 5.900
5.950	15/64	6.00	66.00	28.00	36.00	5510 5.950
6.000		6.00	66.00	28.00	36.00	5510 6.000
6.100		8.00	79.00	34.00	36.00	5510 6.100
6.200		8.00	79.00	34.00	36.00	5510 6.200
6.300		8.00	79.00	34.00	36.00	5510 6.300
6.350	1/4	8.00	79.00	34.00	36.00	5510 6.350
6.400		8.00	79.00	34.00	36.00	5510 6.400
6.500		8.00	79.00	34.00	36.00	5510 6.500
6.530		8.00	79.00	34.00	36.00	5510 6.530
6.600		8.00	79.00	34.00	36.00	5510 6.600
6.700		8.00	79.00	34.00	36.00	5510 6.700
6.750	17/64	8.00	79.00	34.00	36.00	5510 6.750
6.800		8.00	79.00	34.00	36.00	5510 6.800
6.900		8.00	79.00	34.00	36.00	5510 6.900
7.000		8.00	79.00	34.00	36.00	5510 7.000
7.100		8.00	79.00	41.00	36.00	5510 7.100
7.140	9/32	8.00	79.00	41.00	36.00	5510 7.140
7.200		8.00	79.00	41.00	36.00	5510 7.200
7.300		8.00	79.00	41.00	36.00	5510 7.300
7.400		8.00	79.00	41.00	36.00	5510 7.400
7.450		8.00	79.00	41.00	36.00	5510 7.450
7.500		8.00	79.00	41.00	36.00	5510 7.500
7.540	19/64	8.00	79.00	41.00	36.00	5510 7.540
7.600		8.00	79.00	41.00	36.00	5510 7.600
7.700		8.00	79.00	41.00	36.00	5510 7.700
7.800		8.00	79.00	41.00	36.00	5510 7.800
7.900		8.00	79.00	41.00	36.00	5510 7.900
7.940	5/16	8.00	79.00	41.00	36.00	5510 7.940
8.000		8.00	79.00	41.00	36.00	5510 8.000
8.100		10.00	89.00	47.00	40.00	5510 8.100
8.200		10.00	89.00	47.00	40.00	5510 8.200
8.300		10.00	89.00	47.00	40.00	5510 8.300
8.330	21/64	10.00	89.00	47.00	40.00	5510 8.330
8.400		10.00	89.00	47.00	40.00	5510 8.400
8.500		10.00	89.00	47.00	40.00	5510 8.500
8.550		10.00	89.00	47.00	40.00	5510 8.550
8.600		10.00	89.00	47.00	40.00	5510 8.600
8.700		10.00	89.00	47.00	40.00	5510 8.700
8.730	11/32	10.00	89.00	47.00	40.00	5510 8.730

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
8.800		10.00	89.00	47.00	40.00	5510 8.800
8.900		10.00	89.00	47.00	40.00	5510 8.900
9.000		10.00	89.00	47.00	40.00	5510 9.000
9.100		10.00	89.00	47.00	40.00	5510 9.100
9.130	23/64	10.00	89.00	47.00	40.00	5510 9.130
9.200		10.00	89.00	47.00	40.00	5510 9.200
9.250		10.00	89.00	47.00	40.00	5510 9.250
9.300		10.00	89.00	47.00	40.00	5510 9.300
9.340		10.00	89.00	47.00	40.00	5510 9.340
9.400		10.00	89.00	47.00	40.00	5510 9.400
9.500		10.00	89.00	47.00	40.00	5510 9.500
9.520	3/8	10.00	89.00	47.00	40.00	5510 9.520
9.600		10.00	89.00	47.00	40.00	5510 9.600
9.700		10.00	89.00	47.00	40.00	5510 9.700
9.800		10.00	89.00	47.00	40.00	5510 9.800
9.900		10.00	89.00	47.00	40.00	5510 9.900
9.920	25/64	10.00	89.00	47.00	40.00	5510 9.920
10.000		10.00	89.00	47.00	40.00	5510 10.000
10.100		12.00	102.00	55.00	45.00	5510 10.100
10.200		12.00	102.00	55.00	45.00	5510 10.200
10.300		12.00	102.00	55.00	45.00	5510 10.300
10.320	13/32	12.00	102.00	55.00	45.00	5510 10.320
10.400		12.00	102.00	55.00	45.00	5510 10.400
10.500		12.00	102.00	55.00	45.00	5510 10.500
10.600		12.00	102.00	55.00	45.00	5510 10.600
10.700		12.00	102.00	55.00	45.00	5510 10.700
10.720	27/64	12.00	102.00	55.00	45.00	5510 10.720
10.800		12.00	102.00	55.00	45.00	5510 10.800
10.900		12.00	102.00	55.00	45.00	5510 10.900
11.000		12.00	102.00	55.00	45.00	5510 11.000
11.100		12.00	102.00	55.00	45.00	5510 11.100
11.110	7/16	12.00	102.00	55.00	45.00	5510 11.110
11.200		12.00	102.00	55.00	45.00	5510 11.200
11.300		12.00	102.00	55.00	45.00	5510 11.300
11.400		12.00	102.00	55.00	45.00	5510 11.400
11.500		12.00	102.00	55.00	45.00	5510 11.500
11.510	29/64	12.00	102.00	55.00	45.00	5510 11.510
11.600		12.00	102.00	55.00	45.00	5510 11.600
11.700		12.00	102.00	55.00	45.00	5510 11.700
11.800		12.00	102.00	55.00	45.00	5510 11.800
11.900		12.00	102.00	55.00	45.00	5510 11.900
11.910	15/32	12.00	102.00	55.00	45.00	5510 11.910
12.000		12.00	102.00	55.00	45.00	5510 12.000
12.100		14.00	107.00	60.00	45.00	5510 12.100
12.200		14.00	107.00	60.00	45.00	5510 12.200
12.300	31/64	14.00	107.00	60.00	45.00	5510 12.300
12.400		14.00	107.00	60.00	45.00	5510 12.400
12.500		14.00	107.00	60.00	45.00	5510 12.500
12.600		14.00	107.00	60.00	45.00	5510 12.600
12.700	1/2	14.00	107.00	60.00	45.00	5510 12.700
12.800		14.00	107.00	60.00	45.00	5510 12.800
12.900		14.00	107.00	60.00	45.00	5510 12.900
13.000		14.00	107.00	60.00	45.00	5510 13.000
13.100	33/64	14.00	107.00	60.00	45.00	5510 13.100
13.200		14.00	107.00	60.00	45.00	5510 13.200
13.300		14.00	107.00	60.00	45.00	5510 13.300
13.400		14.00	107.00	60.00	45.00	5510 13.400
13.490	17/32	14.00	107.00	60.00	45.00	5510 13.490
13.500		14.00	107.00	60.00	45.00	5510 13.500
13.600		14.00	107.00	60.00	45.00	5510 13.600
13.700		14.00	107.00	60.00	45.00	5510 13.700
13.800		14.00	107.00	60.00	45.00	5510 13.800
13.890	35/64	14.00	107.00	60.00	45.00	5510 13.890
13.900		14.00	107.00	60.00	45.00	5510 13.900
14.000		14.00	107.00	60.00	45.00	5510 14.000
14.100		16.00	115.00	65.00	48.00	5510 14.100

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
14.200		16.00	115.00	65.00	48.00	5510 14.200
14.290	9/16	16.00	115.00	65.00	48.00	5510 14.290
14.300		16.00	115.00	65.00	48.00	5510 14.300
14.400		16.00	115.00	65.00	48.00	5510 14.400
14.500		16.00	115.00	65.00	48.00	5510 14.500
14.600		16.00	115.00	65.00	48.00	5510 14.600
14.680	37/64	16.00	115.00	65.00	48.00	5510 14.680
14.700		16.00	115.00	65.00	48.00	5510 14.700
14.800		16.00	115.00	65.00	48.00	5510 14.800
14.900		16.00	115.00	65.00	48.00	5510 14.900
15.000		16.00	115.00	65.00	48.00	5510 15.000
15.080	19/32	16.00	115.00	65.00	48.00	5510 15.080
15.100		16.00	115.00	65.00	48.00	5510 15.100
15.200		16.00	115.00	65.00	48.00	5510 15.200
15.300		16.00	115.00	65.00	48.00	5510 15.300
15.400		16.00	115.00	65.00	48.00	5510 15.400
15.480	39/64	16.00	115.00	65.00	48.00	5510 15.480
15.500		16.00	115.00	65.00	48.00	5510 15.500
15.600		16.00	115.00	65.00	48.00	5510 15.600
15.700		16.00	115.00	65.00	48.00	5510 15.700
15.800		16.00	115.00	65.00	48.00	5510 15.800
15.870	5/8	16.00	115.00	65.00	48.00	5510 15.870
15.900		16.00	115.00	65.00	48.00	5510 15.900
16.000		16.00	115.00	65.00	48.00	5510 16.000
16.100		18.00	123.00	73.00	48.00	5510 16.100
16.200		18.00	123.00	73.00	48.00	5510 16.200
16.270	41/64	18.00	123.00	73.00	48.00	5510 16.270
16.500		18.00	123.00	73.00	48.00	5510 16.500
16.670	21/32	18.00	123.00	73.00	48.00	5510 16.670
16.900		18.00	123.00	73.00	48.00	5510 16.900
17.000		18.00	123.00	73.00	48.00	5510 17.000
17.070	43/64	18.00	123.00	73.00	48.00	5510 17.070
17.200		18.00	123.00	73.00	48.00	5510 17.200
17.300		18.00	123.00	73.00	48.00	5510 17.300
17.400		18.00	123.00	73.00	48.00	5510 17.400
17.460	11/16	18.00	123.00	73.00	48.00	5510 17.460
17.500		18.00	123.00	73.00	48.00	5510 17.500
17.600		18.00	123.00	73.00	48.00	5510 17.600
17.700		18.00	123.00	73.00	48.00	5510 17.700
17.860	45/64	18.00	123.00	73.00	48.00	5510 17.860
17.900		18.00	123.00	73.00	48.00	5510 17.900
18.000		18.00	123.00	73.00	48.00	5510 18.000
18.260	23/32	20.00	131.00	79.00	50.00	5510 18.260
18.300		20.00	131.00	79.00	50.00	5510 18.300
18.500		20.00	131.00	79.00	50.00	5510 18.500
18.900		20.00	131.00	79.00	50.00	5510 18.900
19.000		20.00	131.00	79.00	50.00	5510 19.000
19.050	3/4	20.00	131.00	79.00	50.00	5510 19.050
19.250		20.00	131.00	79.00	50.00	5510 19.250
19.300		20.00	131.00	79.00	50.00	5510 19.300
19.446		20.00	131.00	79.00	50.00	5510 19.446
19.500		20.00	131.00	79.00	50.00	5510 19.500
19.840	25/32	20.00	131.00	79.00	50.00	5510 19.840
19.900		20.00	131.00	79.00	50.00	5510 19.900
20.000		20.00	131.00	79.00	50.00	5510 20.000

Ratio drills with coolant ducts

3xD | RT 100 XF | DIN 6537 K | 140° | m7 | 48 HRC

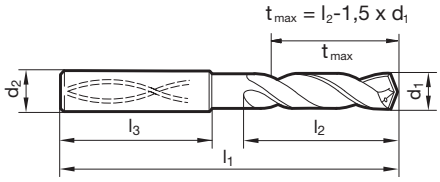
Tool material	Solid carbide
Surface	F
Shank form	HA

NEW

P	•	relieved cone • main cutting edge form concave • optimised cutting geometry • maximum performance • double margin
M	○	
K	○	
N		structural and case hardened steels • free-cutting steels, heat-treatable steels • steels (alloyed/unalloyed) up to 1400 N/mm²
S	○	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 296





Article no. **6498**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	62.00	20.00	36.00	6498 3.000
3.100		6.00	62.00	20.00	36.00	6498 3.100
3.170	1/8	6.00	62.00	20.00	36.00	6498 3.170
3.200		6.00	62.00	20.00	36.00	6498 3.200
3.250		6.00	62.00	20.00	36.00	6498 3.250
3.300		6.00	62.00	20.00	36.00	6498 3.300
3.400		6.00	62.00	20.00	36.00	6498 3.400
3.500		6.00	62.00	20.00	36.00	6498 3.500
3.570	9/64	6.00	62.00	20.00	36.00	6498 3.570
3.600		6.00	62.00	20.00	36.00	6498 3.600
3.700		6.00	62.00	20.00	36.00	6498 3.700
3.800		6.00	66.00	24.00	36.00	6498 3.800
3.900		6.00	66.00	24.00	36.00	6498 3.900
3.970	5/32	6.00	66.00	24.00	36.00	6498 3.970
4.000		6.00	66.00	24.00	36.00	6498 4.000
4.040		6.00	66.00	24.00	36.00	6498 4.040
4.100		6.00	66.00	24.00	36.00	6498 4.100
4.200		6.00	66.00	24.00	36.00	6498 4.200
4.300		6.00	66.00	24.00	36.00	6498 4.300
4.370	11/64	6.00	66.00	24.00	36.00	6498 4.370
4.400		6.00	66.00	24.00	36.00	6498 4.400
4.500		6.00	66.00	24.00	36.00	6498 4.500
4.600		6.00	66.00	24.00	36.00	6498 4.600
4.650		6.00	66.00	24.00	36.00	6498 4.650
4.700		6.00	66.00	24.00	36.00	6498 4.700
4.760	3/16	6.00	66.00	28.00	36.00	6498 4.760
4.800		6.00	66.00	28.00	36.00	6498 4.800
4.900		6.00	66.00	28.00	36.00	6498 4.900
5.000		6.00	66.00	28.00	36.00	6498 5.000
5.100		6.00	66.00	28.00	36.00	6498 5.100
5.110		6.00	66.00	28.00	36.00	6498 5.110
5.160	13/64	6.00	66.00	28.00	36.00	6498 5.160
5.200		6.00	66.00	28.00	36.00	6498 5.200
5.300		6.00	66.00	28.00	36.00	6498 5.300
5.400		6.00	66.00	28.00	36.00	6498 5.400
5.410		6.00	66.00	28.00	36.00	6498 5.410
5.500		6.00	66.00	28.00	36.00	6498 5.500
5.550		6.00	66.00	28.00	36.00	6498 5.550
5.560	7/32	6.00	66.00	28.00	36.00	6498 5.560
5.600		6.00	66.00	28.00	36.00	6498 5.600
5.700		6.00	66.00	28.00	36.00	6498 5.700
5.800		6.00	66.00	28.00	36.00	6498 5.800

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.900		6.00	66.00	28.00	36.00	6498 5.900
5.950	15/64	6.00	66.00	28.00	36.00	6498 5.950
6.000		6.00	66.00	28.00	36.00	6498 6.000
6.100		8.00	79.00	34.00	36.00	6498 6.100
6.200		8.00	79.00	34.00	36.00	6498 6.200
6.300		8.00	79.00	34.00	36.00	6498 6.300
6.350	1/4	8.00	79.00	34.00	36.00	6498 6.350
6.400		8.00	79.00	34.00	36.00	6498 6.400
6.500		8.00	79.00	34.00	36.00	6498 6.500
6.530		8.00	79.00	34.00	36.00	6498 6.530
6.550		8.00	79.00	34.00	36.00	6498 6.550
6.600		8.00	79.00	34.00	36.00	6498 6.600
6.700		8.00	79.00	34.00	36.00	6498 6.700
6.750	17/64	8.00	79.00	34.00	36.00	6498 6.750
6.800		8.00	79.00	34.00	36.00	6498 6.800
6.900		8.00	79.00	34.00	36.00	6498 6.900
7.000		8.00	79.00	34.00	36.00	6498 7.000
7.100		8.00	79.00	41.00	36.00	6498 7.100
7.140	9/32	8.00	79.00	41.00	36.00	6498 7.140
7.200		8.00	79.00	41.00	36.00	6498 7.200
7.300		8.00	79.00	41.00	36.00	6498 7.300
7.400		8.00	79.00	41.00	36.00	6498 7.400
7.500		8.00	79.00	41.00	36.00	6498 7.500
7.540	19/64	8.00	79.00	41.00	36.00	6498 7.540
7.550		8.00	79.00	41.00	36.00	6498 7.550
7.600		8.00	79.00	41.00	36.00	6498 7.600
7.650		8.00	79.00	41.00	36.00	6498 7.650
7.700		8.00	79.00	41.00	36.00	6498 7.700
7.800		8.00	79.00	41.00	36.00	6498 7.800
7.900		8.00	79.00	41.00	36.00	6498 7.900
7.940	5/16	8.00	79.00	41.00	36.00	6498 7.940
8.000		8.00	79.00	41.00	36.00	6498 8.000
8.100		10.00	89.00	47.00	40.00	6498 8.100
8.200		10.00	89.00	47.00	40.00	6498 8.200
8.300		10.00	89.00	47.00	40.00	6498 8.300
8.330	21/64	10.00	89.00	47.00	40.00	6498 8.330
8.400		10.00	89.00	47.00	40.00	6498 8.400
8.500		10.00	89.00	47.00	40.00	6498 8.500
8.600		10.00	89.00	47.00	40.00	6498 8.600
8.700		10.00	89.00	47.00	40.00	6498 8.700
8.730	11/32	10.00	89.00	47.00	40.00	6498 8.730
8.800		10.00	89.00	47.00	40.00	6498 8.800

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
8.900		10.00	89.00	47.00	40.00	6498 8.900
9.000		10.00	89.00	47.00	40.00	6498 9.000
9.100		10.00	89.00	47.00	40.00	6498 9.100
9.130	23/64	10.00	89.00	47.00	40.00	6498 9.130
9.200		10.00	89.00	47.00	40.00	6498 9.200
9.250		10.00	89.00	47.00	40.00	6498 9.250
9.300		10.00	89.00	47.00	40.00	6498 9.300
9.340		10.00	89.00	47.00	40.00	6498 9.340
9.400		10.00	89.00	47.00	40.00	6498 9.400
9.500		10.00	89.00	47.00	40.00	6498 9.500
9.520	3/8	10.00	89.00	47.00	40.00	6498 9.520
9.550		10.00	89.00	47.00	40.00	6498 9.550
9.600		10.00	89.00	47.00	40.00	6498 9.600
9.700		10.00	89.00	47.00	40.00	6498 9.700
9.800		10.00	89.00	47.00	40.00	6498 9.800
9.900		10.00	89.00	47.00	40.00	6498 9.900
9.920	25/64	10.00	89.00	47.00	40.00	6498 9.920
10.000		10.00	89.00	47.00	40.00	6498 10.000
10.100		12.00	102.00	55.00	45.00	6498 10.100
10.200		12.00	102.00	55.00	45.00	6498 10.200
10.300		12.00	102.00	55.00	45.00	6498 10.300
10.320	13/32	12.00	102.00	55.00	45.00	6498 10.320
10.400		12.00	102.00	55.00	45.00	6498 10.400
10.500		12.00	102.00	55.00	45.00	6498 10.500
10.600		12.00	102.00	55.00	45.00	6498 10.600
10.700		12.00	102.00	55.00	45.00	6498 10.700
10.720	27/64	12.00	102.00	55.00	45.00	6498 10.720
10.800		12.00	102.00	55.00	45.00	6498 10.800
10.900		12.00	102.00	55.00	45.00	6498 10.900
11.000		12.00	102.00	55.00	45.00	6498 11.000
11.100		12.00	102.00	55.00	45.00	6498 11.100
11.110	7/16	12.00	102.00	55.00	45.00	6498 11.110
11.200		12.00	102.00	55.00	45.00	6498 11.200
11.300		12.00	102.00	55.00	45.00	6498 11.300
11.400		12.00	102.00	55.00	45.00	6498 11.400
11.500		12.00	102.00	55.00	45.00	6498 11.500
11.510	29/64	12.00	102.00	55.00	45.00	6498 11.510
11.550		12.00	102.00	55.00	45.00	6498 11.550
11.600		12.00	102.00	55.00	45.00	6498 11.600
11.700		12.00	102.00	55.00	45.00	6498 11.700
11.800		12.00	102.00	55.00	45.00	6498 11.800
11.900		12.00	102.00	55.00	45.00	6498 11.900
11.910	15/32	12.00	102.00	55.00	45.00	6498 11.910
12.000		12.00	102.00	55.00	45.00	6498 12.000
12.100		14.00	107.00	60.00	45.00	6498 12.100
12.200		14.00	107.00	60.00	45.00	6498 12.200
12.300	31/64	14.00	107.00	60.00	45.00	6498 12.300
12.400		14.00	107.00	60.00	45.00	6498 12.400
12.500		14.00	107.00	60.00	45.00	6498 12.500
12.600		14.00	107.00	60.00	45.00	6498 12.600
12.700	1/2	14.00	107.00	60.00	45.00	6498 12.700
12.800		14.00	107.00	60.00	45.00	6498 12.800
12.900		14.00	107.00	60.00	45.00	6498 12.900
13.000		14.00	107.00	60.00	45.00	6498 13.000
13.100	33/64	14.00	107.00	60.00	45.00	6498 13.100
13.200		14.00	107.00	60.00	45.00	6498 13.200
13.300		14.00	107.00	60.00	45.00	6498 13.300
13.400		14.00	107.00	60.00	45.00	6498 13.400
13.490	17/32	14.00	107.00	60.00	45.00	6498 13.490
13.500		14.00	107.00	60.00	45.00	6498 13.500
13.600		14.00	107.00	60.00	45.00	6498 13.600
13.700		14.00	107.00	60.00	45.00	6498 13.700
13.800		14.00	107.00	60.00	45.00	6498 13.800
13.890	35/64	14.00	107.00	60.00	45.00	6498 13.890
13.900		14.00	107.00	60.00	45.00	6498 13.900
14.000		14.00	107.00	60.00	45.00	6498 14.000

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
14.100		16.00	115.00	65.00	48.00	6498 14.100
14.200		16.00	115.00	65.00	48.00	6498 14.200
14.290	9/16	16.00	115.00	65.00	48.00	6498 14.290
14.300		16.00	115.00	65.00	48.00	6498 14.300
14.400		16.00	115.00	65.00	48.00	6498 14.400
14.500		16.00	115.00	65.00	48.00	6498 14.500
14.600		16.00	115.00	65.00	48.00	6498 14.600
14.680	37/64	16.00	115.00	65.00	48.00	6498 14.680
14.700		16.00	115.00	65.00	48.00	6498 14.700
14.800		16.00	115.00	65.00	48.00	6498 14.800
14.900		16.00	115.00	65.00	48.00	6498 14.900
15.000		16.00	115.00	65.00	48.00	6498 15.000
15.080	19/32	16.00	115.00	65.00	48.00	6498 15.080
15.100		16.00	115.00	65.00	48.00	6498 15.100
15.200		16.00	115.00	65.00	48.00	6498 15.200
15.300		16.00	115.00	65.00	48.00	6498 15.300
15.400		16.00	115.00	65.00	48.00	6498 15.400
15.480	39/64	16.00	115.00	65.00	48.00	6498 15.480
15.500		16.00	115.00	65.00	48.00	6498 15.500
15.550		16.00	115.00	65.00	48.00	6498 15.550
15.600		16.00	115.00	65.00	48.00	6498 15.600
15.700		16.00	115.00	65.00	48.00	6498 15.700
15.800		16.00	115.00	65.00	48.00	6498 15.800
15.870	5/8	16.00	115.00	65.00	48.00	6498 15.870
15.900		16.00	115.00	65.00	48.00	6498 15.900
16.000		16.00	115.00	65.00	48.00	6498 16.000
16.270	41/64	18.00	123.00	73.00	48.00	6498 16.270
16.300		18.00	123.00	73.00	48.00	6498 16.300
16.500		18.00	123.00	73.00	48.00	6498 16.500
16.670	21/32	18.00	123.00	73.00	48.00	6498 16.670
16.700		18.00	123.00	73.00	48.00	6498 16.700
16.900		18.00	123.00	73.00	48.00	6498 16.900
17.000		18.00	123.00	73.00	48.00	6498 17.000
17.070	43/64	18.00	123.00	73.00	48.00	6498 17.070
17.460	11/16	18.00	123.00	73.00	48.00	6498 17.460
17.500		18.00	123.00	73.00	48.00	6498 17.500
17.550		18.00	123.00	73.00	48.00	6498 17.550
17.700		18.00	123.00	73.00	48.00	6498 17.700
17.860	45/64	18.00	123.00	73.00	48.00	6498 17.860
18.000		18.00	123.00	73.00	48.00	6498 18.000
18.260	23/32	20.00	131.00	79.00	50.00	6498 18.260
18.500		20.00	131.00	79.00	50.00	6498 18.500
18.700		20.00	131.00	79.00	50.00	6498 18.700
18.900		20.00	131.00	79.00	50.00	6498 18.900
19.000		20.00	131.00	79.00	50.00	6498 19.000
19.050	3/4	20.00	131.00	79.00	50.00	6498 19.050
19.250		20.00	131.00	79.00	50.00	6498 19.250
19.300		20.00	131.00	79.00	50.00	6498 19.300
19.450	49/64	20.00	131.00	79.00	50.00	6498 19.450
19.500		20.00	131.00	79.00	50.00	6498 19.500
19.550		20.00	131.00	79.00	50.00	6498 19.550
19.700		20.00	131.00	79.00	50.00	6498 19.700
19.800		20.00	131.00	79.00	50.00	6498 19.800
19.840	25/32	20.00	131.00	79.00	50.00	6498 19.840
20.000		20.00	131.00	79.00	50.00	6498 20.000

Ratio drills with coolant ducts

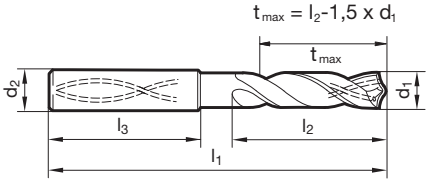
3xD | RT 100 HF | DIN 6537 K | 140° | m7 | 65 HRC

Tool material	Solid carbide
Surface	Y
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • relieved cone • main cutting edge is slightly concave • optimised cutting geometry • double margin
M		
K		
N		alloyed and high tensile steels up to 1600 N/mm² • Inconel, Hastelloy, Monel • Titanium and Titanium alloys
S	•	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 296





Article no. **8520**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	62.00	20.00	36.00	8520 3.000
3.100		6.00	62.00	20.00	36.00	8520 3.100
3.170	1/8	6.00	62.00	20.00	36.00	8520 3.170
3.200		6.00	62.00	20.00	36.00	8520 3.200
3.250		6.00	62.00	20.00	36.00	8520 3.250
3.300		6.00	62.00	20.00	36.00	8520 3.300
3.400		6.00	62.00	20.00	36.00	8520 3.400
3.500		6.00	62.00	20.00	36.00	8520 3.500
3.570	9/64	6.00	62.00	20.00	36.00	8520 3.570
3.600		6.00	62.00	20.00	36.00	8520 3.600
3.700		6.00	62.00	20.00	36.00	8520 3.700
3.800		6.00	66.00	24.00	36.00	8520 3.800
3.900		6.00	66.00	24.00	36.00	8520 3.900
3.970	5/32	6.00	66.00	24.00	36.00	8520 3.970
4.000		6.00	66.00	24.00	36.00	8520 4.000
4.100		6.00	66.00	24.00	36.00	8520 4.100
4.200		6.00	66.00	24.00	36.00	8520 4.200
4.300		6.00	66.00	24.00	36.00	8520 4.300
4.370	11/64	6.00	66.00	24.00	36.00	8520 4.370
4.400		6.00	66.00	24.00	36.00	8520 4.400
4.500		6.00	66.00	24.00	36.00	8520 4.500
4.600		6.00	66.00	24.00	36.00	8520 4.600
4.650		6.00	66.00	24.00	36.00	8520 4.650
4.700		6.00	66.00	24.00	36.00	8520 4.700
4.760	3/16	6.00	66.00	28.00	36.00	8520 4.760
4.800		6.00	66.00	28.00	36.00	8520 4.800
4.900		6.00	66.00	28.00	36.00	8520 4.900
5.000		6.00	66.00	28.00	36.00	8520 5.000
5.100		6.00	66.00	28.00	36.00	8520 5.100
5.160	13/64	6.00	66.00	28.00	36.00	8520 5.160
5.200		6.00	66.00	28.00	36.00	8520 5.200
5.300		6.00	66.00	28.00	36.00	8520 5.300
5.400		6.00	66.00	28.00	36.00	8520 5.400
5.500		6.00	66.00	28.00	36.00	8520 5.500
5.550		6.00	66.00	28.00	36.00	8520 5.550
5.560	7/32	6.00	66.00	28.00	36.00	8520 5.560
5.600		6.00	66.00	28.00	36.00	8520 5.600
5.700		6.00	66.00	28.00	36.00	8520 5.700
5.800		6.00	66.00	28.00	36.00	8520 5.800
5.900		6.00	66.00	28.00	36.00	8520 5.900
5.950	15/64	6.00	66.00	28.00	36.00	8520 5.950
6.000		6.00	66.00	28.00	36.00	8520 6.000

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
6.100		8.00	79.00	34.00	36.00	8520 6.100
6.200		8.00	79.00	34.00	36.00	8520 6.200
6.300		8.00	79.00	34.00	36.00	8520 6.300
6.350	1/4	8.00	79.00	34.00	36.00	8520 6.350
6.400		8.00	79.00	34.00	36.00	8520 6.400
6.500		8.00	79.00	34.00	36.00	8520 6.500
6.600		8.00	79.00	34.00	36.00	8520 6.600
6.700		8.00	79.00	34.00	36.00	8520 6.700
6.750	17/64	8.00	79.00	34.00	36.00	8520 6.750
6.800		8.00	79.00	34.00	36.00	8520 6.800
6.900		8.00	79.00	34.00	36.00	8520 6.900
7.000		8.00	79.00	34.00	36.00	8520 7.000
7.100		8.00	79.00	41.00	36.00	8520 7.100
7.140	9/32	8.00	79.00	41.00	36.00	8520 7.140
7.200		8.00	79.00	41.00	36.00	8520 7.200
7.300		8.00	79.00	41.00	36.00	8520 7.300
7.400		8.00	79.00	41.00	36.00	8520 7.400
7.500		8.00	79.00	41.00	36.00	8520 7.500
7.540	19/64	8.00	79.00	41.00	36.00	8520 7.540
7.600		8.00	79.00	41.00	36.00	8520 7.600
7.700		8.00	79.00	41.00	36.00	8520 7.700
7.800		8.00	79.00	41.00	36.00	8520 7.800
7.900		8.00	79.00	41.00	36.00	8520 7.900
7.940	5/16	8.00	79.00	41.00	36.00	8520 7.940
8.000		8.00	79.00	41.00	36.00	8520 8.000
8.100		10.00	89.00	47.00	40.00	8520 8.100
8.200		10.00	89.00	47.00	40.00	8520 8.200
8.300		10.00	89.00	47.00	40.00	8520 8.300
8.330	21/64	10.00	89.00	47.00	40.00	8520 8.330
8.400		10.00	89.00	47.00	40.00	8520 8.400
8.500		10.00	89.00	47.00	40.00	8520 8.500
8.600		10.00	89.00	47.00	40.00	8520 8.600
8.700		10.00	89.00	47.00	40.00	8520 8.700
8.730	11/32	10.00	89.00	47.00	40.00	8520 8.730
8.800		10.00	89.00	47.00	40.00	8520 8.800
8.900		10.00	89.00	47.00	40.00	8520 8.900
9.000		10.00	89.00	47.00	40.00	8520 9.000
9.100		10.00	89.00	47.00	40.00	8520 9.100
9.130	23/64	10.00	89.00	47.00	40.00	8520 9.130
9.200		10.00	89.00	47.00	40.00	8520 9.200
9.250		10.00	89.00	47.00	40.00	8520 9.250
9.300		10.00	89.00	47.00	40.00	8520 9.300

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
9.400		10.00	89.00	47.00	40.00	8520 9.400
9.500		10.00	89.00	47.00	40.00	8520 9.500
9.520	3/8	10.00	89.00	47.00	40.00	8520 9.520
9.600		10.00	89.00	47.00	40.00	8520 9.600
9.700		10.00	89.00	47.00	40.00	8520 9.700
9.800		10.00	89.00	47.00	40.00	8520 9.800
9.900		10.00	89.00	47.00	40.00	8520 9.900
9.920	25/64	10.00	89.00	47.00	40.00	8520 9.920
10.000		10.00	89.00	47.00	40.00	8520 10.000
10.100		12.00	102.00	55.00	45.00	8520 10.100
10.200		12.00	102.00	55.00	45.00	8520 10.200
10.300		12.00	102.00	55.00	45.00	8520 10.300
10.320	13/32	12.00	102.00	55.00	45.00	8520 10.320
10.400		12.00	102.00	55.00	45.00	8520 10.400
10.500		12.00	102.00	55.00	45.00	8520 10.500
10.600		12.00	102.00	55.00	45.00	8520 10.600
10.700		12.00	102.00	55.00	45.00	8520 10.700
10.720	27/64	12.00	102.00	55.00	45.00	8520 10.720
10.800		12.00	102.00	55.00	45.00	8520 10.800
10.900		12.00	102.00	55.00	45.00	8520 10.900
11.000		12.00	102.00	55.00	45.00	8520 11.000
11.100		12.00	102.00	55.00	45.00	8520 11.100
11.110	7/16	12.00	102.00	55.00	45.00	8520 11.110
11.200		12.00	102.00	55.00	45.00	8520 11.200
11.300		12.00	102.00	55.00	45.00	8520 11.300
11.400		12.00	102.00	55.00	45.00	8520 11.400
11.500		12.00	102.00	55.00	45.00	8520 11.500
11.510	29/64	12.00	102.00	55.00	45.00	8520 11.510
11.600		12.00	102.00	55.00	45.00	8520 11.600
11.700		12.00	102.00	55.00	45.00	8520 11.700
11.800		12.00	102.00	55.00	45.00	8520 11.800
11.900		12.00	102.00	55.00	45.00	8520 11.900
11.910	15/32	12.00	102.00	55.00	45.00	8520 11.910
12.000		12.00	102.00	55.00	45.00	8520 12.000
12.200		14.00	107.00	60.00	45.00	8520 12.200
12.300	31/64	14.00	107.00	60.00	45.00	8520 12.300

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
12.500		14.00	107.00	60.00	45.00	8520 12.500
12.700	1/2	14.00	107.00	60.00	45.00	8520 12.700
12.800		14.00	107.00	60.00	45.00	8520 12.800
13.000		14.00	107.00	60.00	45.00	8520 13.000
13.300		14.00	107.00	60.00	45.00	8520 13.300
13.490	17/32	14.00	107.00	60.00	45.00	8520 13.490
13.500		14.00	107.00	60.00	45.00	8520 13.500
13.700		14.00	107.00	60.00	45.00	8520 13.700
14.000		14.00	107.00	60.00	45.00	8520 14.000
14.200		16.00	115.00	65.00	48.00	8520 14.200
14.290	9/16	16.00	115.00	65.00	48.00	8520 14.290
14.300		16.00	115.00	65.00	48.00	8520 14.300
14.500		16.00	115.00	65.00	48.00	8520 14.500
14.700		16.00	115.00	65.00	48.00	8520 14.700
15.000		16.00	115.00	65.00	48.00	8520 15.000
15.200		16.00	115.00	65.00	48.00	8520 15.200
15.300		16.00	115.00	65.00	48.00	8520 15.300
15.500		16.00	115.00	65.00	48.00	8520 15.500
15.700		16.00	115.00	65.00	48.00	8520 15.700
15.870	5/8	16.00	115.00	65.00	48.00	8520 15.870
16.000		16.00	115.00	65.00	48.00	8520 16.000
16.300		18.00	123.00	73.00	48.00	8520 16.300
16.500		18.00	123.00	73.00	48.00	8520 16.500
16.900		18.00	123.00	73.00	48.00	8520 16.900
17.000		18.00	123.00	73.00	48.00	8520 17.000
17.300		18.00	123.00	73.00	48.00	8520 17.300
17.500		18.00	123.00	73.00	48.00	8520 17.500
18.000		18.00	123.00	73.00	48.00	8520 18.000
18.500		20.00	131.00	79.00	50.00	8520 18.500
18.900		20.00	131.00	79.00	50.00	8520 18.900
19.000		20.00	131.00	79.00	50.00	8520 19.000
19.050	3/4	20.00	131.00	79.00	50.00	8520 19.050
19.300		20.00	131.00	79.00	50.00	8520 19.300
19.500		20.00	131.00	79.00	50.00	8520 19.500
20.000		20.00	131.00	79.00	50.00	8520 20.000

Ratio drills with coolant ducts

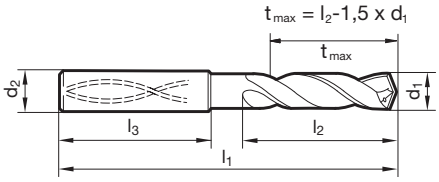
5xD | RT 100 U | DIN 6537 L | 140° | m7 | 48 HRC

Tool material	Solid carbide
Surface	F
Shank form	HA

P ●	web thinning ≥ Ø 3.000 • facet point grind • main cutting edge form straight • optimised cutting geometry
M ○	
K ●	
N ○	structural and case hardened steels • free-cutting steels, heat-treatable steels • steels (alloyed/unalloyed) up to 1200 N/mm² • cast materials
S ○	• bronze, brass • high-alloyed AlSi alloys
H ○	

GÜHRINGNAVIGATOR

Cutting data page 296





Article no. **5511**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	66.00	28.00	36.00	5511 3.000
3.100		6.00	66.00	28.00	36.00	5511 3.100
3.170	1/8	6.00	66.00	28.00	36.00	5511 3.170
3.200		6.00	66.00	28.00	36.00	5511 3.200
3.250		6.00	66.00	28.00	36.00	5511 3.250
3.300		6.00	66.00	28.00	36.00	5511 3.300
3.400		6.00	66.00	28.00	36.00	5511 3.400
3.500		6.00	66.00	28.00	36.00	5511 3.500
3.570	9/64	6.00	66.00	28.00	36.00	5511 3.570
3.600		6.00	66.00	28.00	36.00	5511 3.600
3.700		6.00	66.00	28.00	36.00	5511 3.700
3.800		6.00	74.00	36.00	36.00	5511 3.800
3.900		6.00	74.00	36.00	36.00	5511 3.900
3.970	5/32	6.00	74.00	36.00	36.00	5511 3.970
4.000		6.00	74.00	36.00	36.00	5511 4.000
4.040		6.00	74.00	36.00	36.00	5511 4.040
4.100		6.00	74.00	36.00	36.00	5511 4.100
4.200		6.00	74.00	36.00	36.00	5511 4.200
4.300		6.00	74.00	36.00	36.00	5511 4.300
4.370	11/64	6.00	74.00	36.00	36.00	5511 4.370
4.400		6.00	74.00	36.00	36.00	5511 4.400
4.500		6.00	74.00	36.00	36.00	5511 4.500
4.600		6.00	74.00	36.00	36.00	5511 4.600
4.650		6.00	74.00	36.00	36.00	5511 4.650
4.700		6.00	74.00	36.00	36.00	5511 4.700
4.760	3/16	6.00	82.00	44.00	36.00	5511 4.760
4.800		6.00	82.00	44.00	36.00	5511 4.800
4.900		6.00	82.00	44.00	36.00	5511 4.900
5.000		6.00	82.00	44.00	36.00	5511 5.000
5.100		6.00	82.00	44.00	36.00	5511 5.100
5.110		6.00	82.00	44.00	36.00	5511 5.110
5.160	13/64	6.00	82.00	44.00	36.00	5511 5.160
5.200		6.00	82.00	44.00	36.00	5511 5.200
5.250		6.00	82.00	44.00	36.00	5511 5.250
5.300		6.00	82.00	44.00	36.00	5511 5.300
5.400		6.00	82.00	44.00	36.00	5511 5.400
5.410		6.00	82.00	44.00	36.00	5511 5.410
5.500		6.00	82.00	44.00	36.00	5511 5.500
5.550		6.00	82.00	44.00	36.00	5511 5.550
5.560	7/32	6.00	82.00	44.00	36.00	5511 5.560
5.600		6.00	82.00	44.00	36.00	5511 5.600
5.700		6.00	82.00	44.00	36.00	5511 5.700

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.800		6.00	82.00	44.00	36.00	5511 5.800
5.900		6.00	82.00	44.00	36.00	5511 5.900
5.950	15/64	6.00	82.00	44.00	36.00	5511 5.950
6.000		6.00	82.00	44.00	36.00	5511 6.000
6.100		8.00	91.00	53.00	36.00	5511 6.100
6.200		8.00	91.00	53.00	36.00	5511 6.200
6.300		8.00	91.00	53.00	36.00	5511 6.300
6.350	1/4	8.00	91.00	53.00	36.00	5511 6.350
6.400		8.00	91.00	53.00	36.00	5511 6.400
6.500		8.00	91.00	53.00	36.00	5511 6.500
6.530		8.00	91.00	53.00	36.00	5511 6.530
6.600		8.00	91.00	53.00	36.00	5511 6.600
6.700		8.00	91.00	53.00	36.00	5511 6.700
6.750	17/64	8.00	91.00	53.00	36.00	5511 6.750
6.800		8.00	91.00	53.00	36.00	5511 6.800
6.900		8.00	91.00	53.00	36.00	5511 6.900
7.000		8.00	91.00	53.00	36.00	5511 7.000
7.100		8.00	91.00	53.00	36.00	5511 7.100
7.140	9/32	8.00	91.00	53.00	36.00	5511 7.140
7.200		8.00	91.00	53.00	36.00	5511 7.200
7.300		8.00	91.00	53.00	36.00	5511 7.300
7.400		8.00	91.00	53.00	36.00	5511 7.400
7.500		8.00	91.00	53.00	36.00	5511 7.500
7.540	19/64	8.00	91.00	53.00	36.00	5511 7.540
7.600		8.00	91.00	53.00	36.00	5511 7.600
7.700		8.00	91.00	53.00	36.00	5511 7.700
7.800		8.00	91.00	53.00	36.00	5511 7.800
7.900		8.00	91.00	53.00	36.00	5511 7.900
7.940	5/16	8.00	91.00	53.00	36.00	5511 7.940
8.000		8.00	91.00	53.00	36.00	5511 8.000
8.100		10.00	103.00	61.00	40.00	5511 8.100
8.200		10.00	103.00	61.00	40.00	5511 8.200
8.300		10.00	103.00	61.00	40.00	5511 8.300
8.330	21/64	10.00	103.00	61.00	40.00	5511 8.330
8.400		10.00	103.00	61.00	40.00	5511 8.400
8.500		10.00	103.00	61.00	40.00	5511 8.500
8.600		10.00	103.00	61.00	40.00	5511 8.600
8.700		10.00	103.00	61.00	40.00	5511 8.700
8.730	11/32	10.00	103.00	61.00	40.00	5511 8.730
8.800		10.00	103.00	61.00	40.00	5511 8.800
8.900		10.00	103.00	61.00	40.00	5511 8.900
9.000		10.00	103.00	61.00	40.00	5511 9.000

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
9.100		10.00	103.00	61.00	40.00	5511 9.100
9.130	23/64	10.00	103.00	61.00	40.00	5511 9.130
9.200		10.00	103.00	61.00	40.00	5511 9.200
9.250		10.00	103.00	61.00	40.00	5511 9.250
9.300		10.00	103.00	61.00	40.00	5511 9.300
9.340		10.00	103.00	61.00	40.00	5511 9.340
9.400		10.00	103.00	61.00	40.00	5511 9.400
9.500		10.00	103.00	61.00	40.00	5511 9.500
9.520	3/8	10.00	103.00	61.00	40.00	5511 9.520
9.600		10.00	103.00	61.00	40.00	5511 9.600
9.700		10.00	103.00	61.00	40.00	5511 9.700
9.800		10.00	103.00	61.00	40.00	5511 9.800
9.900		10.00	103.00	61.00	40.00	5511 9.900
9.920	25/64	10.00	103.00	61.00	40.00	5511 9.920
10.000		10.00	103.00	61.00	40.00	5511 10.000
10.100		12.00	118.00	71.00	45.00	5511 10.100
10.200		12.00	118.00	71.00	45.00	5511 10.200
10.300		12.00	118.00	71.00	45.00	5511 10.300
10.320	13/32	12.00	118.00	71.00	45.00	5511 10.320
10.400		12.00	118.00	71.00	45.00	5511 10.400
10.500		12.00	118.00	71.00	45.00	5511 10.500
10.600		12.00	118.00	71.00	45.00	5511 10.600
10.700		12.00	118.00	71.00	45.00	5511 10.700
10.720	27/64	12.00	118.00	71.00	45.00	5511 10.720
10.800		12.00	118.00	71.00	45.00	5511 10.800
10.900		12.00	118.00	71.00	45.00	5511 10.900
11.000		12.00	118.00	71.00	45.00	5511 11.000
11.100		12.00	118.00	71.00	45.00	5511 11.100
11.110	7/16	12.00	118.00	71.00	45.00	5511 11.110
11.200		12.00	118.00	71.00	45.00	5511 11.200
11.300		12.00	118.00	71.00	45.00	5511 11.300
11.400		12.00	118.00	71.00	45.00	5511 11.400
11.500		12.00	118.00	71.00	45.00	5511 11.500
11.510	29/64	12.00	118.00	71.00	45.00	5511 11.510
11.600		12.00	118.00	71.00	45.00	5511 11.600
11.700		12.00	118.00	71.00	45.00	5511 11.700
11.800		12.00	118.00	71.00	45.00	5511 11.800
11.900		12.00	118.00	71.00	45.00	5511 11.900
11.910	15/32	12.00	118.00	71.00	45.00	5511 11.910
12.000		12.00	118.00	71.00	45.00	5511 12.000
12.100		14.00	124.00	77.00	45.00	5511 12.100
12.200		14.00	124.00	77.00	45.00	5511 12.200
12.300	31/64	14.00	124.00	77.00	45.00	5511 12.300
12.400		14.00	124.00	77.00	45.00	5511 12.400
12.500		14.00	124.00	77.00	45.00	5511 12.500
12.600		14.00	124.00	77.00	45.00	5511 12.600
12.700	1/2	14.00	124.00	77.00	45.00	5511 12.700
12.800		14.00	124.00	77.00	45.00	5511 12.800
12.900		14.00	124.00	77.00	45.00	5511 12.900
13.000		14.00	124.00	77.00	45.00	5511 13.000
13.100	33/64	14.00	124.00	77.00	45.00	5511 13.100
13.200		14.00	124.00	77.00	45.00	5511 13.200
13.300		14.00	124.00	77.00	45.00	5511 13.300
13.400		14.00	124.00	77.00	45.00	5511 13.400
13.490	17/32	14.00	124.00	77.00	45.00	5511 13.490
13.500		14.00	124.00	77.00	45.00	5511 13.500
13.600		14.00	124.00	77.00	45.00	5511 13.600
13.700		14.00	124.00	77.00	45.00	5511 13.700
13.800		14.00	124.00	77.00	45.00	5511 13.800
13.890	35/64	14.00	124.00	77.00	45.00	5511 13.890

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
13.900		14.00	124.00	77.00	45.00	5511 13.900
14.000		14.00	124.00	77.00	45.00	5511 14.000
14.100		16.00	133.00	83.00	48.00	5511 14.100
14.200		16.00	133.00	83.00	48.00	5511 14.200
14.290	9/16	16.00	133.00	83.00	48.00	5511 14.290
14.300		16.00	133.00	83.00	48.00	5511 14.300
14.400		16.00	133.00	83.00	48.00	5511 14.400
14.500		16.00	133.00	83.00	48.00	5511 14.500
14.600		16.00	133.00	83.00	48.00	5511 14.600
14.680	37/64	16.00	133.00	83.00	48.00	5511 14.680
14.700		16.00	133.00	83.00	48.00	5511 14.700
14.800		16.00	133.00	83.00	48.00	5511 14.800
14.900		16.00	133.00	83.00	48.00	5511 14.900
15.000		16.00	133.00	83.00	48.00	5511 15.000
15.080	19/32	16.00	133.00	83.00	48.00	5511 15.080
15.100		16.00	133.00	83.00	48.00	5511 15.100
15.200		16.00	133.00	83.00	48.00	5511 15.200
15.300		16.00	133.00	83.00	48.00	5511 15.300
15.400		16.00	133.00	83.00	48.00	5511 15.400
15.480	39/64	16.00	133.00	83.00	48.00	5511 15.480
15.500		16.00	133.00	83.00	48.00	5511 15.500
15.600		16.00	133.00	83.00	48.00	5511 15.600
15.700		16.00	133.00	83.00	48.00	5511 15.700
15.800		16.00	133.00	83.00	48.00	5511 15.800
15.870	5/8	16.00	133.00	83.00	48.00	5511 15.870
15.900		16.00	133.00	83.00	48.00	5511 15.900
16.000		16.00	133.00	83.00	48.00	5511 16.000
16.080		18.00	143.00	93.00	48.00	5511 16.080
16.270	41/64	18.00	143.00	93.00	48.00	5511 16.270
16.500		18.00	143.00	93.00	48.00	5511 16.500
16.670	21/32	18.00	143.00	93.00	48.00	5511 16.670
16.700		18.00	143.00	93.00	48.00	5511 16.700
16.900		18.00	143.00	93.00	48.00	5511 16.900
17.000		18.00	143.00	93.00	48.00	5511 17.000
17.070	43/64	18.00	143.00	93.00	48.00	5511 17.070
17.460	11/16	18.00	143.00	93.00	48.00	5511 17.460
17.500		18.00	143.00	93.00	48.00	5511 17.500
17.700		18.00	143.00	93.00	48.00	5511 17.700
17.860	45/64	18.00	143.00	93.00	48.00	5511 17.860
18.000		18.00	143.00	93.00	48.00	5511 18.000
18.500		20.00	153.00	101.00	50.00	5511 18.500
18.700		20.00	153.00	101.00	50.00	5511 18.700
18.900		20.00	153.00	101.00	50.00	5511 18.900
19.000		20.00	153.00	101.00	50.00	5511 19.000
19.050	3/4	20.00	153.00	101.00	50.00	5511 19.050
19.160		20.00	153.00	101.00	50.00	5511 19.160
19.250		20.00	153.00	101.00	50.00	5511 19.250
19.300		20.00	153.00	101.00	50.00	5511 19.300
19.446		20.00	153.00	101.00	50.00	5511 19.446
19.500		20.00	153.00	101.00	50.00	5511 19.500
19.700		20.00	153.00	101.00	50.00	5511 19.700
19.840	25/32	20.00	153.00	101.00	50.00	5511 19.840
20.000		20.00	153.00	101.00	50.00	5511 20.000

Ratio drills with coolant ducts

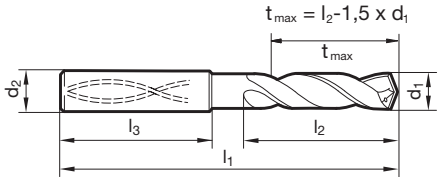
5xD | RT 100 XF | DIN 6537 L | 140° | m7 | 48 HRC

Tool material	Solid carbide
Surface	F
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • relieved cone • main cutting edge form concave • optimised cutting geometry • maximum performance • double margin
M	○	
K	○	
N		structural and case hardened steels • free-cutting steels, heat-treatable steels • steels (alloyed/unalloyed) up to 1400 N/mm²
S	○	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 296





Article no. **5498**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	66.00	28.00	36.00	5498 3.000
3.100		6.00	66.00	28.00	36.00	5498 3.100
3.170	1/8	6.00	66.00	28.00	36.00	5498 3.170
3.200		6.00	66.00	28.00	36.00	5498 3.200
3.250		6.00	66.00	28.00	36.00	5498 3.250
3.300		6.00	66.00	28.00	36.00	5498 3.300
3.400		6.00	66.00	28.00	36.00	5498 3.400
3.500		6.00	66.00	28.00	36.00	5498 3.500
3.570	9/64	6.00	66.00	28.00	36.00	5498 3.570
3.600		6.00	66.00	28.00	36.00	5498 3.600
3.700		6.00	66.00	28.00	36.00	5498 3.700
3.800		6.00	74.00	36.00	36.00	5498 3.800
3.900		6.00	74.00	36.00	36.00	5498 3.900
3.970	5/32	6.00	74.00	36.00	36.00	5498 3.970
4.000		6.00	74.00	36.00	36.00	5498 4.000
4.040		6.00	74.00	36.00	36.00	5498 4.040
4.100		6.00	74.00	36.00	36.00	5498 4.100
4.200		6.00	74.00	36.00	36.00	5498 4.200
4.300		6.00	74.00	36.00	36.00	5498 4.300
4.370	11/64	6.00	74.00	36.00	36.00	5498 4.370
4.400		6.00	74.00	36.00	36.00	5498 4.400
4.500		6.00	74.00	36.00	36.00	5498 4.500
4.600		6.00	74.00	36.00	36.00	5498 4.600
4.650		6.00	74.00	36.00	36.00	5498 4.650
4.700		6.00	74.00	36.00	36.00	5498 4.700
4.760	3/16	6.00	82.00	44.00	36.00	5498 4.760
4.800		6.00	82.00	44.00	36.00	5498 4.800
4.900		6.00	82.00	44.00	36.00	5498 4.900
5.000		6.00	82.00	44.00	36.00	5498 5.000
5.100		6.00	82.00	44.00	36.00	5498 5.100
5.110		6.00	82.00	44.00	36.00	5498 5.110
5.160	13/64	6.00	82.00	44.00	36.00	5498 5.160
5.200		6.00	82.00	44.00	36.00	5498 5.200
5.300		6.00	82.00	44.00	36.00	5498 5.300
5.400		6.00	82.00	44.00	36.00	5498 5.400
5.410		6.00	82.00	44.00	36.00	5498 5.410
5.500		6.00	82.00	44.00	36.00	5498 5.500
5.550		6.00	82.00	44.00	36.00	5498 5.550
5.560	7/32	6.00	82.00	44.00	36.00	5498 5.560
5.600		6.00	82.00	44.00	36.00	5498 5.600
5.700		6.00	82.00	44.00	36.00	5498 5.700
5.800		6.00	82.00	44.00	36.00	5498 5.800

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.900		6.00	82.00	44.00	36.00	5498 5.900
5.950	15/64	6.00	82.00	44.00	36.00	5498 5.950
6.000		6.00	82.00	44.00	36.00	5498 6.000
6.100		8.00	91.00	53.00	36.00	5498 6.100
6.200		8.00	91.00	53.00	36.00	5498 6.200
6.300		8.00	91.00	53.00	36.00	5498 6.300
6.350	1/4	8.00	91.00	53.00	36.00	5498 6.350
6.400		8.00	91.00	53.00	36.00	5498 6.400
6.500		8.00	91.00	53.00	36.00	5498 6.500
6.530		8.00	91.00	53.00	36.00	5498 6.530
6.550		8.00	91.00	53.00	36.00	5498 6.550
6.600		8.00	91.00	53.00	36.00	5498 6.600
6.700		8.00	91.00	53.00	36.00	5498 6.700
6.750	17/64	8.00	91.00	53.00	36.00	5498 6.750
6.800		8.00	91.00	53.00	36.00	5498 6.800
6.900		8.00	91.00	53.00	36.00	5498 6.900
7.000		8.00	91.00	53.00	36.00	5498 7.000
7.100		8.00	91.00	53.00	36.00	5498 7.100
7.140	9/32	8.00	91.00	53.00	36.00	5498 7.140
7.200		8.00	91.00	53.00	36.00	5498 7.200
7.300		8.00	91.00	53.00	36.00	5498 7.300
7.400		8.00	91.00	53.00	36.00	5498 7.400
7.500		8.00	91.00	53.00	36.00	5498 7.500
7.540	19/64	8.00	91.00	53.00	36.00	5498 7.540
7.550		8.00	91.00	53.00	36.00	5498 7.550
7.600		8.00	91.00	53.00	36.00	5498 7.600
7.650		8.00	91.00	53.00	36.00	5498 7.650
7.700		8.00	91.00	53.00	36.00	5498 7.700
7.800		8.00	91.00	53.00	36.00	5498 7.800
7.900		8.00	91.00	53.00	36.00	5498 7.900
7.940	5/16	8.00	91.00	53.00	36.00	5498 7.940
8.000		8.00	91.00	53.00	36.00	5498 8.000
8.100		10.00	103.00	61.00	40.00	5498 8.100
8.200		10.00	103.00	61.00	40.00	5498 8.200
8.300		10.00	103.00	61.00	40.00	5498 8.300
8.330	21/64	10.00	103.00	61.00	40.00	5498 8.330
8.400		10.00	103.00	61.00	40.00	5498 8.400
8.500		10.00	103.00	61.00	40.00	5498 8.500
8.600		10.00	103.00	61.00	40.00	5498 8.600
8.700		10.00	103.00	61.00	40.00	5498 8.700
8.730	11/32	10.00	103.00	61.00	40.00	5498 8.730
8.800		10.00	103.00	61.00	40.00	5498 8.800

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
8.900		10.00	103.00	61.00	40.00	5498 8.900
9.000		10.00	103.00	61.00	40.00	5498 9.000
9.100		10.00	103.00	61.00	40.00	5498 9.100
9.130	23/64	10.00	103.00	61.00	40.00	5498 9.130
9.200		10.00	103.00	61.00	40.00	5498 9.200
9.250		10.00	103.00	61.00	40.00	5498 9.250
9.300		10.00	103.00	61.00	40.00	5498 9.300
9.340		10.00	103.00	61.00	40.00	5498 9.340
9.400		10.00	103.00	61.00	40.00	5498 9.400
9.500		10.00	103.00	61.00	40.00	5498 9.500
9.520	3/8	10.00	103.00	61.00	40.00	5498 9.520
9.550		10.00	103.00	61.00	40.00	5498 9.550
9.600		10.00	103.00	61.00	40.00	5498 9.600
9.700		10.00	103.00	61.00	40.00	5498 9.700
9.800		10.00	103.00	61.00	40.00	5498 9.800
9.900		10.00	103.00	61.00	40.00	5498 9.900
9.920	25/64	10.00	103.00	61.00	40.00	5498 9.920
10.000		10.00	103.00	61.00	40.00	5498 10.000
10.100		12.00	118.00	71.00	45.00	5498 10.100
10.200		12.00	118.00	71.00	45.00	5498 10.200
10.300		12.00	118.00	71.00	45.00	5498 10.300
10.320	13/32	12.00	118.00	71.00	45.00	5498 10.320
10.400		12.00	118.00	71.00	45.00	5498 10.400
10.500		12.00	118.00	71.00	45.00	5498 10.500
10.600		12.00	118.00	71.00	45.00	5498 10.600
10.700		12.00	118.00	71.00	45.00	5498 10.700
10.720	27/64	12.00	118.00	71.00	45.00	5498 10.720
10.800		12.00	118.00	71.00	45.00	5498 10.800
10.900		12.00	118.00	71.00	45.00	5498 10.900
11.000		12.00	118.00	71.00	45.00	5498 11.000
11.100		12.00	118.00	71.00	45.00	5498 11.100
11.110	7/16	12.00	118.00	71.00	45.00	5498 11.110
11.200		12.00	118.00	71.00	45.00	5498 11.200
11.300		12.00	118.00	71.00	45.00	5498 11.300
11.400		12.00	118.00	71.00	45.00	5498 11.400
11.500		12.00	118.00	71.00	45.00	5498 11.500
11.510	29/64	12.00	118.00	71.00	45.00	5498 11.510
11.550		12.00	118.00	71.00	45.00	5498 11.550
11.600		12.00	118.00	71.00	45.00	5498 11.600
11.700		12.00	118.00	71.00	45.00	5498 11.700
11.800		12.00	118.00	71.00	45.00	5498 11.800
11.900		12.00	118.00	71.00	45.00	5498 11.900
11.910	15/32	12.00	118.00	71.00	45.00	5498 11.910
12.000		12.00	118.00	71.00	45.00	5498 12.000
12.100		14.00	124.00	77.00	45.00	5498 12.100
12.200		14.00	124.00	77.00	45.00	5498 12.200
12.300	31/64	14.00	124.00	77.00	45.00	5498 12.300
12.400		14.00	124.00	77.00	45.00	5498 12.400
12.500		14.00	124.00	77.00	45.00	5498 12.500
12.600		14.00	124.00	77.00	45.00	5498 12.600
12.700	1/2	14.00	124.00	77.00	45.00	5498 12.700
12.800		14.00	124.00	77.00	45.00	5498 12.800
12.900		14.00	124.00	77.00	45.00	5498 12.900
13.000		14.00	124.00	77.00	45.00	5498 13.000
13.100	33/64	14.00	124.00	77.00	45.00	5498 13.100
13.200		14.00	124.00	77.00	45.00	5498 13.200
13.300		14.00	124.00	77.00	45.00	5498 13.300
13.400		14.00	124.00	77.00	45.00	5498 13.400
13.490	17/32	14.00	124.00	77.00	45.00	5498 13.490
13.500		14.00	124.00	77.00	45.00	5498 13.500
13.600		14.00	124.00	77.00	45.00	5498 13.600
13.700		14.00	124.00	77.00	45.00	5498 13.700
13.800		14.00	124.00	77.00	45.00	5498 13.800
13.890	35/64	14.00	124.00	77.00	45.00	5498 13.890
13.900		14.00	124.00	77.00	45.00	5498 13.900
14.000		14.00	124.00	77.00	45.00	5498 14.000

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
14.100		16.00	133.00	83.00	48.00	5498 14.100
14.200		16.00	133.00	83.00	48.00	5498 14.200
14.290	9/16	16.00	133.00	83.00	48.00	5498 14.290
14.300		16.00	133.00	83.00	48.00	5498 14.300
14.400		16.00	133.00	83.00	48.00	5498 14.400
14.500		16.00	133.00	83.00	48.00	5498 14.500
14.600		16.00	133.00	83.00	48.00	5498 14.600
14.680	37/64	16.00	133.00	83.00	48.00	5498 14.680
14.700		16.00	133.00	83.00	48.00	5498 14.700
14.800		16.00	133.00	83.00	48.00	5498 14.800
14.900		16.00	133.00	83.00	48.00	5498 14.900
15.000		16.00	133.00	83.00	48.00	5498 15.000
15.080	19/32	16.00	133.00	83.00	48.00	5498 15.080
15.100		16.00	133.00	83.00	48.00	5498 15.100
15.200		16.00	133.00	83.00	48.00	5498 15.200
15.300		16.00	133.00	83.00	48.00	5498 15.300
15.400		16.00	133.00	83.00	48.00	5498 15.400
15.480	39/64	16.00	133.00	83.00	48.00	5498 15.480
15.500		16.00	133.00	83.00	48.00	5498 15.500
15.550		16.00	133.00	83.00	48.00	5498 15.550
15.600		16.00	133.00	83.00	48.00	5498 15.600
15.700		16.00	133.00	83.00	48.00	5498 15.700
15.800		16.00	133.00	83.00	48.00	5498 15.800
15.870	5/8	16.00	133.00	83.00	48.00	5498 15.870
15.900		16.00	133.00	83.00	48.00	5498 15.900
16.000		16.00	133.00	83.00	48.00	5498 16.000
16.270	41/64	18.00	143.00	93.00	48.00	5498 16.270
16.300		18.00	143.00	93.00	48.00	5498 16.300
16.500		18.00	143.00	93.00	48.00	5498 16.500
16.670	21/32	18.00	143.00	93.00	48.00	5498 16.670
16.700		18.00	143.00	93.00	48.00	5498 16.700
16.900		18.00	143.00	93.00	48.00	5498 16.900
17.000		18.00	143.00	93.00	48.00	5498 17.000
17.070	43/64	18.00	143.00	93.00	48.00	5498 17.070
17.460	11/16	18.00	143.00	93.00	48.00	5498 17.460
17.500		18.00	143.00	93.00	48.00	5498 17.500
17.550		18.00	143.00	93.00	48.00	5498 17.550
17.700		18.00	143.00	93.00	48.00	5498 17.700
17.860	45/64	18.00	143.00	93.00	48.00	5498 17.860
18.000		18.00	143.00	93.00	48.00	5498 18.000
18.260	23/32	20.00	153.00	101.00	50.00	5498 18.260
18.500		20.00	153.00	101.00	50.00	5498 18.500
18.700		20.00	153.00	101.00	50.00	5498 18.700
18.900		20.00	153.00	101.00	50.00	5498 18.900
19.000		20.00	153.00	101.00	50.00	5498 19.000
19.050	3/4	20.00	153.00	101.00	50.00	5498 19.050
19.250		20.00	153.00	101.00	50.00	5498 19.250
19.300		20.00	153.00	101.00	50.00	5498 19.300
19.450	49/64	20.00	153.00	101.00	50.00	5498 19.450
19.500		20.00	153.00	101.00	50.00	5498 19.500
19.550		20.00	153.00	101.00	50.00	5498 19.550
19.700		20.00	153.00	101.00	50.00	5498 19.700
19.800		20.00	153.00	101.00	50.00	5498 19.800
19.840	25/32	20.00	153.00	101.00	50.00	5498 19.840
20.000		20.00	153.00	101.00	50.00	5498 20.000

Ratio drills with coolant ducts

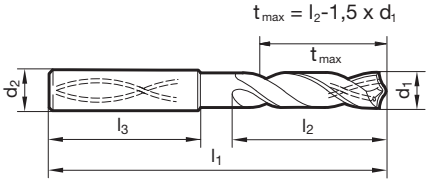
5xD | RT 100 HF | DIN 6537 L | 140° | m7 | 65 HRC

Tool material	Solid carbide
Surface	Y
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • relieved cone • main cutting edge is slightly concave • optimised cutting geometry • double margin
M		
K		
N		alloyed and high tensile steels up to 1600 N/mm² • Inconel, Hastelloy, Monel • Titanium and Titanium alloys
S	•	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 296





Article no. **8521**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	66.00	28.00	36.00	8521 3.000
3.100		6.00	66.00	28.00	36.00	8521 3.100
3.170	1/8	6.00	66.00	28.00	36.00	8521 3.170
3.200		6.00	66.00	28.00	36.00	8521 3.200
3.250		6.00	66.00	28.00	36.00	8521 3.250
3.300		6.00	66.00	28.00	36.00	8521 3.300
3.400		6.00	66.00	28.00	36.00	8521 3.400
3.500		6.00	66.00	28.00	36.00	8521 3.500
3.570	9/64	6.00	66.00	28.00	36.00	8521 3.570
3.600		6.00	66.00	28.00	36.00	8521 3.600
3.700		6.00	66.00	28.00	36.00	8521 3.700
3.800		6.00	74.00	36.00	36.00	8521 3.800
3.900		6.00	74.00	36.00	36.00	8521 3.900
3.970	5/32	6.00	74.00	36.00	36.00	8521 3.970
4.000		6.00	74.00	36.00	36.00	8521 4.000
4.100		6.00	74.00	36.00	36.00	8521 4.100
4.200		6.00	74.00	36.00	36.00	8521 4.200
4.300		6.00	74.00	36.00	36.00	8521 4.300
4.370	11/64	6.00	74.00	36.00	36.00	8521 4.370
4.400		6.00	74.00	36.00	36.00	8521 4.400
4.500		6.00	74.00	36.00	36.00	8521 4.500
4.600		6.00	74.00	36.00	36.00	8521 4.600
4.650		6.00	74.00	36.00	36.00	8521 4.650
4.700		6.00	74.00	36.00	36.00	8521 4.700
4.760	3/16	6.00	82.00	44.00	36.00	8521 4.760
4.800		6.00	82.00	44.00	36.00	8521 4.800
4.900		6.00	82.00	44.00	36.00	8521 4.900
5.000		6.00	82.00	44.00	36.00	8521 5.000
5.100		6.00	82.00	44.00	36.00	8521 5.100
5.160	13/64	6.00	82.00	44.00	36.00	8521 5.160
5.200		6.00	82.00	44.00	36.00	8521 5.200
5.300		6.00	82.00	44.00	36.00	8521 5.300
5.400		6.00	82.00	44.00	36.00	8521 5.400
5.500		6.00	82.00	44.00	36.00	8521 5.500
5.550		6.00	82.00	44.00	36.00	8521 5.550
5.560	7/32	6.00	82.00	44.00	36.00	8521 5.560
5.600		6.00	82.00	44.00	36.00	8521 5.600
5.700		6.00	82.00	44.00	36.00	8521 5.700
5.800		6.00	82.00	44.00	36.00	8521 5.800
5.900		6.00	82.00	44.00	36.00	8521 5.900
5.950	15/64	6.00	82.00	44.00	36.00	8521 5.950
6.000		6.00	82.00	44.00	36.00	8521 6.000

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
6.100		8.00	91.00	53.00	36.00	8521 6.100
6.200		8.00	91.00	53.00	36.00	8521 6.200
6.300		8.00	91.00	53.00	36.00	8521 6.300
6.350	1/4	8.00	91.00	53.00	36.00	8521 6.350
6.400		8.00	91.00	53.00	36.00	8521 6.400
6.500		8.00	91.00	53.00	36.00	8521 6.500
6.600		8.00	91.00	53.00	36.00	8521 6.600
6.700		8.00	91.00	53.00	36.00	8521 6.700
6.750	17/64	8.00	91.00	53.00	36.00	8521 6.750
6.800		8.00	91.00	53.00	36.00	8521 6.800
6.900		8.00	91.00	53.00	36.00	8521 6.900
7.000		8.00	91.00	53.00	36.00	8521 7.000
7.100		8.00	91.00	53.00	36.00	8521 7.100
7.140	9/32	8.00	91.00	53.00	36.00	8521 7.140
7.200		8.00	91.00	53.00	36.00	8521 7.200
7.300		8.00	91.00	53.00	36.00	8521 7.300
7.400		8.00	91.00	53.00	36.00	8521 7.400
7.500		8.00	91.00	53.00	36.00	8521 7.500
7.540	19/64	8.00	91.00	53.00	36.00	8521 7.540
7.600		8.00	91.00	53.00	36.00	8521 7.600
7.700		8.00	91.00	53.00	36.00	8521 7.700
7.800		8.00	91.00	53.00	36.00	8521 7.800
7.900		8.00	91.00	53.00	36.00	8521 7.900
7.940	5/16	8.00	91.00	53.00	36.00	8521 7.940
8.000		8.00	91.00	53.00	36.00	8521 8.000
8.100		10.00	103.00	61.00	40.00	8521 8.100
8.200		10.00	103.00	61.00	40.00	8521 8.200
8.300		10.00	103.00	61.00	40.00	8521 8.300
8.330	21/64	10.00	103.00	61.00	40.00	8521 8.330
8.400		10.00	103.00	61.00	40.00	8521 8.400
8.500		10.00	103.00	61.00	40.00	8521 8.500
8.600		10.00	103.00	61.00	40.00	8521 8.600
8.700		10.00	103.00	61.00	40.00	8521 8.700
8.730	11/32	10.00	103.00	61.00	40.00	8521 8.730
8.800		10.00	103.00	61.00	40.00	8521 8.800
8.900		10.00	103.00	61.00	40.00	8521 8.900
9.000		10.00	103.00	61.00	40.00	8521 9.000
9.100		10.00	103.00	61.00	40.00	8521 9.100
9.130	23/64	10.00	103.00	61.00	40.00	8521 9.130
9.200		10.00	103.00	61.00	40.00	8521 9.200
9.250		10.00	103.00	61.00	40.00	8521 9.250
9.300		10.00	103.00	61.00	40.00	8521 9.300

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
9.400		10.00	103.00	61.00	40.00	8521 9.400
9.500		10.00	103.00	61.00	40.00	8521 9.500
9.520	3/8	10.00	103.00	61.00	40.00	8521 9.520
9.600		10.00	103.00	61.00	40.00	8521 9.600
9.700		10.00	103.00	61.00	40.00	8521 9.700
9.800		10.00	103.00	61.00	40.00	8521 9.800
9.900		10.00	103.00	61.00	40.00	8521 9.900
9.920	25/64	10.00	103.00	61.00	40.00	8521 9.920
10.000		10.00	103.00	61.00	40.00	8521 10.000
10.100		12.00	118.00	71.00	45.00	8521 10.100
10.200		12.00	118.00	71.00	45.00	8521 10.200
10.300		12.00	118.00	71.00	45.00	8521 10.300
10.320	13/32	12.00	118.00	71.00	45.00	8521 10.320
10.400		12.00	118.00	71.00	45.00	8521 10.400
10.500		12.00	118.00	71.00	45.00	8521 10.500
10.600		12.00	118.00	71.00	45.00	8521 10.600
10.700		12.00	118.00	71.00	45.00	8521 10.700
10.720	27/64	12.00	118.00	71.00	45.00	8521 10.720
10.800		12.00	118.00	71.00	45.00	8521 10.800
10.900		12.00	118.00	71.00	45.00	8521 10.900
11.000		12.00	118.00	71.00	45.00	8521 11.000
11.100		12.00	118.00	71.00	45.00	8521 11.100
11.110	7/16	12.00	118.00	71.00	45.00	8521 11.110
11.200		12.00	118.00	71.00	45.00	8521 11.200
11.300		12.00	118.00	71.00	45.00	8521 11.300
11.400		12.00	118.00	71.00	45.00	8521 11.400
11.500		12.00	118.00	71.00	45.00	8521 11.500
11.510	29/64	12.00	118.00	71.00	45.00	8521 11.510
11.600		12.00	118.00	71.00	45.00	8521 11.600
11.700		12.00	118.00	71.00	45.00	8521 11.700
11.800		12.00	118.00	71.00	45.00	8521 11.800
11.900		12.00	118.00	71.00	45.00	8521 11.900
11.910	15/32	12.00	118.00	71.00	45.00	8521 11.910
12.000		12.00	118.00	71.00	45.00	8521 12.000
12.200		14.00	124.00	77.00	45.00	8521 12.200
12.300	31/64	14.00	124.00	77.00	45.00	8521 12.300

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
12.500		14.00	124.00	77.00	45.00	8521 12.500
12.700	1/2	14.00	124.00	77.00	45.00	8521 12.700
12.800		14.00	124.00	77.00	45.00	8521 12.800
13.000		14.00	124.00	77.00	45.00	8521 13.000
13.300		14.00	124.00	77.00	45.00	8521 13.300
13.490	17/32	14.00	124.00	77.00	45.00	8521 13.490
13.500		14.00	124.00	77.00	45.00	8521 13.500
13.700		14.00	124.00	77.00	45.00	8521 13.700
14.000		14.00	124.00	77.00	45.00	8521 14.000
14.200		16.00	133.00	83.00	48.00	8521 14.200
14.290	9/16	16.00	133.00	83.00	48.00	8521 14.290
14.300		16.00	133.00	83.00	48.00	8521 14.300
14.500		16.00	133.00	83.00	48.00	8521 14.500
14.700		16.00	133.00	83.00	48.00	8521 14.700
15.000		16.00	133.00	83.00	48.00	8521 15.000
15.200		16.00	133.00	83.00	48.00	8521 15.200
15.300		16.00	133.00	83.00	48.00	8521 15.300
15.500		16.00	133.00	83.00	48.00	8521 15.500
15.700		16.00	133.00	83.00	48.00	8521 15.700
15.870	5/8	16.00	133.00	83.00	48.00	8521 15.870
16.000		16.00	133.00	83.00	48.00	8521 16.000
16.300		18.00	143.00	93.00	48.00	8521 16.300
16.500		18.00	143.00	93.00	48.00	8521 16.500
16.900		18.00	143.00	93.00	48.00	8521 16.900
17.000		18.00	143.00	93.00	48.00	8521 17.000
17.300		18.00	143.00	93.00	48.00	8521 17.300
17.500		18.00	143.00	93.00	48.00	8521 17.500
18.000		18.00	143.00	93.00	48.00	8521 18.000
18.500		20.00	153.00	101.00	50.00	8521 18.500
18.900		20.00	153.00	101.00	50.00	8521 18.900
19.000		20.00	153.00	101.00	50.00	8521 19.000
19.050	3/4	20.00	153.00	101.00	50.00	8521 19.050
19.300		20.00	153.00	101.00	50.00	8521 19.300
19.500		20.00	153.00	101.00	50.00	8521 19.500
20.000		20.00	153.00	101.00	50.00	8521 20.000

Ratio drills with coolant ducts

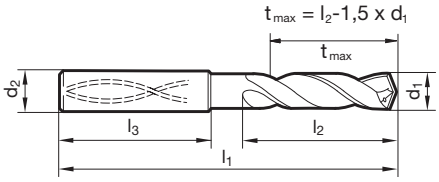
7xD | RT 100 U | WN | 140° | m7 | 48 HRC

Tool material	Solid carbide
Surface	F
Shank form	HA

P •	web thinning ≥ Ø 3.000 • facet point grind • main cutting edge form straight • optimised cutting geometry
M ○	
K •	
N ○	structural and case hardened steels • free-cutting steels, heat-treatable steels • steels (alloyed/unalloyed) up to 1200 N/mm² • cast materials
S ○	• bronze, brass • high-alloyed AlSi alloys
H ○	

GÜHRINGNAVIGATOR

Cutting data page 298





Article no. **5512**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	70.00	30.00	36.00	5512 3.000
3.100		6.00	70.00	30.00	36.00	5512 3.100
3.170	1/8	6.00	70.00	30.00	36.00	5512 3.170
3.200		6.00	70.00	30.00	36.00	5512 3.200
3.250		6.00	70.00	30.00	36.00	5512 3.250
3.300		6.00	70.00	30.00	36.00	5512 3.300
3.400		6.00	75.00	35.50	36.00	5512 3.400
3.500		6.00	75.00	35.50	36.00	5512 3.500
3.570	9/64	6.00	75.00	35.50	36.00	5512 3.570
3.600		6.00	75.00	35.50	36.00	5512 3.600
3.700		6.00	75.00	35.50	36.00	5512 3.700
3.800		6.00	75.00	37.50	36.00	5512 3.800
3.900		6.00	75.00	37.50	36.00	5512 3.900
3.970	5/32	6.00	75.00	37.50	36.00	5512 3.970
4.000		6.00	75.00	37.50	36.00	5512 4.000
4.040		6.00	75.00	37.50	36.00	5512 4.040
4.100		6.00	75.00	37.50	36.00	5512 4.100
4.200		6.00	75.00	37.50	36.00	5512 4.200
4.300		6.00	85.00	45.00	36.00	5512 4.300
4.370	11/64	6.00	85.00	45.00	36.00	5512 4.370
4.400		6.00	85.00	45.00	36.00	5512 4.400
4.500		6.00	85.00	45.00	36.00	5512 4.500
4.600		6.00	85.00	45.00	36.00	5512 4.600
4.650		6.00	85.00	45.00	36.00	5512 4.650
4.700		6.00	85.00	45.00	36.00	5512 4.700
4.760	3/16	6.00	90.00	50.00	36.00	5512 4.760
4.800		6.00	90.00	50.00	36.00	5512 4.800
4.900		6.00	90.00	50.00	36.00	5512 4.900
5.000		6.00	90.00	50.00	36.00	5512 5.000
5.100		6.00	90.00	50.00	36.00	5512 5.100
5.110		6.00	90.00	50.00	36.00	5512 5.110
5.160	13/64	6.00	90.00	50.00	36.00	5512 5.160
5.200		6.00	90.00	50.00	36.00	5512 5.200
5.250		6.00	90.00	50.00	36.00	5512 5.250
5.300		6.00	90.00	50.00	36.00	5512 5.300
5.400		6.00	97.00	57.00	36.00	5512 5.400
5.410		6.00	97.00	57.00	36.00	5512 5.410
5.500		6.00	97.00	57.00	36.00	5512 5.500
5.560	7/32	6.00	97.00	57.00	36.00	5512 5.560
5.600		6.00	97.00	57.00	36.00	5512 5.600
5.700		6.00	97.00	57.00	36.00	5512 5.700
5.800		6.00	97.00	57.00	36.00	5512 5.800

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.900		6.00	97.00	57.00	36.00	5512 5.900
5.950	15/64	6.00	97.00	57.00	36.00	5512 5.950
6.000		6.00	97.00	57.00	36.00	5512 6.000
6.100		8.00	106.00	66.00	36.00	5512 6.100
6.200		8.00	106.00	66.00	36.00	5512 6.200
6.300		8.00	106.00	66.00	36.00	5512 6.300
6.350	1/4	8.00	106.00	66.00	36.00	5512 6.350
6.400		8.00	106.00	66.00	36.00	5512 6.400
6.500		8.00	106.00	66.00	36.00	5512 6.500
6.530		8.00	106.00	66.00	36.00	5512 6.530
6.600		8.00	106.00	66.00	36.00	5512 6.600
6.700		8.00	106.00	66.00	36.00	5512 6.700
6.750	17/64	8.00	106.00	66.00	36.00	5512 6.750
6.800		8.00	106.00	66.00	36.00	5512 6.800
6.900		8.00	116.00	76.00	36.00	5512 6.900
7.000		8.00	116.00	76.00	36.00	5512 7.000
7.100		8.00	116.00	76.00	36.00	5512 7.100
7.140	9/32	8.00	116.00	76.00	36.00	5512 7.140
7.200		8.00	116.00	76.00	36.00	5512 7.200
7.300		8.00	116.00	76.00	36.00	5512 7.300
7.400		8.00	116.00	76.00	36.00	5512 7.400
7.500		8.00	116.00	76.00	36.00	5512 7.500
7.540	19/64	8.00	116.00	76.00	36.00	5512 7.540
7.600		8.00	116.00	76.00	36.00	5512 7.600
7.700		8.00	116.00	76.00	36.00	5512 7.700
7.800		8.00	116.00	76.00	36.00	5512 7.800
7.900		8.00	116.00	76.00	36.00	5512 7.900
7.940	5/16	8.00	116.00	76.00	36.00	5512 7.940
8.000		8.00	116.00	76.00	36.00	5512 8.000
8.100		10.00	131.00	87.00	40.00	5512 8.100
8.200		10.00	131.00	87.00	40.00	5512 8.200
8.300		10.00	131.00	87.00	40.00	5512 8.300
8.330	21/64	10.00	131.00	87.00	40.00	5512 8.330
8.400		10.00	131.00	87.00	40.00	5512 8.400
8.500		10.00	131.00	87.00	40.00	5512 8.500
8.600		10.00	131.00	87.00	40.00	5512 8.600
8.700		10.00	131.00	87.00	40.00	5512 8.700
8.730	11/32	10.00	131.00	87.00	40.00	5512 8.730
8.800		10.00	131.00	87.00	40.00	5512 8.800
8.900		10.00	131.00	87.00	40.00	5512 8.900
9.000		10.00	131.00	87.00	40.00	5512 9.000
9.100		10.00	139.00	95.00	40.00	5512 9.100

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
9.130	23/64	10.00	139.00	95.00	40.00	5512 9.130
9.200		10.00	139.00	95.00	40.00	5512 9.200
9.250		10.00	139.00	95.00	40.00	5512 9.250
9.300		10.00	139.00	95.00	40.00	5512 9.300
9.340		10.00	139.00	95.00	40.00	5512 9.340
9.400		10.00	139.00	95.00	40.00	5512 9.400
9.500		10.00	139.00	95.00	40.00	5512 9.500
9.520	3/8	10.00	139.00	95.00	40.00	5512 9.520
9.600		10.00	139.00	95.00	40.00	5512 9.600
9.700		10.00	139.00	95.00	40.00	5512 9.700
9.800		10.00	139.00	95.00	40.00	5512 9.800
9.900		10.00	139.00	95.00	40.00	5512 9.900
9.920	25/64	10.00	139.00	95.00	40.00	5512 9.920
10.000		10.00	139.00	95.00	40.00	5512 10.000
10.100		12.00	155.00	106.00	45.00	5512 10.100
10.200		12.00	155.00	106.00	45.00	5512 10.200
10.300		12.00	155.00	106.00	45.00	5512 10.300
10.320	13/32	12.00	155.00	106.00	45.00	5512 10.320
10.400		12.00	155.00	106.00	45.00	5512 10.400
10.500		12.00	155.00	106.00	45.00	5512 10.500
10.600		12.00	155.00	106.00	45.00	5512 10.600
10.700		12.00	155.00	106.00	45.00	5512 10.700
10.720	27/64	12.00	155.00	106.00	45.00	5512 10.720
10.800		12.00	155.00	106.00	45.00	5512 10.800
10.900		12.00	155.00	106.00	45.00	5512 10.900
11.000		12.00	155.00	106.00	45.00	5512 11.000
11.100		12.00	163.00	114.00	45.00	5512 11.100
11.110	7/16	12.00	163.00	114.00	45.00	5512 11.110
11.200		12.00	163.00	114.00	45.00	5512 11.200
11.300		12.00	163.00	114.00	45.00	5512 11.300
11.400		12.00	163.00	114.00	45.00	5512 11.400
11.500		12.00	163.00	114.00	45.00	5512 11.500
11.510	29/64	12.00	163.00	114.00	45.00	5512 11.510
11.600		12.00	163.00	114.00	45.00	5512 11.600
11.700		12.00	163.00	114.00	45.00	5512 11.700
11.800		12.00	163.00	114.00	45.00	5512 11.800

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
11.900		12.00	163.00	114.00	45.00	5512 11.900
11.910	15/32	12.00	163.00	114.00	45.00	5512 11.910
12.000		12.00	163.00	114.00	45.00	5512 12.000
12.100		14.00	182.00	133.00	45.00	5512 12.100
12.200		14.00	182.00	133.00	45.00	5512 12.200
12.300	31/64	14.00	182.00	133.00	45.00	5512 12.300
12.500		14.00	182.00	133.00	45.00	5512 12.500
12.700	1/2	14.00	182.00	133.00	45.00	5512 12.700
13.000		14.00	182.00	133.00	45.00	5512 13.000
13.100	33/64	14.00	182.00	133.00	45.00	5512 13.100
13.490	17/32	14.00	182.00	133.00	45.00	5512 13.490
13.500		14.00	182.00	133.00	45.00	5512 13.500
13.890	35/64	14.00	182.00	133.00	45.00	5512 13.890
14.000		14.00	182.00	133.00	45.00	5512 14.000
14.100		16.00	204.00	152.00	48.00	5512 14.100
14.200		16.00	204.00	152.00	48.00	5512 14.200
14.290	9/16	16.00	204.00	152.00	48.00	5512 14.290
14.500		16.00	204.00	152.00	48.00	5512 14.500
15.000		16.00	204.00	152.00	48.00	5512 15.000
15.100		16.00	204.00	152.00	48.00	5512 15.100
15.480	39/64	16.00	204.00	152.00	48.00	5512 15.480
15.500		16.00	204.00	152.00	48.00	5512 15.500
15.870	5/8	16.00	204.00	152.00	48.00	5512 15.870
16.000		16.00	204.00	152.00	48.00	5512 16.000
16.500		18.00	223.00	171.00	48.00	5512 16.500
16.670	21/32	18.00	223.00	171.00	48.00	5512 16.670
16.900		18.00	223.00	171.00	48.00	5512 16.900
17.000		18.00	223.00	171.00	48.00	5512 17.000
17.500		18.00	223.00	171.00	48.00	5512 17.500
18.000		18.00	223.00	171.00	48.00	5512 18.000
18.500		20.00	244.00	190.00	50.00	5512 18.500
18.900		20.00	244.00	190.00	50.00	5512 18.900
19.000		20.00	244.00	190.00	50.00	5512 19.000
19.050	3/4	20.00	244.00	190.00	50.00	5512 19.050
19.500		20.00	244.00	190.00	50.00	5512 19.500
20.000		20.00	244.00	190.00	50.00	5512 20.000

Ratio drills with coolant ducts

7xD | RT 100 XF | WN | 140° | m7 | 48 HRC

Tool material	Solid carbide
Surface	F
Shank form	HA

P	•
M	○
K	○
N	
S	○
H	○

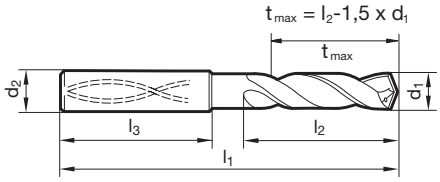
web thinning ≥ Ø 3.000 • relieved cone • main cutting edge form concave • optimised cutting geometry • maximum performance • double margin

structural and case hardened steels • free-cutting steels, heat-treatable steels • steels (alloyed/unalloyed) up to 1400 N/mm²

GÜHRINGNAVIGATOR

Cutting data page 298





Article no. **5499**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	70.00	30.00	36.00	5499 3.000
3.100		6.00	70.00	30.00	36.00	5499 3.100
3.170	1/8	6.00	70.00	30.00	36.00	5499 3.170
3.200		6.00	70.00	30.00	36.00	5499 3.200
3.250		6.00	70.00	30.00	36.00	5499 3.250
3.300		6.00	70.00	30.00	36.00	5499 3.300
3.400		6.00	75.00	35.50	36.00	5499 3.400
3.500		6.00	75.00	35.50	36.00	5499 3.500
3.570	9/64	6.00	75.00	35.50	36.00	5499 3.570
3.600		6.00	75.00	35.50	36.00	5499 3.600
3.700		6.00	75.00	35.50	36.00	5499 3.700
3.800		6.00	75.00	37.50	36.00	5499 3.800
3.900		6.00	75.00	37.50	36.00	5499 3.900
3.970	5/32	6.00	75.00	37.50	36.00	5499 3.970
4.000		6.00	75.00	37.50	36.00	5499 4.000
4.040		6.00	75.00	37.50	36.00	5499 4.040
4.100		6.00	75.00	37.50	36.00	5499 4.100
4.200		6.00	75.00	37.50	36.00	5499 4.200
4.300		6.00	85.00	45.00	36.00	5499 4.300
4.370	11/64	6.00	85.00	45.00	36.00	5499 4.370
4.400		6.00	85.00	45.00	36.00	5499 4.400
4.500		6.00	85.00	45.00	36.00	5499 4.500
4.600		6.00	85.00	45.00	36.00	5499 4.600
4.650		6.00	85.00	45.00	36.00	5499 4.650
4.700		6.00	85.00	45.00	36.00	5499 4.700
4.760	3/16	6.00	90.00	50.00	36.00	5499 4.760
4.800		6.00	90.00	50.00	36.00	5499 4.800
4.900		6.00	90.00	50.00	36.00	5499 4.900
5.000		6.00	90.00	50.00	36.00	5499 5.000
5.100		6.00	90.00	50.00	36.00	5499 5.100
5.110		6.00	90.00	50.00	36.00	5499 5.110
5.160	13/64	6.00	90.00	50.00	36.00	5499 5.160
5.200		6.00	90.00	50.00	36.00	5499 5.200
5.300		6.00	90.00	50.00	36.00	5499 5.300
5.400		6.00	97.00	57.00	36.00	5499 5.400
5.410		6.00	97.00	57.00	36.00	5499 5.410
5.500		6.00	97.00	57.00	36.00	5499 5.500
5.550		6.00	97.00	57.00	36.00	5499 5.550
5.560	7/32	6.00	97.00	57.00	36.00	5499 5.560
5.600		6.00	97.00	57.00	36.00	5499 5.600
5.700		6.00	97.00	57.00	36.00	5499 5.700
5.800		6.00	97.00	57.00	36.00	5499 5.800

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.900		6.00	97.00	57.00	36.00	5499 5.900
5.950	15/64	6.00	97.00	57.00	36.00	5499 5.950
6.000		6.00	97.00	57.00	36.00	5499 6.000
6.100		8.00	106.00	66.00	36.00	5499 6.100
6.200		8.00	106.00	66.00	36.00	5499 6.200
6.300		8.00	106.00	66.00	36.00	5499 6.300
6.350	1/4	8.00	106.00	66.00	36.00	5499 6.350
6.400		8.00	106.00	66.00	36.00	5499 6.400
6.500		8.00	106.00	66.00	36.00	5499 6.500
6.530		8.00	106.00	66.00	36.00	5499 6.530
6.550		8.00	106.00	66.00	36.00	5499 6.550
6.600		8.00	106.00	66.00	36.00	5499 6.600
6.700		8.00	106.00	66.00	36.00	5499 6.700
6.750	17/64	8.00	106.00	66.00	36.00	5499 6.750
6.800		8.00	106.00	66.00	36.00	5499 6.800
6.900		8.00	116.00	76.00	36.00	5499 6.900
7.000		8.00	116.00	76.00	36.00	5499 7.000
7.100		8.00	116.00	76.00	36.00	5499 7.100
7.140	9/32	8.00	116.00	76.00	36.00	5499 7.140
7.200		8.00	116.00	76.00	36.00	5499 7.200
7.300		8.00	116.00	76.00	36.00	5499 7.300
7.400		8.00	116.00	76.00	36.00	5499 7.400
7.500		8.00	116.00	76.00	36.00	5499 7.500
7.540	19/64	8.00	116.00	76.00	36.00	5499 7.540
7.600		8.00	116.00	76.00	36.00	5499 7.600
7.700		8.00	116.00	76.00	36.00	5499 7.700
7.800		8.00	116.00	76.00	36.00	5499 7.800
7.900		8.00	116.00	76.00	36.00	5499 7.900
7.940	5/16	8.00	116.00	76.00	36.00	5499 7.940
8.000		8.00	116.00	76.00	36.00	5499 8.000
8.100		10.00	131.00	87.00	40.00	5499 8.100
8.200		10.00	131.00	87.00	40.00	5499 8.200
8.300		10.00	131.00	87.00	40.00	5499 8.300
8.330	21/64	10.00	131.00	87.00	40.00	5499 8.330
8.400		10.00	131.00	87.00	40.00	5499 8.400
8.500		10.00	131.00	87.00	40.00	5499 8.500
8.600		10.00	131.00	87.00	40.00	5499 8.600
8.700		10.00	131.00	87.00	40.00	5499 8.700
8.730	11/32	10.00	131.00	87.00	40.00	5499 8.730
8.800		10.00	131.00	87.00	40.00	5499 8.800
8.900		10.00	131.00	87.00	40.00	5499 8.900
9.000		10.00	131.00	87.00	40.00	5499 9.000

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
9.100		10.00	139.00	95.00	40.00	5499 9.100
9.130	23/64	10.00	139.00	95.00	40.00	5499 9.130
9.200		10.00	139.00	95.00	40.00	5499 9.200
9.250		10.00	139.00	95.00	40.00	5499 9.250
9.300		10.00	139.00	95.00	40.00	5499 9.300
9.340		10.00	139.00	95.00	40.00	5499 9.340
9.400		10.00	139.00	95.00	40.00	5499 9.400
9.500		10.00	139.00	95.00	40.00	5499 9.500
9.520	3/8	10.00	139.00	95.00	40.00	5499 9.520
9.600		10.00	139.00	95.00	40.00	5499 9.600
9.700		10.00	139.00	95.00	40.00	5499 9.700
9.800		10.00	139.00	95.00	40.00	5499 9.800
9.900		10.00	139.00	95.00	40.00	5499 9.900
9.920	25/64	10.00	139.00	95.00	40.00	5499 9.920
10.000		10.00	139.00	95.00	40.00	5499 10.000
10.100		12.00	155.00	106.00	45.00	5499 10.100
10.200		12.00	155.00	106.00	45.00	5499 10.200
10.300		12.00	155.00	106.00	45.00	5499 10.300
10.320	13/32	12.00	155.00	106.00	45.00	5499 10.320
10.400		12.00	155.00	106.00	45.00	5499 10.400
10.500		12.00	155.00	106.00	45.00	5499 10.500
10.600		12.00	155.00	106.00	45.00	5499 10.600
10.700		12.00	155.00	106.00	45.00	5499 10.700
10.720	27/64	12.00	155.00	106.00	45.00	5499 10.720
10.800		12.00	155.00	106.00	45.00	5499 10.800
10.900		12.00	155.00	106.00	45.00	5499 10.900
11.000		12.00	155.00	106.00	45.00	5499 11.000
11.100		12.00	163.00	114.00	45.00	5499 11.100
11.110	7/16	12.00	163.00	114.00	45.00	5499 11.110
11.200		12.00	163.00	114.00	45.00	5499 11.200
11.300		12.00	163.00	114.00	45.00	5499 11.300
11.400		12.00	163.00	114.00	45.00	5499 11.400
11.500		12.00	163.00	114.00	45.00	5499 11.500
11.510	29/64	12.00	163.00	114.00	45.00	5499 11.510
11.600		12.00	163.00	114.00	45.00	5499 11.600
11.700		12.00	163.00	114.00	45.00	5499 11.700
11.800		12.00	163.00	114.00	45.00	5499 11.800
11.900		12.00	163.00	114.00	45.00	5499 11.900
11.910	15/32	12.00	163.00	114.00	45.00	5499 11.910
12.000		12.00	163.00	114.00	45.00	5499 12.000
12.100		14.00	182.00	133.00	45.00	5499 12.100
12.200		14.00	182.00	133.00	45.00	5499 12.200
12.300	31/64	14.00	182.00	133.00	45.00	5499 12.300
12.400		14.00	182.00	133.00	45.00	5499 12.400
12.500		14.00	182.00	133.00	45.00	5499 12.500
12.600		14.00	182.00	133.00	45.00	5499 12.600
12.700	1/2	14.00	182.00	133.00	45.00	5499 12.700
12.800		14.00	182.00	133.00	45.00	5499 12.800

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
12.900		14.00	182.00	133.00	45.00	5499 12.900
13.000		14.00	182.00	133.00	45.00	5499 13.000
13.100	33/64	14.00	182.00	133.00	45.00	5499 13.100
13.490	17/32	14.00	182.00	133.00	45.00	5499 13.490
13.500		14.00	182.00	133.00	45.00	5499 13.500
13.700		14.00	182.00	133.00	45.00	5499 13.700
13.890	35/64	14.00	182.00	133.00	45.00	5499 13.890
14.000		14.00	182.00	133.00	45.00	5499 14.000
14.100		16.00	204.00	152.00	48.00	5499 14.100
14.200		16.00	204.00	152.00	48.00	5499 14.200
14.290	9/16	16.00	204.00	152.00	48.00	5499 14.290
14.300		16.00	204.00	152.00	48.00	5499 14.300
14.500		16.00	204.00	152.00	48.00	5499 14.500
14.700		16.00	204.00	152.00	48.00	5499 14.700
14.800		16.00	204.00	152.00	48.00	5499 14.800
15.000		16.00	204.00	152.00	48.00	5499 15.000
15.100		16.00	204.00	152.00	48.00	5499 15.100
15.300		16.00	204.00	152.00	48.00	5499 15.300
15.480	39/64	16.00	204.00	152.00	48.00	5499 15.480
15.500		16.00	204.00	152.00	48.00	5499 15.500
15.700		16.00	204.00	152.00	48.00	5499 15.700
15.800		16.00	204.00	152.00	48.00	5499 15.800
15.870	5/8	16.00	204.00	152.00	48.00	5499 15.870
16.000		16.00	204.00	152.00	48.00	5499 16.000
16.300		18.00	223.00	171.00	48.00	5499 16.300
16.500		18.00	223.00	171.00	48.00	5499 16.500
16.700		18.00	223.00	171.00	48.00	5499 16.700
16.900		18.00	223.00	171.00	48.00	5499 16.900
17.000		18.00	223.00	171.00	48.00	5499 17.000
17.500		18.00	223.00	171.00	48.00	5499 17.500
17.700		18.00	223.00	171.00	48.00	5499 17.700
18.000		18.00	223.00	171.00	48.00	5499 18.000
18.500		20.00	244.00	190.00	50.00	5499 18.500
18.900		20.00	244.00	190.00	50.00	5499 18.900
19.000		20.00	244.00	190.00	50.00	5499 19.000
19.050	3/4	20.00	244.00	190.00	50.00	5499 19.050
19.500		20.00	244.00	190.00	50.00	5499 19.500
19.800		20.00	244.00	190.00	50.00	5499 19.800
20.000		20.00	244.00	190.00	50.00	5499 20.000

Ratio drills with coolant ducts

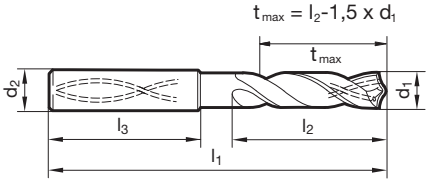
7xD | RT 100 HF | WN | 140° | m7 | 65 HRC

Tool material	Solid carbide
Surface	Y
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • relieved cone • main cutting edge is slightly concave • optimised cutting geometry • double margin
M		
K		
N		alloyed and high tensile steels up to 1600 N/mm² • Inconel, Hastelloy, Monel • Titanium and Titanium alloys
S	•	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 298





Article no. **8522**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	70.00	30.00	36.00	8522 3.000
3.170	1/8	6.00	70.00	30.00	36.00	8522 3.170
3.250		6.00	70.00	30.00	36.00	8522 3.250
3.300		6.00	70.00	30.00	36.00	8522 3.300
3.400		6.00	75.00	35.50	36.00	8522 3.400
3.500		6.00	75.00	35.50	36.00	8522 3.500
3.570	9/64	6.00	75.00	35.50	36.00	8522 3.570
3.700		6.00	75.00	35.50	36.00	8522 3.700
3.970	5/32	6.00	75.00	37.50	36.00	8522 3.970
4.000		6.00	75.00	37.50	36.00	8522 4.000
4.200		6.00	75.00	37.50	36.00	8522 4.200
4.300		6.00	85.00	45.00	36.00	8522 4.300
4.370	11/64	6.00	85.00	45.00	36.00	8522 4.370
4.500		6.00	85.00	45.00	36.00	8522 4.500
4.650		6.00	85.00	45.00	36.00	8522 4.650
4.760	3/16	6.00	90.00	50.00	36.00	8522 4.760
5.000		6.00	90.00	50.00	36.00	8522 5.000
5.100		6.00	90.00	50.00	36.00	8522 5.100
5.160	13/64	6.00	90.00	50.00	36.00	8522 5.160
5.200		6.00	90.00	50.00	36.00	8522 5.200
5.500		6.00	97.00	57.00	36.00	8522 5.500
5.550		6.00	97.00	57.00	36.00	8522 5.550
5.560	7/32	6.00	97.00	57.00	36.00	8522 5.560
5.950	15/64	6.00	97.00	57.00	36.00	8522 5.950
6.000		6.00	97.00	57.00	36.00	8522 6.000
6.350	1/4	8.00	106.00	66.00	36.00	8522 6.350
6.500		8.00	106.00	66.00	36.00	8522 6.500
6.530		8.00	106.00	66.00	36.00	8522 6.530
6.750	17/64	8.00	106.00	66.00	36.00	8522 6.750
6.800		8.00	106.00	66.00	36.00	8522 6.800
6.900		8.00	116.00	76.00	36.00	8522 6.900
7.000		8.00	116.00	76.00	36.00	8522 7.000
7.140	9/32	8.00	116.00	76.00	36.00	8522 7.140
7.400		8.00	116.00	76.00	36.00	8522 7.400
7.500		8.00	116.00	76.00	36.00	8522 7.500
7.540	19/64	8.00	116.00	76.00	36.00	8522 7.540
7.800		8.00	116.00	76.00	36.00	8522 7.800
7.940	5/16	8.00	116.00	76.00	36.00	8522 7.940
8.000		8.00	116.00	76.00	36.00	8522 8.000
8.330	21/64	10.00	131.00	87.00	40.00	8522 8.330
8.500		10.00	131.00	87.00	40.00	8522 8.500
8.600		10.00	131.00	87.00	40.00	8522 8.600
8.730	11/32	10.00	131.00	87.00	40.00	8522 8.730
8.800		10.00	131.00	87.00	40.00	8522 8.800
9.000		10.00	131.00	87.00	40.00	8522 9.000
9.130	23/64	10.00	139.00	95.00	40.00	8522 9.130
9.250		10.00	139.00	95.00	40.00	8522 9.250
9.340		10.00	139.00	95.00	40.00	8522 9.340
9.400		10.00	139.00	95.00	40.00	8522 9.400
9.500		10.00	139.00	95.00	40.00	8522 9.500
9.520	3/8	10.00	139.00	95.00	40.00	8522 9.520
9.920	25/64	10.00	139.00	95.00	40.00	8522 9.920
10.000		10.00	139.00	95.00	40.00	8522 10.000
10.200		12.00	155.00	106.00	45.00	8522 10.200
10.320	13/32	12.00	155.00	106.00	45.00	8522 10.320
10.400		12.00	155.00	106.00	45.00	8522 10.400
10.500		12.00	155.00	106.00	45.00	8522 10.500
10.720	27/64	12.00	155.00	106.00	45.00	8522 10.720
10.800		12.00	155.00	106.00	45.00	8522 10.800
11.000		12.00	155.00	106.00	45.00	8522 11.000
11.110	7/16	12.00	163.00	114.00	45.00	8522 11.110
11.300		12.00	163.00	114.00	45.00	8522 11.300
11.400		12.00	163.00	114.00	45.00	8522 11.400
11.500		12.00	163.00	114.00	45.00	8522 11.500
11.510	29/64	12.00	163.00	114.00	45.00	8522 11.510
11.910	15/32	12.00	163.00	114.00	45.00	8522 11.910
12.000		12.00	163.00	114.00	45.00	8522 12.000
12.300	31/64	14.00	182.00	133.00	45.00	8522 12.300
12.500		14.00	182.00	133.00	45.00	8522 12.500
12.700	1/2	14.00	182.00	133.00	45.00	8522 12.700
13.000		14.00	182.00	133.00	45.00	8522 13.000
13.100	33/64	14.00	182.00	133.00	45.00	8522 13.100
13.490	17/32	14.00	182.00	133.00	45.00	8522 13.490
13.500		14.00	182.00	133.00	45.00	8522 13.500
14.000		14.00	182.00	133.00	45.00	8522 14.000
14.290	9/16	16.00	204.00	152.00	48.00	8522 14.290
14.500		16.00	204.00	152.00	48.00	8522 14.500
15.000		16.00	204.00	152.00	48.00	8522 15.000
15.100		16.00	204.00	152.00	48.00	8522 15.100
15.500		16.00	204.00	152.00	48.00	8522 15.500
15.870	5/8	16.00	204.00	152.00	48.00	8522 15.870
16.000		16.00	204.00	152.00	48.00	8522 16.000

Ratio drills with coolant ducts

12xD | RT 100 U | WN | 135° | h7 | 48 HRC

Tool material	**Solid carbide**
Surface	F
Shank form	HA

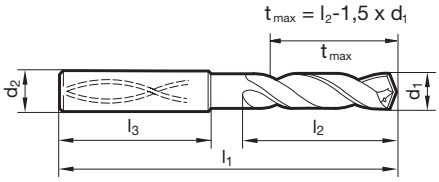
P	•
M	○
K	•
N	○
S	○
H	○

web thinning ≥ Ø 3.000 • facet point grind • main cutting edge form straight • optimised cutting geometry

structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • cast materials • bronze, brass • high-alloyed AlSi alloys

GÜHRINGNAVIGATOR

Cutting data page 298





Article no. **5525**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	90.00	50.00	36.00	5525 3.000
3.100		6.00	90.00	50.00	36.00	5525 3.100
3.170	1/8	6.00	90.00	50.00	36.00	5525 3.170
3.200		6.00	90.00	50.00	36.00	5525 3.200
3.250		6.00	90.00	50.00	36.00	5525 3.250
3.300		6.00	90.00	50.00	36.00	5525 3.300
3.400		6.00	90.00	50.00	36.00	5525 3.400
3.500		6.00	90.00	50.00	36.00	5525 3.500
3.570	9/64	6.00	90.00	50.00	36.00	5525 3.570
3.600		6.00	90.00	50.00	36.00	5525 3.600
3.700		6.00	90.00	50.00	36.00	5525 3.700
3.800		6.00	102.00	64.00	36.00	5525 3.800
3.900		6.00	102.00	64.00	36.00	5525 3.900
3.970	5/32	6.00	102.00	64.00	36.00	5525 3.970
4.000		6.00	102.00	64.00	36.00	5525 4.000
4.100		6.00	102.00	64.00	36.00	5525 4.100
4.200		6.00	102.00	64.00	36.00	5525 4.200
4.300		6.00	102.00	64.00	36.00	5525 4.300
4.370	11/64	6.00	102.00	64.00	36.00	5525 4.370
4.400		6.00	102.00	64.00	36.00	5525 4.400
4.500		6.00	102.00	64.00	36.00	5525 4.500
4.600		6.00	102.00	64.00	36.00	5525 4.600
4.650		6.00	102.00	64.00	36.00	5525 4.650
4.700		6.00	102.00	64.00	36.00	5525 4.700
4.760	3/16	6.00	116.00	78.00	36.00	5525 4.760
4.800		6.00	116.00	78.00	36.00	5525 4.800
4.900		6.00	116.00	78.00	36.00	5525 4.900
5.000		6.00	116.00	78.00	36.00	5525 5.000
5.100		6.00	116.00	78.00	36.00	5525 5.100
5.160	13/64	6.00	116.00	78.00	36.00	5525 5.160
5.200		6.00	116.00	78.00	36.00	5525 5.200
5.300		6.00	116.00	78.00	36.00	5525 5.300
5.400		6.00	116.00	78.00	36.00	5525 5.400
5.500		6.00	116.00	78.00	36.00	5525 5.500
5.560	7/32	6.00	116.00	78.00	36.00	5525 5.560
5.600		6.00	116.00	78.00	36.00	5525 5.600
5.700		6.00	116.00	78.00	36.00	5525 5.700
5.800		6.00	116.00	78.00	36.00	5525 5.800
5.900		6.00	116.00	78.00	36.00	5525 5.900
5.950	15/64	6.00	116.00	78.00	36.00	5525 5.950
6.000		6.00	116.00	78.00	36.00	5525 6.000
6.100		8.00	146.00	108.00	36.00	5525 6.100

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
6.200		8.00	146.00	108.00	36.00	5525 6.200
6.300		8.00	146.00	108.00	36.00	5525 6.300
6.350	1/4	8.00	146.00	108.00	36.00	5525 6.350
6.400		8.00	146.00	108.00	36.00	5525 6.400
6.500		8.00	146.00	108.00	36.00	5525 6.500
6.600		8.00	146.00	108.00	36.00	5525 6.600
6.700		8.00	146.00	108.00	36.00	5525 6.700
6.750	17/64	8.00	146.00	108.00	36.00	5525 6.750
6.800		8.00	146.00	108.00	36.00	5525 6.800
6.900		8.00	146.00	108.00	36.00	5525 6.900
7.000		8.00	146.00	108.00	36.00	5525 7.000
7.100		8.00	146.00	108.00	36.00	5525 7.100
7.140	9/32	8.00	146.00	108.00	36.00	5525 7.140
7.200		8.00	146.00	108.00	36.00	5525 7.200
7.300		8.00	146.00	108.00	36.00	5525 7.300
7.400		8.00	146.00	108.00	36.00	5525 7.400
7.500		8.00	146.00	108.00	36.00	5525 7.500
7.540	19/64	8.00	146.00	108.00	36.00	5525 7.540
7.600		8.00	146.00	108.00	36.00	5525 7.600
7.700		8.00	146.00	108.00	36.00	5525 7.700
7.800		8.00	146.00	108.00	36.00	5525 7.800
7.900		8.00	146.00	108.00	36.00	5525 7.900
7.940	5/16	8.00	146.00	108.00	36.00	5525 7.940
8.000		8.00	146.00	108.00	36.00	5525 8.000
8.100		10.00	162.00	120.00	40.00	5525 8.100
8.200		10.00	162.00	120.00	40.00	5525 8.200
8.300		10.00	162.00	120.00	40.00	5525 8.300
8.330	21/64	10.00	162.00	120.00	40.00	5525 8.330
8.400		10.00	162.00	120.00	40.00	5525 8.400
8.500		10.00	162.00	120.00	40.00	5525 8.500
8.600		10.00	162.00	120.00	40.00	5525 8.600
8.700		10.00	162.00	120.00	40.00	5525 8.700
8.730	11/32	10.00	162.00	120.00	40.00	5525 8.730
8.800		10.00	162.00	120.00	40.00	5525 8.800
8.900		10.00	162.00	120.00	40.00	5525 8.900
9.000		10.00	162.00	120.00	40.00	5525 9.000
9.100		10.00	162.00	120.00	40.00	5525 9.100
9.130	23/64	10.00	162.00	120.00	40.00	5525 9.130
9.200		10.00	162.00	120.00	40.00	5525 9.200
9.250		10.00	162.00	120.00	40.00	5525 9.250
9.300		10.00	162.00	120.00	40.00	5525 9.300
9.400		10.00	162.00	120.00	40.00	5525 9.400

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
9.500		10.00	162.00	120.00	40.00	5525 9.500
9.520	3/8	10.00	162.00	120.00	40.00	5525 9.520
9.600		10.00	162.00	120.00	40.00	5525 9.600
9.700		10.00	162.00	120.00	40.00	5525 9.700
9.800		10.00	162.00	120.00	40.00	5525 9.800
9.900		10.00	162.00	120.00	40.00	5525 9.900
9.920	25/64	10.00	162.00	120.00	40.00	5525 9.920
10.000		10.00	162.00	120.00	40.00	5525 10.000
10.100		12.00	204.00	156.00	45.00	5525 10.100
10.200		12.00	204.00	156.00	45.00	5525 10.200
10.300		12.00	204.00	156.00	45.00	5525 10.300
10.320	13/32	12.00	204.00	156.00	45.00	5525 10.320
10.500		12.00	204.00	156.00	45.00	5525 10.500
10.600		12.00	204.00	156.00	45.00	5525 10.600
10.700		12.00	204.00	156.00	45.00	5525 10.700
10.720	27/64	12.00	204.00	156.00	45.00	5525 10.720
10.800		12.00	204.00	156.00	45.00	5525 10.800
10.900		12.00	204.00	156.00	45.00	5525 10.900
11.000		12.00	204.00	156.00	45.00	5525 11.000
11.110	7/16	12.00	204.00	156.00	45.00	5525 11.110
11.500		12.00	204.00	156.00	45.00	5525 11.500
11.510	29/64	12.00	204.00	156.00	45.00	5525 11.510
11.910	15/32	12.00	204.00	156.00	45.00	5525 11.910
12.000		12.00	204.00	156.00	45.00	5525 12.000

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
12.300	31/64	14.00	230.00	182.00	45.00	5525 12.300
12.500		14.00	230.00	182.00	45.00	5525 12.500
12.700	1/2	14.00	230.00	182.00	45.00	5525 12.700
13.000		14.00	230.00	182.00	45.00	5525 13.000
13.490	17/32	14.00	230.00	182.00	45.00	5525 13.490
13.500		14.00	230.00	182.00	45.00	5525 13.500
13.890	35/64	14.00	230.00	182.00	45.00	5525 13.890
14.000		14.00	230.00	182.00	45.00	5525 14.000
14.500		16.00	260.00	208.00	48.00	5525 14.500
15.000		16.00	260.00	208.00	48.00	5525 15.000
15.480	39/64	16.00	260.00	208.00	48.00	5525 15.480
15.500		16.00	260.00	208.00	48.00	5525 15.500
16.000		16.00	260.00	208.00	48.00	5525 16.000
16.500		18.00	285.00	234.00	48.00	5525 16.500
17.000		18.00	285.00	234.00	48.00	5525 17.000
17.500		18.00	285.00	234.00	48.00	5525 17.500
18.000		18.00	285.00	234.00	48.00	5525 18.000
18.500		20.00	310.00	258.00	50.00	5525 18.500
19.000		20.00	310.00	258.00	50.00	5525 19.000
19.050	3/4	20.00	310.00	258.00	50.00	5525 19.050
19.500		20.00	310.00	258.00	50.00	5525 19.500
20.000		20.00	310.00	258.00	50.00	5525 20.000

Ratio drills with coolant ducts

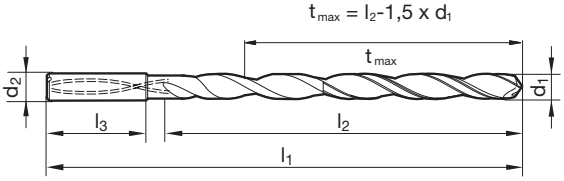
15xD | RT 100 T | WN | 135° | h7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	HA

P	●	web thinning ≥ Ø 3.000 • main cutting edge form concave • optimised flute design • maximum diameter of coolant ducts • observe coolant pressure
M	●	
K	●	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 302





Article no. **6509**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	95.00	55.00	36.00	6509 3.000
3.100		6.00	106.00	66.00	36.00	6509 3.100
3.170	1/8	6.00	106.00	66.00	36.00	6509 3.170
3.200		6.00	106.00	66.00	36.00	6509 3.200
3.300		6.00	106.00	66.00	36.00	6509 3.300
3.500		6.00	116.00	76.00	36.00	6509 3.500
3.570	9/64	6.00	116.00	76.00	36.00	6509 3.570
3.700		6.00	116.00	76.00	36.00	6509 3.700
3.800		6.00	116.00	76.00	36.00	6509 3.800
3.970	5/32	6.00	116.00	76.00	36.00	6509 3.970
4.000		6.00	116.00	76.00	36.00	6509 4.000
4.100		6.00	133.00	93.00	36.00	6509 4.100
4.200		6.00	133.00	93.00	36.00	6509 4.200
4.300		6.00	133.00	93.00	36.00	6509 4.300
4.370	11/64	6.00	133.00	93.00	36.00	6509 4.370
4.500		6.00	133.00	93.00	36.00	6509 4.500
4.600		6.00	133.00	93.00	36.00	6509 4.600
4.760	3/16	6.00	133.00	93.00	36.00	6509 4.760
4.800		6.00	133.00	93.00	36.00	6509 4.800
5.000		6.00	133.00	93.00	36.00	6509 5.000
5.100		6.00	150.00	110.00	36.00	6509 5.100
5.160	13/64	6.00	150.00	110.00	36.00	6509 5.160
5.410		6.00	150.00	110.00	36.00	6509 5.410
5.500		6.00	150.00	110.00	36.00	6509 5.500
5.560	7/32	6.00	150.00	110.00	36.00	6509 5.560
5.600		6.00	150.00	110.00	36.00	6509 5.600
5.800		6.00	150.00	110.00	36.00	6509 5.800
5.950	15/64	6.00	150.00	110.00	36.00	6509 5.950
6.000		6.00	150.00	110.00	36.00	6509 6.000
6.300		8.00	167.00	127.00	36.00	6509 6.300
6.350	1/4	8.00	167.00	127.00	36.00	6509 6.350
6.500		8.00	167.00	127.00	36.00	6509 6.500
6.750	17/64	8.00	167.00	127.00	36.00	6509 6.750
6.800		8.00	167.00	127.00	36.00	6509 6.800
7.000		8.00	167.00	127.00	36.00	6509 7.000
7.140	9/32	8.00	183.00	143.00	36.00	6509 7.140
7.500		8.00	183.00	143.00	36.00	6509 7.500
7.540	19/64	8.00	183.00	143.00	36.00	6509 7.540
7.800		8.00	183.00	143.00	36.00	6509 7.800
7.940	5/16	8.00	183.00	143.00	36.00	6509 7.940
8.000		8.00	183.00	143.00	36.00	6509 8.000
8.330	21/64	10.00	204.00	160.00	40.00	6509 8.330

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
8.500		10.00	204.00	160.00	40.00	6509 8.500
8.730	11/32	10.00	204.00	160.00	40.00	6509 8.730
8.800		10.00	204.00	160.00	40.00	6509 8.800
9.000		10.00	204.00	160.00	40.00	6509 9.000
9.130	23/64	10.00	221.00	177.00	40.00	6509 9.130
9.500		10.00	221.00	177.00	40.00	6509 9.500
9.520	3/8	10.00	221.00	177.00	40.00	6509 9.520
9.800		10.00	221.00	177.00	40.00	6509 9.800
9.920	25/64	10.00	221.00	177.00	40.00	6509 9.920
10.000		10.00	221.00	177.00	40.00	6509 10.000
10.200		12.00	247.00	198.00	45.00	6509 10.200
10.320	13/32	12.00	247.00	198.00	45.00	6509 10.320
10.500		12.00	247.00	198.00	45.00	6509 10.500
10.720	27/64	12.00	247.00	198.00	45.00	6509 10.720
11.000		12.00	247.00	198.00	45.00	6509 11.000
11.110	7/16	12.00	263.00	214.00	45.00	6509 11.110
11.510	29/64	12.00	263.00	214.00	45.00	6509 11.510
11.800		12.00	263.00	214.00	45.00	6509 11.800
11.910	15/32	12.00	263.00	214.00	45.00	6509 11.910
12.000		12.00	263.00	214.00	45.00	6509 12.000
12.300	31/64	14.00	297.00	248.00	45.00	6509 12.300
12.500		14.00	297.00	248.00	45.00	6509 12.500
12.700	1/2	14.00	297.00	248.00	45.00	6509 12.700
13.000		14.00	297.00	248.00	45.00	6509 13.000
13.100	33/64	14.00	297.00	248.00	45.00	6509 13.100
13.490	17/32	14.00	297.00	248.00	45.00	6509 13.490
13.890	35/64	14.00	297.00	248.00	45.00	6509 13.890
14.000		14.00	297.00	248.00	45.00	6509 14.000
14.290	9/16	16.00	333.00	281.00	48.00	6509 14.290
15.000		16.00	333.00	281.00	48.00	6509 15.000
15.870	5/8	16.00	333.00	281.00	48.00	6509 15.870
16.000		16.00	333.00	281.00	48.00	6509 16.000

Ratio drills with coolant ducts

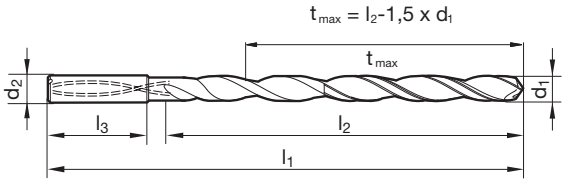
20xD | RT 100 T | WN | 135° | h7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • main cutting edge form concave • optimised flute design • maximum diameter of coolant ducts • observe coolant pressure
M	•	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 302





Article no. **6511**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	110.00	70.00	36.00	6511 3.000
3.100		6.00	123.00	83.00	36.00	6511 3.100
3.170	1/8	6.00	123.00	83.00	36.00	6511 3.170
3.200		6.00	123.00	83.00	36.00	6511 3.200
3.300		6.00	123.00	83.00	36.00	6511 3.300
3.500		6.00	136.00	96.00	36.00	6511 3.500
3.570	9/64	6.00	136.00	96.00	36.00	6511 3.570
3.700		6.00	136.00	96.00	36.00	6511 3.700
3.800		6.00	136.00	96.00	36.00	6511 3.800
3.970	5/32	6.00	136.00	96.00	36.00	6511 3.970
4.000		6.00	136.00	96.00	36.00	6511 4.000
4.100		6.00	158.00	118.00	36.00	6511 4.100
4.200		6.00	158.00	118.00	36.00	6511 4.200
4.300		6.00	158.00	118.00	36.00	6511 4.300
4.370	11/64	6.00	158.00	118.00	36.00	6511 4.370
4.500		6.00	158.00	118.00	36.00	6511 4.500
4.600		6.00	158.00	118.00	36.00	6511 4.600
4.760	3/16	6.00	158.00	118.00	36.00	6511 4.760
4.800		6.00	158.00	118.00	36.00	6511 4.800
5.000		6.00	158.00	118.00	36.00	6511 5.000
5.100		6.00	180.00	140.00	36.00	6511 5.100
5.160	13/64	6.00	180.00	140.00	36.00	6511 5.160
5.410		6.00	180.00	140.00	36.00	6511 5.410
5.500		6.00	180.00	140.00	36.00	6511 5.500
5.560	7/32	6.00	180.00	140.00	36.00	6511 5.560
5.800		6.00	180.00	140.00	36.00	6511 5.800
5.950	15/64	6.00	180.00	140.00	36.00	6511 5.950
6.000		6.00	180.00	140.00	36.00	6511 6.000
6.300		8.00	202.00	162.00	36.00	6511 6.300
6.350	1/4	8.00	202.00	162.00	36.00	6511 6.350
6.500		8.00	202.00	162.00	36.00	6511 6.500
6.750	17/64	8.00	202.00	162.00	36.00	6511 6.750
6.800		8.00	202.00	162.00	36.00	6511 6.800
7.000		8.00	202.00	162.00	36.00	6511 7.000
7.140	9/32	8.00	223.00	183.00	36.00	6511 7.140
7.500		8.00	223.00	183.00	36.00	6511 7.500

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
7.540	19/64	8.00	223.00	183.00	36.00	6511 7.540
7.800		8.00	223.00	183.00	36.00	6511 7.800
7.940	5/16	8.00	223.00	183.00	36.00	6511 7.940
8.000		8.00	223.00	183.00	36.00	6511 8.000
8.330	21/64	10.00	249.00	205.00	40.00	6511 8.330
8.500		10.00	249.00	205.00	40.00	6511 8.500
8.730	11/32	10.00	249.00	205.00	40.00	6511 8.730
8.800		10.00	249.00	205.00	40.00	6511 8.800
9.000		10.00	249.00	205.00	40.00	6511 9.000
9.130	23/64	10.00	271.00	227.00	40.00	6511 9.130
9.520	3/8	10.00	271.00	227.00	40.00	6511 9.520
9.920	25/64	10.00	271.00	227.00	40.00	6511 9.920
10.000		10.00	271.00	227.00	40.00	6511 10.000
10.200		12.00	302.00	253.00	45.00	6511 10.200
10.320	13/32	12.00	302.00	253.00	45.00	6511 10.320
10.500		12.00	302.00	253.00	45.00	6511 10.500
10.720	27/64	12.00	302.00	253.00	45.00	6511 10.720
11.000		12.00	302.00	253.00	45.00	6511 11.000
11.110	7/16	12.00	323.00	274.00	45.00	6511 11.110
11.510	29/64	12.00	323.00	274.00	45.00	6511 11.510
11.800		12.00	323.00	274.00	45.00	6511 11.800
11.910	15/32	12.00	323.00	274.00	45.00	6511 11.910
12.000		12.00	323.00	274.00	45.00	6511 12.000
12.300	31/64	14.00	367.00	318.00	45.00	6511 12.300
12.500		14.00	367.00	318.00	45.00	6511 12.500
12.700	1/2	14.00	367.00	318.00	45.00	6511 12.700
13.000		14.00	367.00	318.00	45.00	6511 13.000
13.100	33/64	14.00	367.00	318.00	45.00	6511 13.100
13.490	17/32	14.00	367.00	318.00	45.00	6511 13.490
13.890	35/64	14.00	367.00	318.00	45.00	6511 13.890
14.000		14.00	367.00	318.00	45.00	6511 14.000
14.290	9/16	16.00	413.00	361.00	48.00	6511 14.290
15.000		16.00	413.00	361.00	48.00	6511 15.000
15.870	5/8	16.00	413.00	361.00	48.00	6511 15.870
16.000		16.00	413.00	361.00	48.00	6511 16.000

Ratio drills with coolant ducts

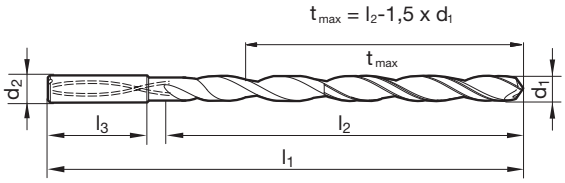
25xD | RT 100 T | WN | 135° | h7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	HA

P	●	web thinning ≥ Ø 3.000 • main cutting edge form concave • optimised flute design • maximum diameter of coolant ducts • observe coolant pressure
M	●	
K	●	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H	○	

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Cutting data page 302





Article no. **6512**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	125.00	85.00	36.00	6512 3.000
3.100		6.00	141.00	101.00	36.00	6512 3.100
3.170	1/8	6.00	141.00	101.00	36.00	6512 3.170
3.200		6.00	141.00	101.00	36.00	6512 3.200
3.300		6.00	141.00	101.00	36.00	6512 3.300
3.500		6.00	156.00	116.00	36.00	6512 3.500
3.570	9/64	6.00	156.00	116.00	36.00	6512 3.570
3.700		6.00	156.00	116.00	36.00	6512 3.700
3.800		6.00	156.00	116.00	36.00	6512 3.800
3.970	5/32	6.00	156.00	116.00	36.00	6512 3.970
4.000		6.00	156.00	116.00	36.00	6512 4.000
4.100		6.00	183.00	143.00	36.00	6512 4.100
4.200		6.00	183.00	143.00	36.00	6512 4.200
4.300		6.00	183.00	143.00	36.00	6512 4.300
4.370	11/64	6.00	183.00	143.00	36.00	6512 4.370
4.500		6.00	183.00	143.00	36.00	6512 4.500
4.600		6.00	183.00	143.00	36.00	6512 4.600
4.760	3/16	6.00	183.00	143.00	36.00	6512 4.760
4.800		6.00	183.00	143.00	36.00	6512 4.800
5.000		6.00	183.00	143.00	36.00	6512 5.000
5.100		6.00	210.00	170.00	36.00	6512 5.100
5.160	13/64	6.00	210.00	170.00	36.00	6512 5.160
5.410		6.00	210.00	170.00	36.00	6512 5.410
5.500		6.00	210.00	170.00	36.00	6512 5.500
5.560	7/32	6.00	210.00	170.00	36.00	6512 5.560
5.800		6.00	210.00	170.00	36.00	6512 5.800
5.950	15/64	6.00	210.00	170.00	36.00	6512 5.950
6.000		6.00	210.00	170.00	36.00	6512 6.000
6.300		8.00	237.00	197.00	36.00	6512 6.300
6.350	1/4	8.00	237.00	197.00	36.00	6512 6.350
6.500		8.00	237.00	197.00	36.00	6512 6.500
6.750	17/64	8.00	237.00	197.00	36.00	6512 6.750
6.800		8.00	237.00	197.00	36.00	6512 6.800
7.000		8.00	237.00	197.00	36.00	6512 7.000
7.140	9/32	8.00	263.00	223.00	36.00	6512 7.140
7.500		8.00	263.00	223.00	36.00	6512 7.500

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
7.540	19/64	8.00	263.00	223.00	36.00	6512 7.540
7.940	5/16	8.00	263.00	223.00	36.00	6512 7.940
8.000		8.00	263.00	223.00	36.00	6512 8.000
8.330	21/64	10.00	294.00	250.00	40.00	6512 8.330
8.500		10.00	294.00	250.00	40.00	6512 8.500
8.730	11/32	10.00	294.00	250.00	40.00	6512 8.730
8.800		10.00	294.00	250.00	40.00	6512 8.800
9.000		10.00	294.00	250.00	40.00	6512 9.000
9.130	23/64	10.00	321.00	277.00	40.00	6512 9.130
9.520	3/8	10.00	321.00	277.00	40.00	6512 9.520
9.920	25/64	10.00	321.00	277.00	40.00	6512 9.920
10.000		10.00	321.00	277.00	40.00	6512 10.000
10.320	13/32	12.00	359.00	310.00	45.00	6512 10.320
10.720	27/64	12.00	359.00	310.00	45.00	6512 10.720
11.000		12.00	359.00	310.00	45.00	6512 11.000
11.110	7/16	12.00	386.00	337.00	45.00	6512 11.110
11.510	29/64	12.00	386.00	337.00	45.00	6512 11.510
11.910	15/32	12.00	386.00	337.00	45.00	6512 11.910
12.000		12.00	386.00	337.00	45.00	6512 12.000
12.300	31/64	14.00	437.00	388.00	45.00	6512 12.300
12.700	1/2	14.00	437.00	388.00	45.00	6512 12.700
13.000		14.00	437.00	388.00	45.00	6512 13.000
13.100	33/64	14.00	437.00	388.00	45.00	6512 13.100
13.490	17/32	14.00	437.00	388.00	45.00	6512 13.490
13.890	35/64	14.00	437.00	388.00	45.00	6512 13.890
14.000		14.00	437.00	388.00	45.00	6512 14.000
14.290	9/16	16.00	493.00	441.00	48.00	6512 14.290
15.000		16.00	493.00	441.00	48.00	6512 15.000
15.870	5/8	16.00	493.00	441.00	48.00	6512 15.870
16.000		16.00	493.00	441.00	48.00	6512 16.000

Ratio drills with coolant ducts

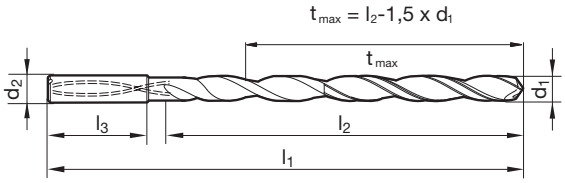
30xD | RT 100 T | WN | 135° | h7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • main cutting edge form concave • optimised flute design • maximum diameter of coolant ducts • observe coolant pressure
M	•	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 302





Article no. **6513**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	140.00	100.00	36.00	6513 3.000
3.100		6.00	158.00	118.00	36.00	6513 3.100
3.170	1/8	6.00	158.00	118.00	36.00	6513 3.170
3.200		6.00	158.00	118.00	36.00	6513 3.200
3.300		6.00	158.00	118.00	36.00	6513 3.300
3.500		6.00	176.00	136.00	36.00	6513 3.500
3.570	9/64	6.00	176.00	136.00	36.00	6513 3.570
3.700		6.00	176.00	136.00	36.00	6513 3.700
3.800		6.00	176.00	136.00	36.00	6513 3.800
3.970	5/32	6.00	176.00	136.00	36.00	6513 3.970
4.000		6.00	176.00	136.00	36.00	6513 4.000
4.100		6.00	208.00	168.00	36.00	6513 4.100
4.200		6.00	208.00	168.00	36.00	6513 4.200
4.370	11/64	6.00	208.00	168.00	36.00	6513 4.370
4.500		6.00	208.00	168.00	36.00	6513 4.500
4.760	3/16	6.00	208.00	168.00	36.00	6513 4.760
5.000		6.00	208.00	168.00	36.00	6513 5.000
5.100		6.00	240.00	200.00	36.00	6513 5.100
5.160	13/64	6.00	240.00	200.00	36.00	6513 5.160
5.410		6.00	240.00	200.00	36.00	6513 5.410
5.500		6.00	240.00	200.00	36.00	6513 5.500
5.560	7/32	6.00	240.00	200.00	36.00	6513 5.560
5.950	15/64	6.00	240.00	200.00	36.00	6513 5.950
6.000		6.00	240.00	200.00	36.00	6513 6.000
6.300		8.00	272.00	232.00	36.00	6513 6.300
6.350	1/4	8.00	272.00	232.00	36.00	6513 6.350
6.500		8.00	272.00	232.00	36.00	6513 6.500
6.750	17/64	8.00	272.00	232.00	36.00	6513 6.750
6.800		8.00	272.00	232.00	36.00	6513 6.800
7.000		8.00	272.00	232.00	36.00	6513 7.000

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
7.140	9/32	8.00	303.00	263.00	36.00	6513 7.140
7.500		8.00	303.00	263.00	36.00	6513 7.500
7.540	19/64	8.00	303.00	263.00	36.00	6513 7.540
7.940	5/16	8.00	303.00	263.00	36.00	6513 7.940
8.000		8.00	303.00	263.00	36.00	6513 8.000
8.330	21/64	10.00	339.00	295.00	40.00	6513 8.330
8.500		10.00	339.00	295.00	40.00	6513 8.500
8.730	11/32	10.00	339.00	295.00	40.00	6513 8.730
8.800		10.00	339.00	295.00	40.00	6513 8.800
9.000		10.00	339.00	295.00	40.00	6513 9.000
9.130	23/64	10.00	371.00	327.00	40.00	6513 9.130
9.520	3/8	10.00	371.00	327.00	40.00	6513 9.520
9.920	25/64	10.00	371.00	327.00	40.00	6513 9.920
10.000		10.00	371.00	327.00	40.00	6513 10.000
10.320	13/32	12.00	412.00	363.00	45.00	6513 10.320
10.720	27/64	12.00	412.00	363.00	45.00	6513 10.720
11.000		12.00	412.00	363.00	45.00	6513 11.000
11.110	7/16	12.00	443.00	394.00	45.00	6513 11.110
11.510	29/64	12.00	443.00	394.00	45.00	6513 11.510
11.910	15/32	12.00	443.00	394.00	45.00	6513 11.910
12.000		12.00	443.00	394.00	45.00	6513 12.000
12.300	31/64	14.00	507.00	458.00	45.00	6513 12.300
12.700	1/2	14.00	507.00	458.00	45.00	6513 12.700
13.000		14.00	507.00	458.00	45.00	6513 13.000
13.100	33/64	14.00	507.00	458.00	45.00	6513 13.100
13.490	17/32	14.00	507.00	458.00	45.00	6513 13.490
13.890	35/64	14.00	507.00	458.00	45.00	6513 13.890
14.000		14.00	507.00	458.00	45.00	6513 14.000

Ratio drills with coolant ducts

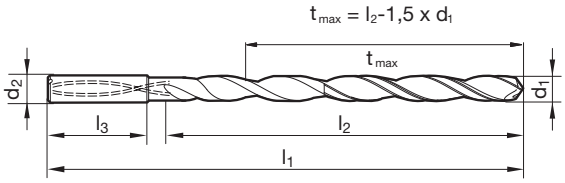
40xD | RT 100 T | WN | 135° | h7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • main cutting edge form concave • optimised flute design • maximum diameter of coolant ducts • observe coolant pressure
M	•	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 302





Article no. **6514**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	170.00	130.00	36.00	6514 3.000
3.100		6.00	193.00	153.00	36.00	6514 3.100
3.170	1/8	6.00	193.00	153.00	36.00	6514 3.170
3.200		6.00	193.00	153.00	36.00	6514 3.200
3.300		6.00	193.00	153.00	36.00	6514 3.300
3.500		6.00	193.00	153.00	36.00	6514 3.500
3.570	9/64	6.00	216.00	176.00	36.00	6514 3.570
3.800		6.00	216.00	176.00	36.00	6514 3.800
3.970	5/32	6.00	216.00	176.00	36.00	6514 3.970
4.000		6.00	216.00	176.00	36.00	6514 4.000
4.200		6.00	238.00	198.00	36.00	6514 4.200
4.370	11/64	6.00	238.00	198.00	36.00	6514 4.370
4.500		6.00	238.00	198.00	36.00	6514 4.500
4.760	3/16	6.00	258.00	218.00	36.00	6514 4.760
5.000		6.00	258.00	218.00	36.00	6514 5.000
5.100		6.00	280.00	240.00	36.00	6514 5.100
5.160	13/64	6.00	280.00	240.00	36.00	6514 5.160
5.410		6.00	280.00	240.00	36.00	6514 5.410

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.500		6.00	280.00	240.00	36.00	6514 5.500
5.560	7/32	6.00	300.00	260.00	36.00	6514 5.560
5.950	15/64	6.00	300.00	260.00	36.00	6514 5.950
6.000		6.00	300.00	260.00	36.00	6514 6.000
6.300		8.00	322.00	282.00	36.00	6514 6.300
6.350	1/4	8.00	322.00	282.00	36.00	6514 6.350
6.500		8.00	322.00	282.00	36.00	6514 6.500
6.750	17/64	8.00	342.00	302.00	36.00	6514 6.750
6.800		8.00	342.00	302.00	36.00	6514 6.800
7.000		8.00	342.00	302.00	36.00	6514 7.000
7.140	9/32	8.00	363.00	323.00	36.00	6514 7.140
7.500		8.00	363.00	323.00	36.00	6514 7.500
7.540	19/64	8.00	383.00	343.00	36.00	6514 7.540
7.940	5/16	8.00	383.00	343.00	36.00	6514 7.940
8.000		8.00	383.00	343.00	36.00	6514 8.000
8.500		10.00	409.00	365.00	40.00	6514 8.500
9.000		10.00	429.00	386.00	40.00	6514 9.000
10.000		10.00	471.00	427.00	40.00	6514 10.000

Ratio drills without coolant ducts

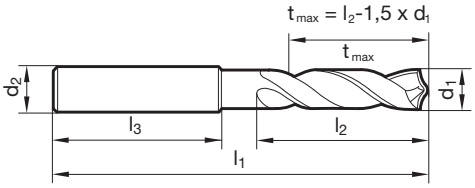
3xD | RT 100 U | DIN 6537 K | 140° | m7 | 48 HRC

Tool material	Solid carbide
Surface	F
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • facet point grind • main cutting edge form straight • optimised cutting geometry
M	○	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • steels (alloyed/unalloyed) up to 1200 N/mm² • cast materials • bronze, brass • high-alloyed AlSi alloys
S	○	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 296





Article no. **5514**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	62.00	20.00	36.00	5514 3.000
3.100		6.00	62.00	20.00	36.00	5514 3.100
3.170	1/8	6.00	62.00	20.00	36.00	5514 3.170
3.200		6.00	62.00	20.00	36.00	5514 3.200
3.250		6.00	62.00	20.00	36.00	5514 3.250
3.300		6.00	62.00	20.00	36.00	5514 3.300
3.400		6.00	62.00	20.00	36.00	5514 3.400
3.500		6.00	62.00	20.00	36.00	5514 3.500
3.570	9/64	6.00	62.00	20.00	36.00	5514 3.570
3.600		6.00	62.00	20.00	36.00	5514 3.600
3.700		6.00	62.00	20.00	36.00	5514 3.700
3.800		6.00	66.00	24.00	36.00	5514 3.800
3.900		6.00	66.00	24.00	36.00	5514 3.900
3.970	5/32	6.00	66.00	24.00	36.00	5514 3.970
4.000		6.00	66.00	24.00	36.00	5514 4.000
4.040		6.00	66.00	24.00	36.00	5514 4.040
4.100		6.00	66.00	24.00	36.00	5514 4.100
4.200		6.00	66.00	24.00	36.00	5514 4.200
4.300		6.00	66.00	24.00	36.00	5514 4.300
4.370	11/64	6.00	66.00	24.00	36.00	5514 4.370
4.400		6.00	66.00	24.00	36.00	5514 4.400
4.500		6.00	66.00	24.00	36.00	5514 4.500
4.600		6.00	66.00	24.00	36.00	5514 4.600
4.650		6.00	66.00	24.00	36.00	5514 4.650
4.700		6.00	66.00	24.00	36.00	5514 4.700
4.760	3/16	6.00	66.00	28.00	36.00	5514 4.760
4.800		6.00	66.00	28.00	36.00	5514 4.800
4.900		6.00	66.00	28.00	36.00	5514 4.900
5.000		6.00	66.00	28.00	36.00	5514 5.000
5.100		6.00	66.00	28.00	36.00	5514 5.100
5.110		6.00	66.00	28.00	36.00	5514 5.110
5.160	13/64	6.00	66.00	28.00	36.00	5514 5.160
5.200		6.00	66.00	28.00	36.00	5514 5.200
5.250		6.00	66.00	28.00	36.00	5514 5.250
5.300		6.00	66.00	28.00	36.00	5514 5.300
5.400		6.00	66.00	28.00	36.00	5514 5.400
5.410		6.00	66.00	28.00	36.00	5514 5.410
5.500		6.00	66.00	28.00	36.00	5514 5.500
5.550		6.00	66.00	28.00	36.00	5514 5.550
5.560	7/32	6.00	66.00	28.00	36.00	5514 5.560
5.600		6.00	66.00	28.00	36.00	5514 5.600
5.700		6.00	66.00	28.00	36.00	5514 5.700

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.800		6.00	66.00	28.00	36.00	5514 5.800
5.900		6.00	66.00	28.00	36.00	5514 5.900
5.950	15/64	6.00	66.00	28.00	36.00	5514 5.950
6.000		6.00	66.00	28.00	36.00	5514 6.000
6.100		8.00	79.00	34.00	36.00	5514 6.100
6.200		8.00	79.00	34.00	36.00	5514 6.200
6.300		8.00	79.00	34.00	36.00	5514 6.300
6.350	1/4	8.00	79.00	34.00	36.00	5514 6.350
6.400		8.00	79.00	34.00	36.00	5514 6.400
6.500		8.00	79.00	34.00	36.00	5514 6.500
6.530		8.00	79.00	34.00	36.00	5514 6.530
6.600		8.00	79.00	34.00	36.00	5514 6.600
6.700		8.00	79.00	34.00	36.00	5514 6.700
6.750	17/64	8.00	79.00	34.00	36.00	5514 6.750
6.800		8.00	79.00	34.00	36.00	5514 6.800
6.900		8.00	79.00	34.00	36.00	5514 6.900
7.000		8.00	79.00	34.00	36.00	5514 7.000
7.100		8.00	79.00	41.00	36.00	5514 7.100
7.140	9/32	8.00	79.00	41.00	36.00	5514 7.140
7.200		8.00	79.00	41.00	36.00	5514 7.200
7.300		8.00	79.00	41.00	36.00	5514 7.300
7.400		8.00	79.00	41.00	36.00	5514 7.400
7.500		8.00	79.00	41.00	36.00	5514 7.500
7.540	19/64	8.00	79.00	41.00	36.00	5514 7.540
7.600		8.00	79.00	41.00	36.00	5514 7.600
7.700		8.00	79.00	41.00	36.00	5514 7.700
7.800		8.00	79.00	41.00	36.00	5514 7.800
7.900		8.00	79.00	41.00	36.00	5514 7.900
7.940	5/16	8.00	79.00	41.00	36.00	5514 7.940
8.000		8.00	79.00	41.00	36.00	5514 8.000
8.100		10.00	89.00	47.00	40.00	5514 8.100
8.200		10.00	89.00	47.00	40.00	5514 8.200
8.300		10.00	89.00	47.00	40.00	5514 8.300
8.330	21/64	10.00	89.00	47.00	40.00	5514 8.330
8.400		10.00	89.00	47.00	40.00	5514 8.400
8.500		10.00	89.00	47.00	40.00	5514 8.500
8.600		10.00	89.00	47.00	40.00	5514 8.600
8.700		10.00	89.00	47.00	40.00	5514 8.700
8.730	11/32	10.00	89.00	47.00	40.00	5514 8.730
8.800		10.00	89.00	47.00	40.00	5514 8.800
8.900		10.00	89.00	47.00	40.00	5514 8.900
9.000		10.00	89.00	47.00	40.00	5514 9.000

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
9.100		10.00	89.00	47.00	40.00	5514 9.100
9.130	23/64	10.00	89.00	47.00	40.00	5514 9.130
9.200		10.00	89.00	47.00	40.00	5514 9.200
9.250		10.00	89.00	47.00	40.00	5514 9.250
9.300		10.00	89.00	47.00	40.00	5514 9.300
9.340		10.00	89.00	47.00	40.00	5514 9.340
9.400		10.00	89.00	47.00	40.00	5514 9.400
9.500		10.00	89.00	47.00	40.00	5514 9.500
9.520	3/8	10.00	89.00	47.00	40.00	5514 9.520
9.600		10.00	89.00	47.00	40.00	5514 9.600
9.700		10.00	89.00	47.00	40.00	5514 9.700
9.800		10.00	89.00	47.00	40.00	5514 9.800
9.900		10.00	89.00	47.00	40.00	5514 9.900
9.920	25/64	10.00	89.00	47.00	40.00	5514 9.920
10.000		10.00	89.00	47.00	40.00	5514 10.000
10.100		12.00	102.00	55.00	45.00	5514 10.100
10.200		12.00	102.00	55.00	45.00	5514 10.200
10.300		12.00	102.00	55.00	45.00	5514 10.300
10.320	13/32	12.00	102.00	55.00	45.00	5514 10.320
10.400		12.00	102.00	55.00	45.00	5514 10.400
10.500		12.00	102.00	55.00	45.00	5514 10.500
10.600		12.00	102.00	55.00	45.00	5514 10.600
10.700		12.00	102.00	55.00	45.00	5514 10.700
10.720	27/64	12.00	102.00	55.00	45.00	5514 10.720
10.800		12.00	102.00	55.00	45.00	5514 10.800
10.900		12.00	102.00	55.00	45.00	5514 10.900
11.000		12.00	102.00	55.00	45.00	5514 11.000
11.100		12.00	102.00	55.00	45.00	5514 11.100
11.110	7/16	12.00	102.00	55.00	45.00	5514 11.110
11.200		12.00	102.00	55.00	45.00	5514 11.200
11.300		12.00	102.00	55.00	45.00	5514 11.300
11.400		12.00	102.00	55.00	45.00	5514 11.400
11.500		12.00	102.00	55.00	45.00	5514 11.500
11.510	29/64	12.00	102.00	55.00	45.00	5514 11.510
11.600		12.00	102.00	55.00	45.00	5514 11.600
11.700		12.00	102.00	55.00	45.00	5514 11.700
11.800		12.00	102.00	55.00	45.00	5514 11.800
11.900		12.00	102.00	55.00	45.00	5514 11.900
11.910	15/32	12.00	102.00	55.00	45.00	5514 11.910
12.000		12.00	102.00	55.00	45.00	5514 12.000
12.100		14.00	107.00	60.00	45.00	5514 12.100
12.200		14.00	107.00	60.00	45.00	5514 12.200
12.300	31/64	14.00	107.00	60.00	45.00	5514 12.300
12.400		14.00	107.00	60.00	45.00	5514 12.400
12.500		14.00	107.00	60.00	45.00	5514 12.500
12.600		14.00	107.00	60.00	45.00	5514 12.600
12.700	1/2	14.00	107.00	60.00	45.00	5514 12.700
12.800		14.00	107.00	60.00	45.00	5514 12.800
12.900		14.00	107.00	60.00	45.00	5514 12.900
13.000		14.00	107.00	60.00	45.00	5514 13.000
13.100	33/64	14.00	107.00	60.00	45.00	5514 13.100
13.200		14.00	107.00	60.00	45.00	5514 13.200
13.300		14.00	107.00	60.00	45.00	5514 13.300
13.400		14.00	107.00	60.00	45.00	5514 13.400

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
13.490	17/32	14.00	107.00	60.00	45.00	5514 13.490
13.500		14.00	107.00	60.00	45.00	5514 13.500
13.600		14.00	107.00	60.00	45.00	5514 13.600
13.700		14.00	107.00	60.00	45.00	5514 13.700
13.800		14.00	107.00	60.00	45.00	5514 13.800
13.890	35/64	14.00	107.00	60.00	45.00	5514 13.890
13.900		14.00	107.00	60.00	45.00	5514 13.900
14.000		14.00	107.00	60.00	45.00	5514 14.000
14.100		16.00	115.00	65.00	48.00	5514 14.100
14.200		16.00	115.00	65.00	48.00	5514 14.200
14.290	9/16	16.00	115.00	65.00	48.00	5514 14.290
14.300		16.00	115.00	65.00	48.00	5514 14.300
14.400		16.00	115.00	65.00	48.00	5514 14.400
14.500		16.00	115.00	65.00	48.00	5514 14.500
14.600		16.00	115.00	65.00	48.00	5514 14.600
14.680	37/64	16.00	115.00	65.00	48.00	5514 14.680
14.700		16.00	115.00	65.00	48.00	5514 14.700
14.800		16.00	115.00	65.00	48.00	5514 14.800
14.900		16.00	115.00	65.00	48.00	5514 14.900
15.000		16.00	115.00	65.00	48.00	5514 15.000
15.080	19/32	16.00	115.00	65.00	48.00	5514 15.080
15.100		16.00	115.00	65.00	48.00	5514 15.100
15.200		16.00	115.00	65.00	48.00	5514 15.200
15.300		16.00	115.00	65.00	48.00	5514 15.300
15.400		16.00	115.00	65.00	48.00	5514 15.400
15.480	39/64	16.00	115.00	65.00	48.00	5514 15.480
15.500		16.00	115.00	65.00	48.00	5514 15.500
15.600		16.00	115.00	65.00	48.00	5514 15.600
15.700		16.00	115.00	65.00	48.00	5514 15.700
15.800		16.00	115.00	65.00	48.00	5514 15.800
15.870	5/8	16.00	115.00	65.00	48.00	5514 15.870
15.900		16.00	115.00	65.00	48.00	5514 15.900
16.000		16.00	115.00	65.00	48.00	5514 16.000
16.270	41/64	18.00	123.00	73.00	48.00	5514 16.270
16.500		18.00	123.00	73.00	48.00	5514 16.500
16.670	21/32	18.00	123.00	73.00	48.00	5514 16.670
17.000		18.00	123.00	73.00	48.00	5514 17.000
17.070	43/64	18.00	123.00	73.00	48.00	5514 17.070
17.460	11/16	18.00	123.00	73.00	48.00	5514 17.460
17.500		18.00	123.00	73.00	48.00	5514 17.500
17.860	45/64	18.00	123.00	73.00	48.00	5514 17.860
18.000		18.00	123.00	73.00	48.00	5514 18.000
18.260	23/32	20.00	131.00	79.00	50.00	5514 18.260
18.500		20.00	131.00	79.00	50.00	5514 18.500
19.000		20.00	131.00	79.00	50.00	5514 19.000
19.050	3/4	20.00	131.00	79.00	50.00	5514 19.050
19.250		20.00	131.00	79.00	50.00	5514 19.250
19.446		20.00	131.00	79.00	50.00	5514 19.446
19.500		20.00	131.00	79.00	50.00	5514 19.500
19.840	25/32	20.00	131.00	79.00	50.00	5514 19.840
20.000		20.00	131.00	79.00	50.00	5514 20.000

Ratio drills without coolant ducts

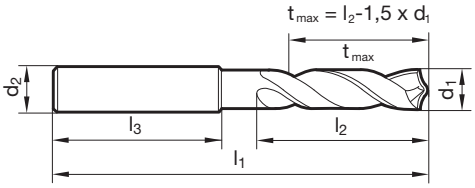
3xD | RT 100 HF | DIN 6537 K | 140° | m7 | 65 HRC

Tool material	**Solid carbide**
Surface	Y
Shank form	HA

P	•	web thinning ≥ Ø 3.000 • relieved cone • main cutting edge is slightly concave • optimised cutting geometry • double margin
M		
K		
N		alloyed and high tensile steels up to 1600 N/mm² • Inconel, Hastelloy, Monel • Titanium and Titanium alloys
S	•	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 296





Article no. **8524**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		6.00	62.00	20.00	36.00	8524 3.000
3.100		6.00	62.00	20.00	36.00	8524 3.100
3.170	1/8	6.00	62.00	20.00	36.00	8524 3.170
3.200		6.00	62.00	20.00	36.00	8524 3.200
3.250		6.00	62.00	20.00	36.00	8524 3.250
3.300		6.00	62.00	20.00	36.00	8524 3.300
3.400		6.00	62.00	20.00	36.00	8524 3.400
3.500		6.00	62.00	20.00	36.00	8524 3.500
3.570	9/64	6.00	62.00	20.00	36.00	8524 3.570
3.600		6.00	62.00	20.00	36.00	8524 3.600
3.700		6.00	62.00	20.00	36.00	8524 3.700
3.800		6.00	66.00	24.00	36.00	8524 3.800
3.900		6.00	66.00	24.00	36.00	8524 3.900
3.970	5/32	6.00	66.00	24.00	36.00	8524 3.970
4.000		6.00	66.00	24.00	36.00	8524 4.000
4.100		6.00	66.00	24.00	36.00	8524 4.100
4.200		6.00	66.00	24.00	36.00	8524 4.200
4.300		6.00	66.00	24.00	36.00	8524 4.300
4.370	11/64	6.00	66.00	24.00	36.00	8524 4.370
4.400		6.00	66.00	24.00	36.00	8524 4.400
4.500		6.00	66.00	24.00	36.00	8524 4.500
4.600		6.00	66.00	24.00	36.00	8524 4.600
4.650		6.00	66.00	24.00	36.00	8524 4.650
4.700		6.00	66.00	24.00	36.00	8524 4.700
4.760	3/16	6.00	66.00	28.00	36.00	8524 4.760
4.800		6.00	66.00	28.00	36.00	8524 4.800
4.900		6.00	66.00	28.00	36.00	8524 4.900
5.000		6.00	66.00	28.00	36.00	8524 5.000
5.100		6.00	66.00	28.00	36.00	8524 5.100
5.160	13/64	6.00	66.00	28.00	36.00	8524 5.160
5.200		6.00	66.00	28.00	36.00	8524 5.200
5.300		6.00	66.00	28.00	36.00	8524 5.300
5.400		6.00	66.00	28.00	36.00	8524 5.400
5.500		6.00	66.00	28.00	36.00	8524 5.500
5.550		6.00	66.00	28.00	36.00	8524 5.550
5.560	7/32	6.00	66.00	28.00	36.00	8524 5.560
5.600		6.00	66.00	28.00	36.00	8524 5.600
5.700		6.00	66.00	28.00	36.00	8524 5.700
5.800		6.00	66.00	28.00	36.00	8524 5.800
5.900		6.00	66.00	28.00	36.00	8524 5.900
5.950	15/64	6.00	66.00	28.00	36.00	8524 5.950
6.000		6.00	66.00	28.00	36.00	8524 6.000

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
6.100		8.00	79.00	34.00	36.00	8524 6.100
6.200		8.00	79.00	34.00	36.00	8524 6.200
6.300		8.00	79.00	34.00	36.00	8524 6.300
6.350	1/4	8.00	79.00	34.00	36.00	8524 6.350
6.400		8.00	79.00	34.00	36.00	8524 6.400
6.500		8.00	79.00	34.00	36.00	8524 6.500
6.600		8.00	79.00	34.00	36.00	8524 6.600
6.700		8.00	79.00	34.00	36.00	8524 6.700
6.750	17/64	8.00	79.00	34.00	36.00	8524 6.750
6.800		8.00	79.00	34.00	36.00	8524 6.800
6.900		8.00	79.00	34.00	36.00	8524 6.900
7.000		8.00	79.00	34.00	36.00	8524 7.000
7.100		8.00	79.00	41.00	36.00	8524 7.100
7.140	9/32	8.00	79.00	41.00	36.00	8524 7.140
7.200		8.00	79.00	41.00	36.00	8524 7.200
7.300		8.00	79.00	41.00	36.00	8524 7.300
7.400		8.00	79.00	41.00	36.00	8524 7.400
7.500		8.00	79.00	41.00	36.00	8524 7.500
7.540	19/64	8.00	79.00	41.00	36.00	8524 7.540
7.600		8.00	79.00	41.00	36.00	8524 7.600
7.700		8.00	79.00	41.00	36.00	8524 7.700
7.800		8.00	79.00	41.00	36.00	8524 7.800
7.900		8.00	79.00	41.00	36.00	8524 7.900
7.940	5/16	8.00	79.00	41.00	36.00	8524 7.940
8.000		8.00	79.00	41.00	36.00	8524 8.000
8.100		10.00	89.00	47.00	40.00	8524 8.100
8.200		10.00	89.00	47.00	40.00	8524 8.200
8.300		10.00	89.00	47.00	40.00	8524 8.300
8.330	21/64	10.00	89.00	47.00	40.00	8524 8.330
8.400		10.00	89.00	47.00	40.00	8524 8.400
8.500		10.00	89.00	47.00	40.00	8524 8.500
8.600		10.00	89.00	47.00	40.00	8524 8.600
8.700		10.00	89.00	47.00	40.00	8524 8.700
8.730	11/32	10.00	89.00	47.00	40.00	8524 8.730
8.800		10.00	89.00	47.00	40.00	8524 8.800
8.900		10.00	89.00	47.00	40.00	8524 8.900
9.000		10.00	89.00	47.00	40.00	8524 9.000
9.100		10.00	89.00	47.00	40.00	8524 9.100
9.130	23/64	10.00	89.00	47.00	40.00	8524 9.130
9.200		10.00	89.00	47.00	40.00	8524 9.200
9.250		10.00	89.00	47.00	40.00	8524 9.250
9.300		10.00	89.00	47.00	40.00	8524 9.300

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
9.400		10.00	89.00	47.00	40.00	8524 9.400
9.500		10.00	89.00	47.00	40.00	8524 9.500
9.520	3/8	10.00	89.00	47.00	40.00	8524 9.520
9.600		10.00	89.00	47.00	40.00	8524 9.600
9.700		10.00	89.00	47.00	40.00	8524 9.700
9.800		10.00	89.00	47.00	40.00	8524 9.800
9.900		10.00	89.00	47.00	40.00	8524 9.900
9.920	25/64	10.00	89.00	47.00	40.00	8524 9.920
10.000		10.00	89.00	47.00	40.00	8524 10.000
10.100		12.00	102.00	55.00	45.00	8524 10.100
10.200		12.00	102.00	55.00	45.00	8524 10.200
10.300		12.00	102.00	55.00	45.00	8524 10.300
10.320	13/32	12.00	102.00	55.00	45.00	8524 10.320
10.400		12.00	102.00	55.00	45.00	8524 10.400
10.500		12.00	102.00	55.00	45.00	8524 10.500
10.600		12.00	102.00	55.00	45.00	8524 10.600
10.700		12.00	102.00	55.00	45.00	8524 10.700
10.720	27/64	12.00	102.00	55.00	45.00	8524 10.720
10.800		12.00	102.00	55.00	45.00	8524 10.800
10.900		12.00	102.00	55.00	45.00	8524 10.900
11.000		12.00	102.00	55.00	45.00	8524 11.000
11.100		12.00	102.00	55.00	45.00	8524 11.100
11.110	7/16	12.00	102.00	55.00	45.00	8524 11.110
11.200		12.00	102.00	55.00	45.00	8524 11.200
11.300		12.00	102.00	55.00	45.00	8524 11.300
11.400		12.00	102.00	55.00	45.00	8524 11.400
11.500		12.00	102.00	55.00	45.00	8524 11.500
11.510	29/64	12.00	102.00	55.00	45.00	8524 11.510
11.600		12.00	102.00	55.00	45.00	8524 11.600
11.700		12.00	102.00	55.00	45.00	8524 11.700
11.800		12.00	102.00	55.00	45.00	8524 11.800
11.900		12.00	102.00	55.00	45.00	8524 11.900
11.910	15/32	12.00	102.00	55.00	45.00	8524 11.910
12.000		12.00	102.00	55.00	45.00	8524 12.000
12.200		14.00	107.00	60.00	45.00	8524 12.200
12.300	31/64	14.00	107.00	60.00	45.00	8524 12.300

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
12.500		14.00	107.00	60.00	45.00	8524 12.500
12.700	1/2	14.00	107.00	60.00	45.00	8524 12.700
12.800		14.00	107.00	60.00	45.00	8524 12.800
13.000		14.00	107.00	60.00	45.00	8524 13.000
13.300		14.00	107.00	60.00	45.00	8524 13.300
13.490	17/32	14.00	107.00	60.00	45.00	8524 13.490
13.500		14.00	107.00	60.00	45.00	8524 13.500
13.700		14.00	107.00	60.00	45.00	8524 13.700
14.000		14.00	107.00	60.00	45.00	8524 14.000
14.200		16.00	115.00	65.00	48.00	8524 14.200
14.290	9/16	16.00	115.00	65.00	48.00	8524 14.290
14.300		16.00	115.00	65.00	48.00	8524 14.300
14.500		16.00	115.00	65.00	48.00	8524 14.500
14.700		16.00	115.00	65.00	48.00	8524 14.700
15.000		16.00	115.00	65.00	48.00	8524 15.000
15.200		16.00	115.00	65.00	48.00	8524 15.200
15.300		16.00	115.00	65.00	48.00	8524 15.300
15.500		16.00	115.00	65.00	48.00	8524 15.500
15.700		16.00	115.00	65.00	48.00	8524 15.700
15.870	5/8	16.00	115.00	65.00	48.00	8524 15.870
16.000		16.00	115.00	65.00	48.00	8524 16.000
16.300		18.00	123.00	73.00	48.00	8524 16.300
16.500		18.00	123.00	73.00	48.00	8524 16.500
16.900		18.00	123.00	73.00	48.00	8524 16.900
17.000		18.00	123.00	73.00	48.00	8524 17.000
17.300		18.00	123.00	73.00	48.00	8524 17.300
17.500		18.00	123.00	73.00	48.00	8524 17.500
18.000		18.00	123.00	73.00	48.00	8524 18.000
18.500		20.00	131.00	79.00	50.00	8524 18.500
18.900		20.00	131.00	79.00	50.00	8524 18.900
19.000		20.00	131.00	79.00	50.00	8524 19.000
19.050	3/4	20.00	131.00	79.00	50.00	8524 19.050
19.300		20.00	131.00	79.00	50.00	8524 19.300
19.500		20.00	131.00	79.00	50.00	8524 19.500
20.000		20.00	131.00	79.00	50.00	8524 20.000

Twist drills with reinforced straight shank

3xD | H | DIN 6537 K | 120° | m7 | 65 HRC

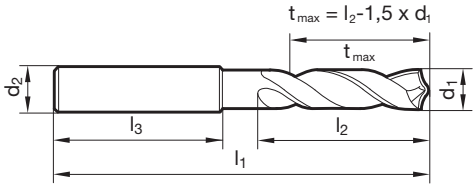
Tool material	**Solid carbide**
Surface	A
Shank form	HA

P	○
M	
K	○
N	
S	
H	•

web thinning ≥ Ø 2.600 • facet point grind • main cutting edge form straight (after correction)

GÜHRINGNAVIGATOR

Cutting data page 298





Article no. **1946**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
2.600	6.000	62.00	20.00	36.00	1946 2.600
3.000	6.000	62.00	20.00	36.00	1946 3.000
3.400	6.000	62.00	20.00	36.00	1946 3.400
4.000	6.000	66.00	24.00	36.00	1946 4.000
4.300	6.000	66.00	24.00	36.00	1946 4.300
5.000	6.000	66.00	28.00	36.00	1946 5.000
5.100	6.000	66.00	28.00	36.00	1946 5.100
5.600	6.000	66.00	28.00	36.00	1946 5.600
6.000	6.000	66.00	28.00	36.00	1946 6.000
6.900	8.000	79.00	34.00	36.00	1946 6.900
7.100	8.000	79.00	41.00	36.00	1946 7.100
8.000	8.000	79.00	41.00	36.00	1946 8.000

d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
8.600	10.000	89.00	47.00	40.00	1946 8.600
9.100	10.000	89.00	47.00	40.00	1946 9.100
10.000	10.000	89.00	47.00	40.00	1946 10.000
10.400	12.000	102.00	55.00	45.00	1946 10.400
10.600	12.000	102.00	55.00	45.00	1946 10.600
11.100	12.000	102.00	55.00	45.00	1946 11.100
12.000	12.000	102.00	55.00	45.00	1946 12.000
14.100	16.000	115.00	65.00	48.00	1946 14.100

ExclusiveLine micro-precision drills without coolant ducts

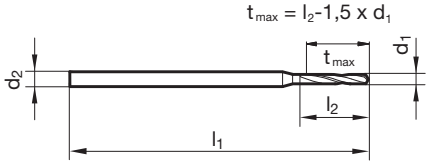


Tool material	**Solid carbide**
Surface	A
Shank form	cyl.

P	•	web thinning ≥ Ø 0.500 • facet point grind • main cutting edge form straight • edge preparation
M	•	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H		

GÜHRINGNAVIGATOR

Cutting data page 300





Article no. **6400**

d1 mm	d2 mm	l1 mm	l2 mm	Order no.
0.500	3.000	47.00	3.00	6400 0.500
0.550	3.000	47.00	3.30	6400 0.550
0.600	3.000	47.00	3.60	6400 0.600
0.650	3.000	47.00	3.90	6400 0.650
0.700	3.000	47.00	4.20	6400 0.700
0.750	3.000	47.00	4.50	6400 0.750
0.800	3.000	47.00	4.80	6400 0.800
0.850	3.000	47.00	5.10	6400 0.850
0.900	3.000	47.00	5.40	6400 0.900
0.950	3.000	47.00	5.70	6400 0.950
1.000	3.000	47.00	6.00	6400 1.000
1.050	3.000	47.00	6.30	6400 1.050
1.100	3.000	47.00	6.60	6400 1.100
1.150	3.000	47.00	6.90	6400 1.150
1.200	3.000	47.00	7.20	6400 1.200
1.250	3.000	47.00	7.50	6400 1.250
1.300	3.000	47.00	7.80	6400 1.300
1.350	3.000	47.00	8.10	6400 1.350
1.400	3.000	47.00	8.40	6400 1.400
1.450	3.000	47.00	8.70	6400 1.450
1.500	3.000	47.00	9.00	6400 1.500
1.550	3.000	47.00	9.30	6400 1.550
1.590	3.000	47.00	9.60	6400 1.590
1.600	3.000	47.00	9.60	6400 1.600
1.650	3.000	47.00	9.90	6400 1.650
1.700	3.000	47.00	10.20	6400 1.700
1.750	3.000	47.00	10.50	6400 1.750
1.800	3.000	52.00	10.80	6400 1.800
1.850	3.000	52.00	11.10	6400 1.850
1.900	3.000	52.00	11.40	6400 1.900

d1 mm	d2 mm	l1 mm	l2 mm	Order no.
1.950	3.000	52.00	11.70	6400 1.950
1.980	4.000	59.00	12.00	6400 1.980
2.000	4.000	59.00	12.00	6400 2.000
2.050	4.000	59.00	12.30	6400 2.050
2.100	4.000	59.00	12.60	6400 2.100
2.150	4.000	59.00	12.90	6400 2.150
2.200	4.000	59.00	13.20	6400 2.200
2.250	4.000	59.00	13.50	6400 2.250
2.300	4.000	59.00	13.80	6400 2.300
2.350	4.000	59.00	14.10	6400 2.350
2.380	4.000	59.00	14.40	6400 2.380
2.400	4.000	59.00	14.40	6400 2.400
2.450	4.000	59.00	14.70	6400 2.450
2.500	4.000	59.00	15.00	6400 2.500
2.550	4.000	59.00	15.30	6400 2.550
2.600	4.000	59.00	15.60	6400 2.600
2.650	4.000	59.00	15.90	6400 2.650
2.700	4.000	59.00	16.20	6400 2.700
2.750	4.000	59.00	16.50	6400 2.750
2.780	4.000	59.00	16.80	6400 2.780
2.800	4.000	59.00	16.80	6400 2.800
2.850	4.000	59.00	17.10	6400 2.850
2.900	4.000	59.00	17.40	6400 2.900
2.950	4.000	59.00	17.70	6400 2.950
3.000	4.000	59.00	18.00	6400 3.000

ExclusiveLine micro-precision drills without coolant ducts

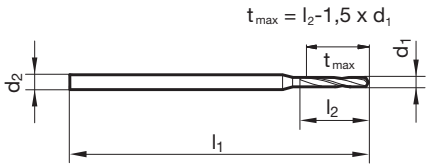
7xD | N | WN | 140° | m7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	cyl.

P	•	web thinning ≥ Ø 0.500 • facet point grind • main cutting edge form straight • edge preparation
M	•	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H		

GÜHRINGNAVIGATOR

Cutting data page 300





Article no. **6401**

d1 mm	d2 mm	l1 mm	l2 mm	Order no.
0.500	3.000	47.00	4.00	6401 0.500
0.550	3.000	47.00	4.40	6401 0.550
0.600	3.000	47.00	4.80	6401 0.600
0.650	3.000	47.00	5.20	6401 0.650
0.700	3.000	47.00	5.60	6401 0.700
0.750	3.000	47.00	6.00	6401 0.750
0.800	3.000	47.00	6.40	6401 0.800
0.850	3.000	47.00	6.80	6401 0.850
0.900	3.000	47.00	7.20	6401 0.900
0.950	3.000	47.00	7.60	6401 0.950
1.000	3.000	47.00	8.00	6401 1.000
1.050	3.000	47.00	8.40	6401 1.050
1.100	3.000	47.00	8.80	6401 1.100
1.150	3.000	47.00	9.20	6401 1.150
1.200	3.000	52.00	10.80	6401 1.200
1.250	3.000	52.00	11.30	6401 1.250
1.300	3.000	52.00	11.70	6401 1.300
1.350	3.000	52.00	12.20	6401 1.350
1.400	3.000	52.00	12.60	6401 1.400
1.450	3.000	52.00	13.10	6401 1.450
1.500	3.000	52.00	13.50	6401 1.500
1.550	3.000	52.00	14.00	6401 1.550
1.590	3.000	52.00	14.40	6401 1.590
1.600	3.000	52.00	14.40	6401 1.600
1.650	3.000	52.00	14.90	6401 1.650
1.700	3.000	52.00	15.30	6401 1.700
1.750	3.000	52.00	15.80	6401 1.750
1.800	3.000	52.00	16.20	6401 1.800
1.850	3.000	52.00	16.70	6401 1.850
1.900	3.000	52.00	17.10	6401 1.900

d1 mm	d2 mm	l1 mm	l2 mm	Order no.
1.950	3.000	52.00	17.60	6401 1.950
1.980	4.000	63.00	18.00	6401 1.980
2.000	4.000	63.00	18.00	6401 2.000
2.050	4.000	63.00	18.50	6401 2.050
2.100	4.000	63.00	18.90	6401 2.100
2.150	4.000	63.00	19.40	6401 2.150
2.200	4.000	63.00	19.80	6401 2.200
2.250	4.000	63.00	20.30	6401 2.250
2.300	4.000	63.00	20.70	6401 2.300
2.350	4.000	63.00	21.20	6401 2.350
2.380	4.000	63.00	21.60	6401 2.380
2.400	4.000	63.00	21.60	6401 2.400
2.450	4.000	63.00	22.10	6401 2.450
2.500	4.000	63.00	22.50	6401 2.500
2.550	4.000	63.00	23.00	6401 2.550
2.600	4.000	67.00	23.40	6401 2.600
2.650	4.000	67.00	23.90	6401 2.650
2.700	4.000	67.00	24.30	6401 2.700
2.750	4.000	67.00	24.80	6401 2.750
2.780	4.000	67.00	25.20	6401 2.780
2.800	4.000	67.00	25.20	6401 2.800
2.850	4.000	67.00	25.70	6401 2.850
2.900	4.000	67.00	26.10	6401 2.900
2.950	4.000	67.00	26.60	6401 2.950
3.000	4.000	67.00	27.00	6401 3.000

ExclusiveLine micro-precision drills with coolant ducts

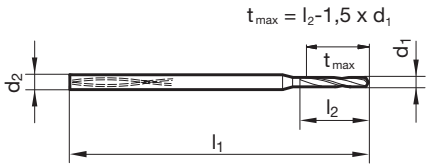
5xD | N | WN | 140° | m7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	cyl.

P	•	web thinning ≥ Ø 1.000 • facet point grind • main cutting edge form straight • with cutting lip honing
M	•	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H		

GÜHRINGNAVIGATOR

Cutting data page 300





Article no. **6405**

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.000	48.00	8.00	6405 1.000
1.020	3.000	48.00	8.50	6405 1.020
1.050	3.000	48.00	8.50	6405 1.050
1.100	3.000	48.00	9.00	6405 1.100
1.150	3.000	48.00	9.50	6405 1.150
1.180	3.000	48.00	9.50	6405 1.180
1.190	3.000	48.00	10.00	6405 1.190
1.200	3.000	48.00	10.00	6405 1.200
1.250	3.000	48.00	10.00	6405 1.250
1.280	3.000	48.00	10.50	6405 1.280
1.300	3.000	48.00	10.50	6405 1.300
1.350	3.000	48.00	11.00	6405 1.350
1.400	4.000	52.00	11.00	6405 1.400
1.450	4.000	52.00	12.00	6405 1.450
1.500	4.000	52.00	12.00	6405 1.500
1.550	4.000	52.00	12.00	6405 1.550
1.590	4.000	52.00	13.00	6405 1.590
1.600	4.000	52.00	13.00	6405 1.600
1.650	4.000	52.00	13.00	6405 1.650
1.700	4.000	56.00	14.00	6405 1.700
1.750	4.000	56.00	14.00	6405 1.750
1.800	4.000	56.00	14.00	6405 1.800
1.850	4.000	56.00	15.00	6405 1.850
1.900	4.000	56.00	15.00	6405 1.900
1.950	4.000	56.00	16.00	6405 1.950
1.980	4.000	56.00	16.00	6405 1.980
2.000	4.000	56.00	16.00	6405 2.000
2.050	4.000	56.00	16.00	6405 2.050
2.100	4.000	62.00	17.00	6405 2.100
2.150	4.000	62.00	17.00	6405 2.150

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
2.200	4.000	62.00	18.00	6405 2.200
2.250	4.000	62.00	18.00	6405 2.250
2.300	4.000	62.00	18.00	6405 2.300
2.350	4.000	62.00	19.00	6405 2.350
2.380	4.000	62.00	19.00	6405 2.380
2.400	4.000	62.00	19.00	6405 2.400
2.450	4.000	62.00	20.00	6405 2.450
2.500	4.000	62.00	20.00	6405 2.500
2.550	4.000	62.00	20.00	6405 2.550
2.600	4.000	66.00	21.00	6405 2.600
2.650	4.000	66.00	21.00	6405 2.650
2.700	4.000	66.00	22.00	6405 2.700
2.750	4.000	66.00	22.00	6405 2.750
2.780	4.000	66.00	22.00	6405 2.780
2.800	4.000	66.00	22.00	6405 2.800
2.850	4.000	66.00	23.00	6405 2.850
2.900	4.000	66.00	23.00	6405 2.900
2.950	4.000	66.00	24.00	6405 2.950
3.000	4.000	66.00	24.00	6405 3.000

ExclusiveLine micro-precision drills with coolant ducts

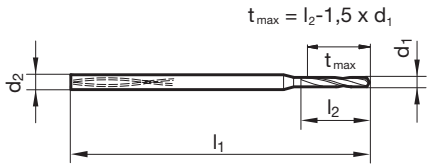
8xD | N | WN | 135° | h7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	cyl.

P	•	web thinning ≥ Ø 1.000 • facet point grind • main cutting edge form straight • with cutting lip honing
M	•	
K	•	
N	○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S	○	
H		

GÜHRINGNAVIGATOR

Cutting data page 300





Article no. **6408**

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.000	48.00	11.00	6408 1.000
1.020	3.000	48.00	11.50	6408 1.020
1.050	3.000	48.00	12.00	6408 1.050
1.100	3.000	48.00	12.50	6408 1.100
1.150	3.000	48.00	13.00	6408 1.150
1.180	3.000	48.00	13.00	6408 1.180
1.190	3.000	48.00	13.50	6408 1.190
1.200	3.000	48.00	13.50	6408 1.200
1.250	3.000	48.00	14.00	6408 1.250
1.280	3.000	48.00	14.50	6408 1.280
1.300	3.000	48.00	14.50	6408 1.300
1.350	3.000	48.00	15.00	6408 1.350
1.400	4.000	52.00	15.00	6408 1.400
1.450	4.000	52.00	16.00	6408 1.450
1.500	4.000	52.00	17.00	6408 1.500
1.550	4.000	52.00	17.00	6408 1.550
1.590	4.000	52.00	18.00	6408 1.590
1.600	4.000	52.00	18.00	6408 1.600
1.650	4.000	52.00	18.00	6408 1.650
1.700	4.000	56.00	19.00	6408 1.700
1.750	4.000	56.00	19.00	6408 1.750
1.800	4.000	56.00	20.00	6408 1.800
1.850	4.000	56.00	20.00	6408 1.850
1.900	4.000	56.00	21.00	6408 1.900
1.950	4.000	56.00	21.00	6408 1.950
1.980	4.000	56.00	22.00	6408 1.980
2.000	4.000	56.00	22.00	6408 2.000
2.050	4.000	56.00	23.00	6408 2.050
2.100	4.000	62.00	23.00	6408 2.100
2.150	4.000	62.00	24.00	6408 2.150

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
2.200	4.000	62.00	24.00	6408 2.200
2.250	4.000	62.00	25.00	6408 2.250
2.300	4.000	62.00	25.00	6408 2.300
2.320	4.000	62.00	26.00	6408 2.320
2.350	4.000	62.00	26.00	6408 2.350
2.380	4.000	62.00	26.00	6408 2.380
2.400	4.000	62.00	26.00	6408 2.400
2.450	4.000	62.00	27.00	6408 2.450
2.500	4.000	62.00	28.00	6408 2.500
2.550	4.000	62.00	28.00	6408 2.550
2.600	4.000	66.00	29.00	6408 2.600
2.650	4.000	66.00	29.00	6408 2.650
2.700	4.000	66.00	30.00	6408 2.700
2.750	4.000	66.00	30.00	6408 2.750
2.780	4.000	66.00	31.00	6408 2.780
2.800	4.000	66.00	31.00	6408 2.800
2.850	4.000	66.00	31.00	6408 2.850
2.900	4.000	66.00	32.00	6408 2.900
2.950	4.000	66.00	32.00	6408 2.950
3.000	4.000	66.00	33.00	6408 3.000

ExclusiveLine micro-precision drills with coolant ducts

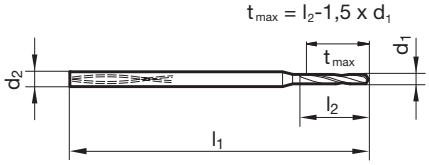
15xD | N | WN | 135° | h7 | 48 HRC

Tool material	**Solid carbide**
Surface	A
Shank form	cyl.

P •	web thinning ≥ Ø 1.000 • facet point grind • main cutting edge form straight • with cutting lip honing
M •	
K •	
N ○	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm² • stainless steels • cast materials
S ○	
H	

GÜHRINGNAVIGATOR

Cutting data page 300





Article no. **6412**

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.000	3.000	56.00	18.00	6412 1.000
1.020	3.000	56.00	18.50	6412 1.020
1.050	3.000	56.00	19.00	6412 1.050
1.100	3.000	56.00	20.00	6412 1.100
1.150	3.000	56.00	21.00	6412 1.150
1.180	3.000	56.00	21.50	6412 1.180
1.190	3.000	56.00	21.50	6412 1.190
1.200	3.000	56.00	22.00	6412 1.200
1.250	3.000	56.00	22.50	6412 1.250
1.280	3.000	56.00	23.50	6412 1.280
1.300	3.000	56.00	23.50	6412 1.300
1.350	3.000	56.00	24.50	6412 1.350
1.400	4.000	62.00	25.00	6412 1.400
1.500	4.000	62.00	27.00	6412 1.500
1.590	4.000	62.00	29.00	6412 1.590
1.600	4.000	62.00	29.00	6412 1.600
1.700	4.000	70.00	31.00	6412 1.700
1.750	4.000	70.00	32.00	6412 1.750

d1 mm	d2 h6 mm	l1 mm	l2 mm	Order no.
1.800	4.000	70.00	32.00	6412 1.800
1.900	4.000	70.00	34.00	6412 1.900
1.980	4.000	70.00	36.00	6412 1.980
2.000	4.000	70.00	36.00	6412 2.000
2.100	4.000	78.00	38.00	6412 2.100
2.200	4.000	78.00	40.00	6412 2.200
2.300	4.000	78.00	42.00	6412 2.300
2.380	4.000	78.00	44.00	6412 2.380
2.400	4.000	78.00	44.00	6412 2.400
2.500	4.000	78.00	45.00	6412 2.500
2.600	4.000	87.00	47.00	6412 2.600
2.700	4.000	87.00	48.00	6412 2.700
2.780	4.000	87.00	50.00	6412 2.780
2.800	4.000	87.00	50.00	6412 2.800
2.900	4.000	87.00	52.00	6412 2.900
3.000	4.000	87.00	54.00	6412 3.000

Tool holders for interchangeable inserts HT 800

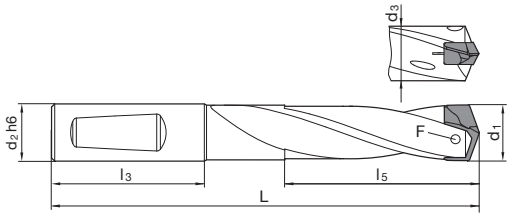
HT 800 WP | 1,5xD | WN | R

Surface	Ni
Shank form	HE

especially high wear resistance • optimised coolant duct exit • optimised flute design • nickel-plated • screwdriver art. no. 1612 included • clamping screws art. no. 4071 included

GÜHRINGNAVIGATOR

Cutting data page 308





Article no. **4106**

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
11.00-11.49	12.000	10.70	84.00	45.00	19.30	4071 2.200	4106 11.000
11.00-11.49	12.700	10.70	84.00	45.00	19.30	4071 2.200	4106 11.005
11.50-11.99	12.000	11.20	85.00	45.00	20.10	4071 2.200	4106 11.500
11.50-11.99	12.700	11.20	85.00	45.00	20.10	4071 2.200	4106 11.505
12.00-12.49	12.000	11.70	87.00	45.00	21.00	4071 2.201	4106 12.000
12.00-12.49	12.700	11.70	87.00	45.00	21.00	4071 2.201	4106 12.005
12.50-12.99	14.000	12.20	89.00	45.00	21.90	4071 2.201	4106 12.500
12.50-12.99	15.875	12.20	89.00	45.00	21.90	4071 2.201	4106 12.505
13.00-13.49	14.000	12.70	90.00	45.00	22.60	4071 2.500	4106 13.000
13.00-13.49	15.875	12.70	90.00	45.00	22.60	4071 2.500	4106 13.005
13.50-13.99	14.000	13.20	92.00	45.00	23.60	4071 2.500	4106 13.500
13.50-13.99	15.875	13.20	92.00	45.00	23.60	4071 2.500	4106 13.505
14.00-14.49	14.000	13.70	93.00	45.00	24.50	4071 3.000	4106 14.000
14.00-14.49	15.875	13.70	93.00	45.00	24.50	4071 3.000	4106 14.005
14.50-14.99	16.000	14.20	98.00	48.00	25.30	4071 3.000	4106 14.500
14.50-14.99	15.875	14.20	98.00	48.00	25.30	4071 3.000	4106 14.505
15.00-15.49	16.000	14.70	100.00	48.00	26.10	4071 3.001	4106 15.000
15.00-15.49	15.875	14.70	100.00	48.00	26.10	4071 3.001	4106 15.005
15.50-15.99	16.000	15.20	101.00	48.00	27.00	4071 3.001	4106 15.500
15.50-15.99	15.875	15.20	101.00	48.00	27.00	4071 3.001	4106 15.505
16.00-16.49	16.000	15.70	102.00	48.00	27.80	4071 3.500	4106 16.000
16.00-16.49	15.875	15.70	102.00	48.00	27.80	4071 3.500	4106 16.005
16.50-16.99	18.000	16.20	105.00	48.00	28.70	4071 3.500	4106 16.500
16.50-16.99	19.050	16.20	105.00	48.00	28.70	4071 3.500	4106 16.505
17.00-17.49	18.000	16.70	106.00	48.00	29.60	4071 3.500	4106 17.000
17.00-17.49	19.050	16.70	106.00	48.00	29.60	4071 3.500	4106 17.005
17.50-17.99	18.000	17.20	107.00	48.00	30.40	4071 3.500	4106 17.500
17.50-17.99	19.050	17.20	107.00	48.00	30.40	4071 3.500	4106 17.505
18.00-18.49	18.000	17.70	109.00	48.00	31.20	4071 4.000	4106 18.000
18.00-18.49	19.050	17.70	109.00	48.00	31.20	4071 4.000	4106 18.005
18.50-18.99	20.000	18.20	113.00	50.00	32.10	4071 4.000	4106 18.500
18.50-18.99	19.050	18.20	113.00	50.00	32.10	4071 4.000	4106 18.505
19.00-19.49	20.000	18.70	114.00	50.00	32.90	4071 4.000	4106 19.000
19.00-19.49	19.050	18.70	114.00	50.00	32.90	4071 4.000	4106 19.005
19.50-19.99	20.000	19.20	116.00	50.00	33.70	4071 4.000	4106 19.500
19.50-19.99	19.050	19.20	116.00	50.00	33.70	4071 4.000	4106 19.505
20.00-20.49	20.000	19.70	117.00	50.00	34.60	4071 4.500	4106 20.000
20.00-20.49	19.050	19.70	117.00	50.00	34.60	4071 4.500	4106 20.005
20.50-20.99	25.000	20.20	128.00	56.00	35.50	4071 4.500	4106 20.500
20.50-20.99	25.400	20.20	128.00	56.00	35.50	4071 4.500	4106 20.505
21.00-21.49	25.000	20.70	129.00	56.00	36.40	4071 4.500	4106 21.000
21.00-21.49	25.400	20.70	129.00	56.00	36.40	4071 4.500	4106 21.005

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
21.50-21.99	25.000	21.20	130.00	56.00	37.20	4071 4.500	4106 21.500
21.50-21.99	25.400	21.20	130.00	56.00	37.20	4071 4.500	4106 21.505
22.00-22.49	25.000	21.70	131.00	56.00	38.00	4071 5.000	4106 22.000
22.00-22.49	25.400	21.70	131.00	56.00	38.00	4071 5.000	4106 22.005
22.50-22.99	25.000	22.20	134.00	56.00	38.90	4071 5.000	4106 22.500
22.50-22.99	25.400	22.20	134.00	56.00	38.90	4071 5.000	4106 22.505
23.00-23.49	25.000	22.70	135.00	56.00	39.80	4071 5.000	4106 23.000
23.00-23.49	25.400	22.70	135.00	56.00	39.80	4071 5.000	4106 23.005
23.50-23.99	25.000	23.20	137.00	56.00	40.60	4071 5.000	4106 23.500
23.50-23.99	25.400	23.20	137.00	56.00	40.60	4071 5.000	4106 23.505
24.00-24.49	25.000	23.70	138.00	56.00	41.50	4071 5.001	4106 24.000
24.00-24.49	25.400	23.70	138.00	56.00	41.50	4071 5.001	4106 24.005
24.50-24.99	25.000	24.20	140.00	56.00	42.30	4071 5.001	4106 24.500
24.50-24.99	25.400	24.20	140.00	56.00	42.30	4071 5.001	4106 24.505
25.00-25.49	25.000	24.70	142.00	56.00	43.20	4071 5.001	4106 25.000
25.00-25.49	25.400	24.70	142.00	56.00	43.20	4071 5.001	4106 25.005
25.50-25.99	32.000	25.20	148.00	60.00	44.00	4071 5.001	4106 25.500
25.50-25.99	31.750	25.20	148.00	60.00	44.00	4071 5.001	4106 25.505
26.00-26.49	32.000	25.70	151.00	60.00	44.30	4071 5.003	4106 26.000
26.00-26.49	31.750	25.70	151.00	60.00	44.30	4071 5.003	4106 26.005
26.50-26.99	32.000	26.20	153.00	60.00	45.10	4071 5.003	4106 26.500
26.50-26.99	31.750	26.20	153.00	60.00	45.10	4071 5.003	4106 26.505
27.00-27.49	32.000	26.70	155.00	60.00	46.00	4071 5.003	4106 27.000
27.00-27.49	31.750	26.70	155.00	60.00	46.00	4071 5.003	4106 27.005
27.50-27.99	32.000	27.20	156.00	60.00	46.80	4071 5.003	4106 27.500
27.50-27.99	31.750	27.20	156.00	60.00	46.80	4071 5.003	4106 27.505
28.00-28.49	32.000	27.70	157.00	60.00	47.70	4071 5.003	4106 28.000
28.00-28.49	31.750	27.70	157.00	60.00	47.70	4071 5.003	4106 28.005
28.50-28.99	32.000	28.20	159.00	60.00	48.50	4071 5.003	4106 28.500
28.50-28.99	31.750	28.20	159.00	60.00	48.50	4071 5.003	4106 28.505
29.00-29.49	32.000	28.70	161.00	60.00	49.40	4071 5.003	4106 29.000
29.00-29.49	31.750	28.70	161.00	60.00	49.40	4071 5.003	4106 29.005
29.50-29.99	32.000	29.20	162.00	60.00	50.20	4071 5.003	4106 29.500
29.50-29.99	31.750	29.20	162.00	60.00	50.20	4071 5.003	4106 29.505
30.00-30.49	32.000	29.70	164.00	60.00	50.90	4071 6.000	4106 30.000
30.00-30.49	31.750	29.70	164.00	60.00	50.90	4071 6.000	4106 30.005
30.50-30.99	32.000	30.20	166.00	60.00	51.70	4071 6.000	4106 30.500
30.50-30.99	31.750	30.20	166.00	60.00	51.70	4071 6.000	4106 30.505
31.00-31.49	32.000	30.70	167.00	60.00	52.60	4071 6.000	4106 31.000
31.00-31.49	31.750	30.70	167.00	60.00	52.60	4071 6.000	4106 31.005
31.50-31.99	32.000	31.20	168.00	60.00	53.40	4071 6.000	4106 31.500
31.50-31.99	31.750	31.20	168.00	60.00	53.40	4071 6.000	4106 31.505
32.00-32.99	32.000	31.70	172.00	60.00	55.10	4071 6.001	4106 32.000
32.00-32.99	31.750	31.70	172.00	60.00	55.10	4071 6.001	4106 32.005
33.00-33.99	32.000	32.70	175.00	60.00	56.80	4071 6.001	4106 33.000
33.00-33.99	31.750	32.70	175.00	60.00	56.80	4071 6.001	4106 33.005
34.00-34.99	32.000	33.70	178.00	60.00	58.50	4071 6.001	4106 34.000
34.00-34.99	31.750	33.70	178.00	60.00	58.50	4071 6.001	4106 34.005
35.00-35.99	32.000	34.70	181.00	60.00	60.20	4071 6.001	4106 35.000
35.00-35.99	31.750	34.70	181.00	60.00	60.20	4071 6.001	4106 35.005
36.00-36.99	32.000	35.70	184.00	60.00	61.80	4071 6.002	4106 36.000
36.00-36.99	31.750	35.70	184.00	60.00	61.80	4071 6.002	4106 36.005
37.00-37.99	32.000	36.70	188.00	60.00	63.50	4071 6.002	4106 37.000
37.00-37.99	31.750	36.70	188.00	60.00	63.50	4071 6.002	4106 37.005
38.00-38.99	32.000	37.70	191.00	60.00	65.20	4071 6.002	4106 38.000
38.00-38.99	31.750	37.70	191.00	60.00	65.20	4071 6.002	4106 38.005
39.00-40.00	32.000	38.70	194.00	60.00	66.90	4071 6.002	4106 39.000
39.00-40.00	31.750	38.70	194.00	60.00	66.90	4071 6.002	4106 39.005

Tool holders for interchangeable inserts HT 800

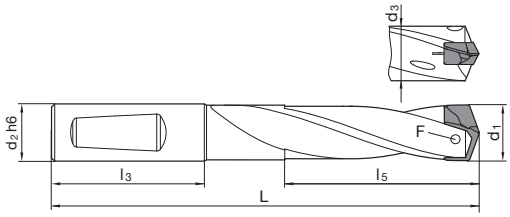
HT 800 WP | 3xD | WN | R

Surface	Ni
Shank form	HE

especially high wear resistance • optimised coolant duct exit • optimised flute design • nickel-plated • screwdriver art. no. 1612 included • clamping screws art. no. 4071 included

GÜHRINGNAVIGATOR

Cutting data page 308





Article no. **4107**

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
11.00-11.49	12.000	10.70	101.00	45.00	36.60	4071 2.200	4107 11.000
11.00-11.49	12.700	10.70	101.00	45.00	36.60	4071 2.200	4107 11.005
11.50-11.99	12.000	11.20	103.00	45.00	38.10	4071 2.200	4107 11.500
11.50-11.99	12.700	11.20	103.00	45.00	38.10	4071 2.200	4107 11.505
12.00-12.49	12.000	11.70	106.00	45.00	39.70	4071 2.201	4107 12.000
12.00-12.49	12.700	11.70	106.00	45.00	39.70	4071 2.201	4107 12.005
12.50-12.99	14.000	12.20	108.00	45.00	41.30	4071 2.201	4107 12.500
12.50-12.99	15.875	12.20	108.00	45.00	41.30	4071 2.201	4107 12.505
13.00-13.49	14.000	12.70	110.00	45.00	42.90	4071 2.500	4107 13.000
13.00-13.49	15.875	12.70	110.00	45.00	42.90	4071 2.500	4107 13.005
13.50-13.99	14.000	13.20	113.00	45.00	44.60	4071 2.500	4107 13.500
13.50-13.99	15.875	13.20	113.00	45.00	44.60	4071 2.500	4107 13.505
14.00-14.49	14.000	13.70	115.00	45.00	46.20	4071 3.000	4107 14.000
14.00-14.49	15.875	13.70	115.00	45.00	46.20	4071 3.000	4107 14.005
14.50-14.99	16.000	14.20	120.00	48.00	47.80	4071 3.000	4107 14.500
14.50-14.99	15.875	14.20	120.00	48.00	47.80	4071 3.000	4107 14.505
15.00-15.49	16.000	14.70	123.00	48.00	49.30	4071 3.001	4107 15.000
15.00-15.49	15.875	14.70	123.00	48.00	49.30	4071 3.001	4107 15.005
15.50-15.99	16.000	15.20	125.00	48.00	50.90	4071 3.001	4107 15.500
15.50-15.99	15.875	15.20	125.00	48.00	50.90	4071 3.001	4107 15.505
16.00-16.49	16.000	15.70	127.00	48.00	52.90	4071 3.500	4107 16.000
16.00-16.49	15.875	15.70	127.00	48.00	52.90	4071 3.500	4107 16.005
16.50-16.99	18.000	16.20	130.00	48.00	54.10	4071 3.500	4107 16.500
16.50-16.99	19.050	16.20	130.00	48.00	54.10	4071 3.500	4107 16.505
17.00-17.49	18.000	16.70	132.00	48.00	55.80	4071 3.500	4107 17.000
17.00-17.49	19.050	16.70	132.00	48.00	55.80	4071 3.500	4107 17.005
17.50-17.99	18.000	17.20	134.00	48.00	57.40	4071 3.500	4107 17.500
17.50-17.99	19.050	17.20	134.00	48.00	57.40	4071 3.500	4107 17.505
18.00-18.49	18.000	17.70	137.00	48.00	58.90	4071 4.000	4107 18.000
18.00-18.49	19.050	17.70	137.00	48.00	58.90	4071 4.000	4107 18.005
18.50-18.99	20.000	18.20	141.00	50.00	60.50	4071 4.000	4107 18.500
18.50-18.99	19.050	18.20	141.00	50.00	60.50	4071 4.000	4107 18.505
19.00-19.49	20.000	18.70	143.00	50.00	62.10	4071 4.000	4107 19.000
19.00-19.49	19.050	18.70	143.00	50.00	62.10	4071 4.000	4107 19.005
19.50-19.99	20.000	19.20	146.00	50.00	63.70	4071 4.000	4107 19.500
19.50-19.99	19.050	19.20	146.00	50.00	63.70	4071 4.000	4107 19.505
20.00-20.49	20.000	19.70	148.00	50.00	65.30	4071 4.500	4107 20.000
20.00-20.49	19.050	19.70	148.00	50.00	65.30	4071 4.500	4107 20.005
20.50-20.99	25.000	20.20	159.00	56.00	67.00	4071 4.500	4107 20.500
20.50-20.99	25.400	20.20	159.00	56.00	67.00	4071 4.500	4107 20.505
21.00-21.49	25.000	20.70	161.00	56.00	68.60	4071 4.500	4107 21.000
21.00-21.49	25.400	20.70	161.00	56.00	68.60	4071 4.500	4107 21.005

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
21.50-21.99	25.000	21.20	163.00	56.00	70.10	4071 4.500	4107 21.500
21.50-21.99	25.400	21.20	163.00	56.00	70.10	4071 4.500	4107 21.505
22.00-22.49	25.000	21.70	165.00	56.00	71.70	4071 5.000	4107 22.000
22.00-22.49	25.400	21.70	165.00	56.00	71.70	4071 5.000	4107 22.005
22.50-22.99	25.000	22.20	168.00	56.00	73.30	4071 5.000	4107 22.500
22.50-22.99	25.400	22.20	168.00	56.00	73.30	4071 5.000	4107 22.505
23.00-23.49	25.000	22.70	170.00	56.00	74.90	4071 5.000	4107 23.000
23.00-23.49	25.400	22.70	170.00	56.00	74.90	4071 5.000	4107 23.005
23.50-23.99	25.000	23.20	173.00	56.00	76.50	4071 5.000	4107 23.500
23.50-23.99	25.400	23.20	173.00	56.00	76.50	4071 5.000	4107 23.505
24.00-24.49	25.000	23.70	175.00	56.00	78.10	4071 5.001	4107 24.000
24.00-24.49	25.400	23.70	175.00	56.00	78.10	4071 5.001	4107 24.005
24.50-24.99	25.000	24.20	177.00	56.00	79.70	4071 5.001	4107 24.500
24.50-24.99	25.400	24.20	177.00	56.00	79.70	4071 5.001	4107 24.505
25.00-25.49	25.000	24.70	180.00	56.00	81.30	4071 5.001	4107 25.000
25.00-25.49	25.400	24.70	180.00	56.00	81.30	4071 5.001	4107 25.005
25.50-25.99	32.000	25.20	187.00	60.00	82.90	4071 5.001	4107 25.500
25.50-25.99	31.750	25.20	187.00	60.00	82.90	4071 5.001	4107 25.505
26.00-26.49	32.000	25.70	191.00	60.00	84.00	4071 5.003	4107 26.000
26.00-26.49	31.750	25.70	191.00	60.00	84.00	4071 5.003	4107 26.005
26.50-26.99	32.000	26.20	193.00	60.00	86.10	4071 5.003	4107 26.500
26.50-26.99	31.750	26.20	193.00	60.00	86.10	4071 5.003	4107 26.505
27.00-27.49	32.000	26.70	196.00	60.00	87.20	4071 5.003	4107 27.000
27.00-27.49	31.750	26.70	196.00	60.00	87.20	4071 5.003	4107 27.005
27.50-27.99	32.000	27.20	198.00	60.00	88.90	4071 5.003	4107 27.500
27.50-27.99	31.750	27.20	198.00	60.00	88.90	4071 5.003	4107 27.505
28.00-28.49	32.000	27.70	200.00	60.00	90.40	4071 5.003	4107 28.000
28.00-28.49	31.750	27.70	200.00	60.00	90.40	4071 5.003	4107 28.005
28.50-28.99	32.000	28.20	202.00	60.00	92.50	4071 5.003	4107 28.500
28.50-28.99	31.750	28.20	202.00	60.00	92.50	4071 5.003	4107 28.505
29.00-29.49	32.000	28.70	205.00	60.00	94.60	4071 5.003	4107 29.000
29.00-29.49	31.750	28.70	205.00	60.00	94.60	4071 5.003	4107 29.005
29.50-29.99	32.000	29.20	207.00	60.00	95.10	4071 5.003	4107 29.500
29.50-29.99	31.750	29.20	207.00	60.00	95.10	4071 5.003	4107 29.505
30.00-30.49	32.000	29.70	210.00	60.00	96.70	4071 6.000	4107 30.000
30.00-30.49	31.750	29.70	210.00	60.00	96.70	4071 6.000	4107 30.005
30.50-30.99	32.000	30.20	212.00	60.00	98.30	4071 6.000	4107 30.500
30.50-30.99	31.750	30.20	212.00	60.00	98.30	4071 6.000	4107 30.505
31.00-31.49	32.000	30.70	214.00	60.00	99.80	4071 6.000	4107 31.000
31.00-31.49	31.750	30.70	214.00	60.00	99.80	4071 6.000	4107 31.005
31.50-31.99	32.000	31.20	216.00	60.00	101.40	4071 6.000	4107 31.500
31.50-31.99	31.750	31.20	216.00	60.00	101.40	4071 6.000	4107 31.505
32.00-32.99	32.000	31.70	221.00	60.00	104.60	4071 6.001	4107 32.000
32.00-32.99	31.750	31.70	221.00	60.00	104.60	4071 6.001	4107 32.005
33.00-33.99	32.000	32.70	226.00	60.00	107.80	4071 6.001	4107 33.000
33.00-33.99	31.750	32.70	226.00	60.00	107.80	4071 6.001	4107 33.005
34.00-34.99	32.000	33.70	230.00	60.00	111.00	4071 6.001	4107 34.000
34.00-34.99	31.750	33.70	230.00	60.00	111.00	4071 6.001	4107 34.005
35.00-35.99	32.000	34.70	235.00	60.00	114.20	4071 6.001	4107 35.000
35.00-35.99	31.750	34.70	235.00	60.00	114.20	4071 6.001	4107 35.005
36.00-36.99	32.000	35.70	240.00	60.00	117.30	4071 6.002	4107 36.000
36.00-36.99	31.750	35.70	240.00	60.00	117.30	4071 6.002	4107 36.005
37.00-37.99	32.000	36.70	245.00	60.00	120.50	4071 6.002	4107 37.000
37.00-37.99	31.750	36.70	245.00	60.00	120.50	4071 6.002	4107 37.005
38.00-38.99	32.000	37.70	249.00	60.00	123.70	4071 6.002	4107 38.000
38.00-38.99	31.750	37.70	249.00	60.00	123.70	4071 6.002	4107 38.005
39.00-40.00	32.000	38.70	254.00	60.00	126.90	4071 6.002	4107 39.000
39.00-40.00	31.750	38.70	254.00	60.00	126.90	4071 6.002	4107 39.005

Tool holders for interchangeable inserts HT 800

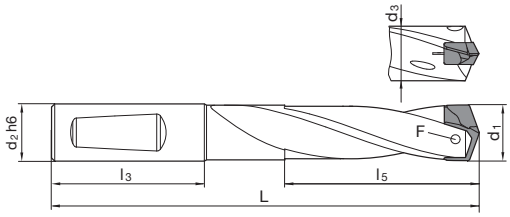
HT 800 WP | 5xD | WN | R

Surface	Ni
Shank form	HE

especially high wear resistance • optimised coolant duct exit • optimised flute design • nickel-plated • screwdriver art. no. 1612 included • clamping screws art. no. 4071 included

GÜHRINGNAVIGATOR

Cutting data page 310





Article no. **4108**

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
11.00-11.49	12.000	10.70	124.00	45.00	59.60	4071 2.200	4108 11.000
11.00-11.49	12.700	10.70	124.00	45.00	59.60	4071 2.200	4108 11.005
11.50-11.99	12.000	11.20	127.00	45.00	62.10	4071 2.200	4108 11.500
11.50-11.99	12.700	11.20	127.00	45.00	62.10	4071 2.200	4108 11.505
12.00-12.49	12.000	11.70	131.00	45.00	64.70	4071 2.201	4108 12.000
12.00-12.49	12.700	11.70	131.00	45.00	64.70	4071 2.201	4108 12.005
12.50-12.99	14.000	12.20	134.00	45.00	67.30	4071 2.201	4108 12.500
12.50-12.99	15.875	12.20	134.00	45.00	67.30	4071 2.201	4108 12.505
13.00-13.49	14.000	12.70	137.00	45.00	69.90	4071 2.500	4108 13.000
13.00-13.49	15.875	12.70	137.00	45.00	69.90	4071 2.500	4108 13.005
13.50-13.99	14.000	13.20	141.00	45.00	72.60	4071 2.500	4108 13.500
13.50-13.99	15.875	13.20	141.00	45.00	72.60	4071 2.500	4108 13.505
14.00-14.49	14.000	13.70	144.00	45.00	75.20	4071 3.000	4108 14.000
14.00-14.49	15.875	13.70	144.00	45.00	75.20	4071 3.000	4108 14.005
14.50-14.99	16.000	14.20	150.00	48.00	77.80	4071 3.000	4108 14.500
14.50-14.99	15.875	14.20	150.00	48.00	77.80	4071 3.000	4108 14.505
15.00-15.49	16.000	14.70	154.00	48.00	80.30	4071 3.001	4108 15.000
15.00-15.49	15.875	14.70	154.00	48.00	80.30	4071 3.001	4108 15.005
15.50-15.99	16.000	15.20	157.00	48.00	82.90	4071 3.001	4108 15.500
15.50-15.99	15.875	15.20	157.00	48.00	82.90	4071 3.001	4108 15.505
16.00-16.49	16.000	15.70	160.00	48.00	85.90	4071 3.500	4108 16.000
16.00-16.49	15.875	15.70	160.00	48.00	85.90	4071 3.500	4108 16.005
16.50-16.99	18.000	16.20	164.00	48.00	88.10	4071 3.500	4108 16.500
16.50-16.99	19.050	16.20	164.00	48.00	88.10	4071 3.500	4108 16.505
17.00-17.49	18.000	16.70	167.00	48.00	90.80	4071 3.500	4108 17.000
17.00-17.49	19.050	16.70	167.00	48.00	90.80	4071 3.500	4108 17.005
17.50-17.99	18.000	17.20	170.00	48.00	93.40	4071 3.500	4108 17.500
17.50-17.99	19.050	17.20	170.00	48.00	93.40	4071 3.500	4108 17.505
18.00-18.49	18.000	17.70	174.00	48.00	95.90	4071 4.000	4108 18.000
18.00-18.49	19.050	17.70	174.00	48.00	95.90	4071 4.000	4108 18.005
18.50-18.99	20.000	18.20	179.00	50.00	98.50	4071 4.000	4108 18.500
18.50-18.99	19.050	18.20	179.00	50.00	98.50	4071 4.000	4108 18.505
19.00-19.49	20.000	18.70	182.00	50.00	101.10	4071 4.000	4108 19.000
19.00-19.49	19.050	18.70	182.00	50.00	101.10	4071 4.000	4108 19.005
19.50-19.99	20.000	19.20	186.00	50.00	103.70	4071 4.000	4108 19.500
19.50-19.99	19.050	19.20	186.00	50.00	103.70	4071 4.000	4108 19.505
20.00-20.49	20.000	19.70	189.00	50.00	106.30	4071 4.500	4108 20.000
20.00-20.49	19.050	19.70	189.00	50.00	106.30	4071 4.500	4108 20.005
20.50-20.99	25.000	20.20	201.00	56.00	109.00	4071 4.500	4108 20.500
20.50-20.99	25.400	20.20	201.00	56.00	109.00	4071 4.500	4108 20.505
21.00-21.49	25.000	20.70	204.00	56.00	111.60	4071 4.500	4108 21.000
21.00-21.49	25.400	20.70	204.00	56.00	111.60	4071 4.500	4108 21.005

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
21.50-21.99	25.000	21.20	207.00	56.00	114.10	4071 4.500	4108 21.500
21.50-21.99	25.400	21.20	207.00	56.00	114.10	4071 4.500	4108 21.505
22.00-22.49	25.000	21.70	210.00	56.00	116.70	4071 5.000	4108 22.000
22.00-22.49	25.400	21.70	210.00	56.00	116.70	4071 5.000	4108 22.005
22.50-22.99	25.000	22.20	214.00	56.00	119.30	4071 5.000	4108 22.500
22.50-22.99	25.400	22.20	214.00	56.00	119.30	4071 5.000	4108 22.505
23.00-23.49	25.000	22.70	217.00	56.00	121.90	4071 5.000	4108 23.000
23.00-23.49	25.400	22.70	217.00	56.00	121.90	4071 5.000	4108 23.005
23.50-23.99	25.000	23.20	221.00	56.00	124.50	4071 5.000	4108 23.500
23.50-23.99	25.400	23.20	221.00	56.00	124.50	4071 5.000	4108 23.505
24.00-24.49	25.000	23.70	224.00	56.00	127.10	4071 5.001	4108 24.000
24.00-24.49	25.400	23.70	224.00	56.00	127.10	4071 5.001	4108 24.005
24.50-24.99	25.000	24.20	227.00	56.00	129.70	4071 5.001	4108 24.500
24.50-24.99	25.400	24.20	227.00	56.00	129.70	4071 5.001	4108 24.505
25.00-25.49	25.000	24.70	231.00	56.00	132.30	4071 5.001	4108 25.000
25.00-25.49	25.400	24.70	231.00	56.00	132.30	4071 5.001	4108 25.005
25.50-25.99	32.000	25.20	239.00	60.00	134.90	4071 5.001	4108 25.500
25.50-25.99	31.750	25.20	239.00	60.00	134.90	4071 5.001	4108 25.505
26.00-26.49	32.000	25.70	244.00	60.00	137.00	4071 5.003	4108 26.000
26.00-26.49	31.750	25.70	244.00	60.00	137.00	4071 5.003	4108 26.005
26.50-26.99	32.000	26.20	247.00	60.00	140.00	4071 5.003	4108 26.500
26.50-26.99	31.750	26.20	247.00	60.00	140.00	4071 5.003	4108 26.505
27.00-27.49	32.000	26.70	251.00	60.00	142.20	4071 5.003	4108 27.000
27.00-27.49	31.750	26.70	251.00	60.00	142.20	4071 5.003	4108 27.005
27.50-27.99	32.000	27.20	254.00	60.00	144.80	4071 5.003	4108 27.500
27.50-27.99	31.750	27.20	254.00	60.00	144.80	4071 5.003	4108 27.505
28.00-28.49	32.000	27.70	257.00	60.00	147.40	4071 5.003	4108 28.000
28.00-28.49	31.750	27.70	257.00	60.00	147.40	4071 5.003	4108 28.005
28.50-28.99	32.000	28.20	260.00	60.00	150.40	4071 5.003	4108 28.500
28.50-28.99	31.750	28.20	260.00	60.00	150.40	4071 5.003	4108 28.505
29.00-29.49	32.000	28.70	264.00	60.00	153.50	4071 5.003	4108 29.000
29.00-29.49	31.750	28.70	264.00	60.00	153.50	4071 5.003	4108 29.005
29.50-29.99	32.000	29.20	267.00	60.00	155.10	4071 5.003	4108 29.500
29.50-29.99	31.750	29.20	267.00	60.00	155.10	4071 5.003	4108 29.505
30.00-30.49	32.000	29.70	271.00	60.00	157.60	4071 6.000	4108 30.000
30.00-30.49	31.750	29.70	271.00	60.00	157.60	4071 6.000	4108 30.005
30.50-30.99	32.000	30.20	274.00	60.00	160.20	4071 6.000	4108 30.500
30.50-30.99	31.750	30.20	274.00	60.00	160.20	4071 6.000	4108 30.505
31.00-31.49	32.000	30.70	277.00	60.00	162.80	4071 6.000	4108 31.000
31.00-31.49	31.750	30.70	277.00	60.00	162.80	4071 6.000	4108 31.005
31.50-31.99	32.000	31.20	280.00	60.00	165.40	4071 6.000	4108 31.500
31.50-31.99	31.750	31.20	280.00	60.00	165.40	4071 6.000	4108 31.505
32.00-32.99	32.000	31.70	287.00	60.00	170.60	4071 6.001	4108 32.000
32.00-32.99	31.750	31.70	287.00	60.00	170.60	4071 6.001	4108 32.005
33.00-33.99	32.000	32.70	294.00	60.00	175.80	4071 6.001	4108 33.000
33.00-33.99	31.750	32.70	294.00	60.00	175.80	4071 6.001	4108 33.005
34.00-34.99	32.000	33.70	300.00	60.00	181.00	4071 6.001	4108 34.000
34.00-34.99	31.750	33.70	300.00	60.00	181.00	4071 6.001	4108 34.005
35.00-35.99	32.000	34.70	307.00	60.00	186.20	4071 6.001	4108 35.000
35.00-35.99	31.750	34.70	307.00	60.00	186.20	4071 6.001	4108 35.005
36.00-36.99	32.000	35.70	314.00	60.00	191.30	4071 6.002	4108 36.000
36.00-36.99	31.750	35.70	314.00	60.00	191.30	4071 6.002	4108 36.005
37.00-37.99	32.000	36.70	321.00	60.00	196.50	4071 6.002	4108 37.000
37.00-37.99	31.750	36.70	321.00	60.00	196.50	4071 6.002	4108 37.005
38.00-38.99	32.000	37.70	327.00	60.00	201.70	4071 6.002	4108 38.000
38.00-38.99	31.750	37.70	327.00	60.00	201.70	4071 6.002	4108 38.005
39.00-40.00	32.000	38.70	334.00	60.00	206.90	4071 6.002	4108 39.000
39.00-40.00	31.750	38.70	334.00	60.00	206.90	4071 6.002	4108 39.005

Tool holders for interchangeable inserts HT 800

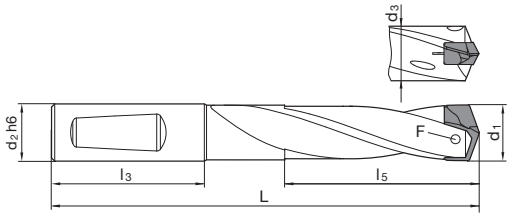
HT 800 WP | 7xD | WN | R

Surface	Ni
Shank form	HE

especially high wear resistance • optimised coolant duct exit • optimised flute design • nickel-plated • screwdriver art. no. 1612 included • clamping screws art. no. 4071 included

GÜHRINGNAVIGATOR

Cutting data page 310





Article no. **4109**

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
11.00-11.49	12.000	10.70	147.00	45.00	82.60	4071 2.200	4109 11.000
11.00-11.49	12.700	10.70	147.00	45.00	82.60	4071 2.200	4109 11.005
11.50-11.99	12.000	11.20	151.00	45.00	86.10	4071 2.200	4109 11.500
11.50-11.99	12.700	11.20	151.00	45.00	86.10	4071 2.200	4109 11.505
12.00-12.49	12.000	11.70	156.00	45.00	89.70	4071 2.201	4109 12.000
12.00-12.49	12.700	11.70	156.00	45.00	89.70	4071 2.201	4109 12.005
12.50-12.99	14.000	12.20	160.00	45.00	93.30	4071 2.201	4109 12.500
12.50-12.99	15.875	12.20	160.00	45.00	93.30	4071 2.201	4109 12.505
13.00-13.49	14.000	12.70	164.00	45.00	96.90	4071 2.500	4109 13.000
13.00-13.49	15.875	12.70	164.00	45.00	96.90	4071 2.500	4109 13.005
13.50-13.99	14.000	13.20	169.00	45.00	100.60	4071 2.500	4109 13.500
13.50-13.99	15.875	13.20	169.00	45.00	100.60	4071 2.500	4109 13.505
14.00-14.49	14.000	13.70	173.00	45.00	104.20	4071 3.000	4109 14.000
14.00-14.49	15.875	13.70	173.00	45.00	104.20	4071 3.000	4109 14.005
14.50-14.99	16.000	14.20	180.00	48.00	107.80	4071 3.000	4109 14.500
14.50-14.99	15.875	14.20	180.00	48.00	107.80	4071 3.000	4109 14.505
15.00-15.49	16.000	14.70	185.00	48.00	111.30	4071 3.001	4109 15.000
15.00-15.49	15.875	14.70	185.00	48.00	111.30	4071 3.001	4109 15.005
15.50-15.99	16.000	15.20	189.00	48.00	114.90	4071 3.001	4109 15.500
15.50-15.99	15.875	15.20	189.00	48.00	114.90	4071 3.001	4109 15.505
16.00-16.49	16.000	15.70	193.00	48.00	118.90	4071 3.500	4109 16.000
16.00-16.49	15.875	15.70	193.00	48.00	118.90	4071 3.500	4109 16.005
16.50-16.99	18.000	16.20	198.00	48.00	122.10	4071 3.500	4109 16.500
16.50-16.99	19.050	16.20	198.00	48.00	122.10	4071 3.500	4109 16.505
17.00-17.49	18.000	16.70	202.00	48.00	125.80	4071 3.500	4109 17.000
17.00-17.49	19.050	16.70	202.00	48.00	125.80	4071 3.500	4109 17.005
17.50-17.99	18.000	17.20	206.00	48.00	129.40	4071 3.500	4109 17.500
17.50-17.99	19.050	17.20	206.00	48.00	129.40	4071 3.500	4109 17.505
18.00-18.49	18.000	17.70	211.00	48.00	132.90	4071 4.000	4109 18.000
18.00-18.49	19.050	17.70	211.00	48.00	132.90	4071 4.000	4109 18.005
18.50-18.99	20.000	18.20	217.00	50.00	136.50	4071 4.000	4109 18.500
18.50-18.99	19.050	18.20	217.00	50.00	136.50	4071 4.000	4109 18.505
19.00-19.49	20.000	18.70	221.00	50.00	140.10	4071 4.000	4109 19.000
19.00-19.49	19.050	18.70	221.00	50.00	140.10	4071 4.000	4109 19.005
19.50-19.99	20.000	19.20	226.00	50.00	143.70	4071 4.000	4109 19.500
19.50-19.99	19.050	19.20	226.00	50.00	143.70	4071 4.000	4109 19.505
20.00-20.49	20.000	19.70	230.00	50.00	147.30	4071 4.500	4109 20.000
20.00-20.49	19.050	19.70	230.00	50.00	147.30	4071 4.500	4109 20.005
20.50-20.99	25.000	20.20	243.00	56.00	151.00	4071 4.500	4109 20.500
20.50-20.99	25.400	20.20	243.00	56.00	151.00	4071 4.500	4109 20.505
21.00-21.49	25.000	20.70	247.00	56.00	154.60	4071 4.500	4109 21.000
21.00-21.49	25.400	20.70	247.00	56.00	154.60	4071 4.500	4109 21.005

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
21.50-21.99	25.000	21.20	251.00	56.00	158.10	4071 4.500	4109 21.500
21.50-21.99	25.400	21.20	251.00	56.00	158.10	4071 4.500	4109 21.505
22.00-22.49	25.000	21.70	255.00	56.00	161.70	4071 5.000	4109 22.000
22.00-22.49	25.400	21.70	255.00	56.00	161.70	4071 5.000	4109 22.005
22.50-22.99	25.000	22.20	260.00	56.00	165.30	4071 5.000	4109 22.500
22.50-22.99	25.400	22.20	260.00	56.00	165.30	4071 5.000	4109 22.505
23.00-23.49	25.000	22.70	264.00	56.00	168.90	4071 5.000	4109 23.000
23.00-23.49	25.400	22.70	264.00	56.00	168.90	4071 5.000	4109 23.005
23.50-23.99	25.000	23.20	269.00	56.00	172.50	4071 5.000	4109 23.500
23.50-23.99	25.400	23.20	269.00	56.00	172.50	4071 5.000	4109 23.505
24.00-24.49	25.000	23.70	273.00	56.00	176.10	4071 5.001	4109 24.000
24.00-24.49	25.400	23.70	273.00	56.00	176.10	4071 5.001	4109 24.005
24.50-24.99	25.000	24.20	277.00	56.00	179.70	4071 5.001	4109 24.500
24.50-24.99	25.400	24.20	277.00	56.00	179.70	4071 5.001	4109 24.505
25.00-25.49	25.000	24.70	282.00	56.00	183.30	4071 5.001	4109 25.000
25.00-25.49	25.400	24.70	282.00	56.00	183.30	4071 5.001	4109 25.005
25.50-25.99	32.000	25.20	291.00	60.00	186.90	4071 5.001	4109 25.500
25.50-25.99	31.750	25.20	291.00	60.00	186.90	4071 5.001	4109 25.505
26.00-26.49	32.000	25.70	297.00	60.00	190.00	4071 5.003	4109 26.000
26.00-26.49	31.750	25.70	297.00	60.00	190.00	4071 5.003	4109 26.005
26.50-26.99	32.000	26.20	301.00	60.00	194.00	4071 5.003	4109 26.500
26.50-26.99	31.750	26.20	301.00	60.00	194.00	4071 5.003	4109 26.505
27.00-27.49	32.000	26.70	306.00	60.00	197.20	4071 5.003	4109 27.000
27.00-27.49	31.750	26.70	306.00	60.00	197.20	4071 5.003	4109 27.005
27.50-27.99	32.000	27.20	310.00	60.00	200.80	4071 5.003	4109 27.500
27.50-27.99	31.750	27.20	310.00	60.00	200.80	4071 5.003	4109 27.505
28.00-28.49	32.000	27.70	314.00	60.00	204.40	4071 5.003	4109 28.000
28.00-28.49	31.750	27.70	314.00	60.00	204.40	4071 5.003	4109 28.005
28.50-28.99	32.000	28.20	318.00	60.00	208.40	4071 5.003	4109 28.500
28.50-28.99	31.750	28.20	318.00	60.00	208.40	4071 5.003	4109 28.505
29.00-29.49	32.000	28.70	323.00	60.00	212.50	4071 5.003	4109 29.000
29.00-29.49	31.750	28.70	323.00	60.00	212.50	4071 5.003	4109 29.005
29.50-29.99	32.000	29.20	327.00	60.00	215.10	4071 5.003	4109 29.500
29.50-29.99	31.750	29.20	327.00	60.00	215.10	4071 5.003	4109 29.505
30.00-30.49	32.000	29.70	332.00	60.00	218.60	4071 6.000	4109 30.000
30.00-30.49	31.750	29.70	332.00	60.00	218.60	4071 6.000	4109 30.005
30.50-30.99	32.000	30.20	336.00	60.00	222.20	4071 6.000	4109 30.500
30.50-30.99	31.750	30.20	336.00	60.00	222.20	4071 6.000	4109 30.505
31.00-31.49	32.000	30.70	340.00	60.00	225.80	4071 6.000	4109 31.000
31.00-31.49	31.750	30.70	340.00	60.00	225.80	4071 6.000	4109 31.005
31.50-31.99	32.000	31.20	344.00	60.00	229.40	4071 6.000	4109 31.500
31.50-31.99	31.750	31.20	344.00	60.00	229.40	4071 6.000	4109 31.505
33.00-33.99	32.000	32.70	362.00	60.00	244.60	4071 6.001	4109 33.000
36.00-36.99	32.000	35.70	387.00	60.00	265.80	4071 6.002	4109 36.000
39.00-40.00	32.000	38.70	413.00	60.00	287.40	4071 6.002	4109 39.000

Tool holders for interchangeable inserts HT 800

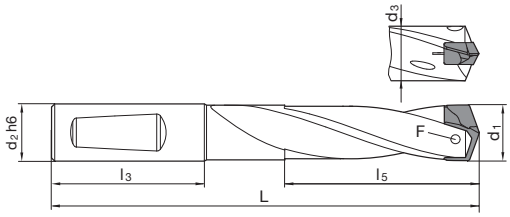
HT 800 WP | 10xD | WN | R

Surface	Ni
Shank form	HE

especially high wear resistance • optimised coolant duct exit • optimised flute design • nickel-plated • screwdriver art. no. 1612 included • clamping screws art. no. 4071 included

GÜHRINGNAVIGATOR

Cutting data page 312





Article no. **4110**

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
11.00-11.49	12.000	10.70	182.00	45.00	117.10	4071 2.200	4110 11.000
11.00-11.49	12.700	10.70	182.00	45.00	117.10	4071 2.200	4110 11.005
11.50-11.99	12.000	11.20	187.00	45.00	122.10	4071 2.200	4110 11.500
11.50-11.99	12.700	11.20	187.00	45.00	122.10	4071 2.200	4110 11.505
12.00-12.49	12.000	11.70	194.00	45.00	127.20	4071 2.201	4110 12.000
12.00-12.49	12.700	11.70	194.00	45.00	127.20	4071 2.201	4110 12.005
12.50-12.99	14.000	12.20	199.00	45.00	132.30	4071 2.201	4110 12.500
12.50-12.99	15.875	12.20	199.00	45.00	132.30	4071 2.201	4110 12.505
13.00-13.49	14.000	12.70	205.00	45.00	137.50	4071 2.500	4110 13.000
13.00-13.49	15.875	12.70	205.00	45.00	137.50	4071 2.500	4110 13.005
13.50-13.99	14.000	13.20	211.00	45.00	142.50	4071 2.500	4110 13.500
13.50-13.99	15.875	13.20	211.00	45.00	142.50	4071 2.500	4110 13.505
14.00-14.49	14.000	13.70	217.00	45.00	147.70	4071 3.000	4110 14.000
14.00-14.49	15.875	13.70	217.00	45.00	147.70	4071 3.000	4110 14.005
14.50-14.99	16.000	14.20	225.00	48.00	152.80	4071 3.000	4110 14.500
14.50-14.99	15.875	14.20	225.00	48.00	152.80	4071 3.000	4110 14.505
15.00-15.49	16.000	14.70	232.00	48.00	157.80	4071 3.001	4110 15.000
15.00-15.49	15.875	14.70	232.00	48.00	157.80	4071 3.001	4110 15.005
15.50-15.99	16.000	15.20	237.00	48.00	162.90	4071 3.001	4110 15.500
15.50-15.99	15.875	15.20	237.00	48.00	162.90	4071 3.001	4110 15.505
16.00-16.49	16.000	15.70	243.00	48.00	168.00	4071 3.500	4110 16.000
16.00-16.49	15.875	15.70	243.00	48.00	168.00	4071 3.500	4110 16.005
16.50-16.99	18.000	16.20	249.00	48.00	170.00	4071 3.500	4110 16.500
16.50-16.99	19.050	16.20	249.00	48.00	170.00	4071 3.500	4110 16.505
17.00-17.49	18.000	16.70	255.00	48.00	178.30	4071 3.500	4110 17.000
17.00-17.49	19.050	16.70	255.00	48.00	178.30	4071 3.500	4110 17.005
17.50-17.99	18.000	17.20	260.00	48.00	183.50	4071 3.500	4110 17.500
17.50-17.99	19.050	17.20	260.00	48.00	183.50	4071 3.500	4110 17.505
18.00-18.49	18.000	17.70	267.00	48.00	188.40	4071 4.000	4110 18.000
18.00-18.49	19.050	17.70	267.00	48.00	188.40	4071 4.000	4110 18.005
18.50-18.99	20.000	18.20	274.00	50.00	193.50	4071 4.000	4110 18.500
18.50-18.99	19.050	18.20	274.00	50.00	193.50	4071 4.000	4110 18.505
19.00-19.49	20.000	18.70	280.00	50.00	198.70	4071 4.000	4110 19.000
19.00-19.49	19.050	18.70	280.00	50.00	198.70	4071 4.000	4110 19.005
19.50-19.99	20.000	19.20	286.00	50.00	203.70	4071 4.000	4110 19.500
19.50-19.99	19.050	19.20	286.00	50.00	203.70	4071 4.000	4110 19.505
20.00-20.49	20.000	19.70	292.00	50.00	208.90	4071 4.500	4110 20.000
20.00-20.49	19.050	19.70	292.00	50.00	208.90	4071 4.500	4110 20.005
20.50-20.99	25.000	20.20	306.00	56.00	214.00	4071 4.500	4110 20.500
20.50-20.99	25.400	20.20	306.00	56.00	214.00	4071 4.500	4110 20.505
21.00-21.49	25.000	20.70	312.00	56.00	219.10	4071 4.500	4110 21.000
21.00-21.49	25.400	20.70	312.00	56.00	219.10	4071 4.500	4110 21.005

d1	d2 h6	d3	L	l3	l5	F	Order no.
	mm	mm	mm	mm	mm		
21.50-21.99	25.000	21.20	317.00	56.00	224.20	4071 4.500	4110 21.500
21.50-21.99	25.400	21.20	317.00	56.00	224.20	4071 4.500	4110 21.505
22.00-22.49	25.000	21.70	323.00	56.00	229.30	4071 5.000	4110 22.000
22.00-22.49	25.400	21.70	323.00	56.00	229.30	4071 5.000	4110 22.005
22.50-22.99	25.000	22.20	329.00	56.00	234.40	4071 5.000	4110 22.500
22.50-22.99	25.400	22.20	329.00	56.00	234.40	4071 5.000	4110 22.505
23.00-23.49	25.000	22.70	335.00	56.00	239.50	4071 5.000	4110 23.000
23.00-23.49	25.400	22.70	335.00	56.00	239.50	4071 5.000	4110 23.005
23.50-23.99	25.000	23.20	341.00	56.00	244.60	4071 5.000	4110 23.500
23.50-23.99	25.400	23.20	341.00	56.00	244.60	4071 5.000	4110 23.505
24.00-24.49	25.000	23.70	347.00	56.00	249.70	4071 5.001	4110 24.000
24.00-24.49	25.400	23.70	347.00	56.00	249.70	4071 5.001	4110 24.005
24.50-24.99	25.000	24.20	352.00	56.00	254.80	4071 5.001	4110 24.500
24.50-24.99	25.400	24.20	352.00	56.00	254.80	4071 5.001	4110 24.505
25.00-25.49	25.000	24.70	359.00	56.00	259.90	4071 5.001	4110 25.000
25.00-25.49	25.400	24.70	359.00	56.00	259.90	4071 5.001	4110 25.005
25.50-25.99	32.000	25.20	369.00	60.00	265.00	4071 5.001	4110 25.500
25.50-25.99	31.750	25.20	369.00	60.00	265.00	4071 5.001	4110 25.505
26.00-26.49	32.000	25.70	377.00	60.00	270.00	4071 5.003	4110 26.000
26.00-26.49	31.750	25.70	377.00	60.00	270.00	4071 5.003	4110 26.005
26.50-26.99	32.000	26.20	382.00	60.00	275.00	4071 5.003	4110 26.500
26.50-26.99	31.750	26.20	382.00	60.00	275.00	4071 5.003	4110 26.505
27.00-27.49	32.000	26.70	388.00	60.00	280.10	4071 5.003	4110 27.000
27.00-27.49	31.750	26.70	388.00	60.00	280.10	4071 5.003	4110 27.005
27.50-27.99	32.000	27.20	394.00	60.00	285.20	4071 5.003	4110 27.500
27.50-27.99	31.750	27.20	394.00	60.00	285.20	4071 5.003	4110 27.505
28.00-28.49	32.000	27.70	400.00	60.00	290.30	4071 5.003	4110 28.000
28.00-28.49	31.750	27.70	400.00	60.00	290.30	4071 5.003	4110 28.005
28.50-28.99	32.000	28.20	405.00	60.00	295.40	4071 5.003	4110 28.500
28.50-28.99	31.750	28.20	405.00	60.00	295.40	4071 5.003	4110 28.505
29.00-29.49	32.000	28.70	412.00	60.00	300.50	4071 5.003	4110 29.000
29.00-29.49	31.750	28.70	412.00	60.00	300.50	4071 5.003	4110 29.005
29.50-29.99	32.000	29.20	418.00	60.00	305.60	4071 5.003	4110 29.500
29.50-29.99	31.750	29.20	418.00	60.00	305.60	4071 5.003	4110 29.505
30.00-30.49	32.000	29.70	424.00	60.00	310.60	4071 6.000	4110 30.000
30.00-30.49	31.750	29.70	424.00	60.00	310.60	4071 6.000	4110 30.005
30.50-30.99	32.000	30.20	429.00	60.00	315.70	4071 6.000	4110 30.500
30.50-30.99	31.750	30.20	429.00	60.00	315.70	4071 6.000	4110 30.505
31.00-31.49	32.000	30.70	435.00	60.00	320.80	4071 6.000	4110 31.000
31.00-31.49	31.750	30.70	435.00	60.00	320.80	4071 6.000	4110 31.005
31.50-31.99	32.000	31.20	441.00	60.00	325.90	4071 6.000	4110 31.500
31.50-31.99	31.750	31.20	441.00	60.00	325.90	4071 6.000	4110 31.505

Interchangeable inserts HT 800

HT 800 WP Pilot | WN | R | 145° | m7

Tool material	Solid carbide
Surface	a

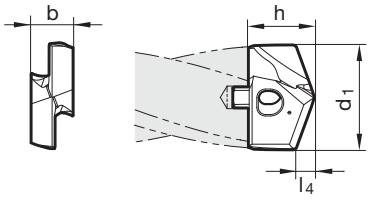
P	○
M	○
K	○
N	○
S	○
H	○

web thinning ≥ Ø 11.000 • facet point grind • main cutting edge form straight (after correction) • clamping screws art. no. 4071 included • piloting in all materials

Drilling tools

GÜHRINGNAVIGATOR

Cutting data page 308-313





Article no. **4111**

d1 mm	d1 inch	l4 mm	b mm	h mm	Order no.
11.000		1.80	4.50	7.20	4111 11.000
11.200		1.80	4.50	7.20	4111 11.200
11.500		1.90	4.50	7.20	4111 11.500
11.510	29/64	1.90	4.50	7.20	4111 11.510
11.700		1.90	4.50	7.20	4111 11.700
11.800		1.90	4.50	7.20	4111 11.800
11.910	15/32	1.90	4.50	7.20	4111 11.910
12.000		1.90	5.00	7.40	4111 12.000
12.100		2.00	5.00	7.40	4111 12.100
12.200		2.00	5.00	7.40	4111 12.200
12.300	31/64	2.00	5.00	7.40	4111 12.300
12.500		2.00	5.00	7.40	4111 12.500
12.600		2.00	5.00	7.40	4111 12.600
12.700	1/2	2.10	5.00	7.40	4111 12.700
12.800		2.10	5.00	7.40	4111 12.800
12.900		2.10	5.00	7.40	4111 12.900
13.000		2.10	5.50	8.20	4111 13.000
13.100	33/64	2.10	5.50	8.20	4111 13.100
13.490	17/32	2.20	5.50	8.20	4111 13.490
13.500		2.20	5.50	8.20	4111 13.500
13.600		2.20	5.50	8.20	4111 13.600
13.700		2.20	5.50	8.20	4111 13.700
13.800		2.20	5.50	8.20	4111 13.800
13.890	35/64	2.20	5.50	8.20	4111 13.890
14.000		2.30	6.00	9.40	4111 14.000
14.100		2.30	6.00	9.40	4111 14.100
14.290	9/16	2.30	6.00	9.40	4111 14.290
14.400		2.30	6.00	9.40	4111 14.400
14.500		2.30	6.00	9.40	4111 14.500
14.600		2.40	6.00	9.40	4111 14.600
14.680	37/64	2.40	6.00	9.40	4111 14.680
14.700		2.40	6.00	9.40	4111 14.700
14.800		2.40	6.00	9.40	4111 14.800
15.000		2.40	6.00	9.40	4111 15.000
15.080	19/32	2.40	6.00	9.40	4111 15.080
15.100		2.40	6.00	9.40	4111 15.100
15.200		2.40	6.00	9.40	4111 15.200
15.300		2.50	6.00	9.40	4111 15.300
15.480	39/64	2.50	6.00	9.40	4111 15.480
15.500		2.50	6.00	9.40	4111 15.500
15.600		2.50	6.00	9.40	4111 15.600
15.700		2.50	6.00	9.40	4111 15.700

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
15.800		2.50	6.00	9.40	4111 15.800
15.870	5/8	2.60	6.00	9.40	4111 15.870
16.000		2.60	7.00	10.60	4111 16.000
16.270	41/64	2.60	7.00	10.60	4111 16.270
16.500		2.70	7.00	10.60	4111 16.500
16.670	21/32	2.70	7.00	10.60	4111 16.670
17.000		2.70	7.00	10.60	4111 17.000
17.070	43/64	2.70	7.00	10.60	4111 17.070
17.460	11/16	2.80	7.00	10.60	4111 17.460
17.500		2.80	7.00	10.60	4111 17.500
17.600		2.80	7.00	10.60	4111 17.600
17.860	45/64	2.90	7.00	10.60	4111 17.860
18.000		2.90	8.00	12.10	4111 18.000
18.260	23/32	2.90	8.00	12.10	4111 18.260
18.500		3.00	8.00	12.10	4111 18.500
18.650	47/64	3.00	8.00	12.10	4111 18.650
19.000		3.00	8.00	12.10	4111 19.000
19.050	3/4	3.10	8.00	12.10	4111 19.050
19.450	49/64	3.10	8.00	12.10	4111 19.450
19.500		3.10	8.00	12.10	4111 19.500
19.600		3.10	8.00	12.10	4111 19.600
19.840	25/32	3.20	8.00	12.10	4111 19.840
20.000		3.20	9.00	13.30	4111 20.000
20.240	51/64	3.20	9.00	13.30	4111 20.240
20.500		3.30	9.00	13.30	4111 20.500
20.640	13/16	3.30	9.00	13.30	4111 20.640
21.000		3.40	9.00	13.30	4111 21.000
21.030	53/64	3.40	9.00	13.30	4111 21.030
21.100		3.40	9.00	13.30	4111 21.100
21.430	27/32	3.40	9.00	13.30	4111 21.430
21.500		3.40	9.00	13.30	4111 21.500
21.830	55/64	3.50	9.00	13.30	4111 21.830
22.000		3.50	10.00	14.80	4111 22.000
22.220	7/8	3.60	10.00	14.80	4111 22.220
22.500		3.60	10.00	14.80	4111 22.500
22.620	57/64	3.60	10.00	14.80	4111 22.620
23.000		3.70	10.00	14.80	4111 23.000
23.020	29/32	3.70	10.00	14.80	4111 23.020
23.420	59/64	3.70	10.00	14.80	4111 23.420
23.500		3.80	10.00	14.80	4111 23.500
23.810	15/16	3.80	10.00	14.80	4111 23.810
24.000		3.80	11.00	15.30	4111 24.000
24.100		3.80	11.00	15.30	4111 24.100
24.210	61/64	3.90	11.00	15.30	4111 24.210
24.500		3.90	11.00	15.30	4111 24.500
24.610	31/32	3.90	11.00	15.30	4111 24.610
25.000	63/64	4.00	11.00	15.30	4111 25.000
25.400	1	4.10	11.00	15.30	4111 25.400
25.500		4.10	11.00	15.30	4111 25.500
25.700		4.10	11.00	15.30	4111 25.700
26.000		4.10	12.00	19.40	4111 26.000
26.190	1 1/32	4.20	12.00	19.40	4111 26.190
26.500		4.20	12.00	19.40	4111 26.500
26.590	1 3/64	4.20	12.00	19.40	4111 26.590
27.000		4.30	12.00	19.40	4111 27.000
27.500		4.40	12.00	19.40	4111 27.500
27.700		4.40	12.00	19.40	4111 27.700
27.780	1 3/32	4.40	12.00	19.40	4111 27.780
28.000		4.50	13.00	20.10	4111 28.000
28.180	1 7/64	4.50	13.00	20.10	4111 28.180
28.500		4.50	13.00	20.10	4111 28.500
28.580	1 1/8	4.60	13.00	20.10	4111 28.580
29.000		4.60	13.00	20.10	4111 29.000
29.370	1 5/32	4.70	13.00	20.10	4111 29.370
29.500		4.70	13.00	20.10	4111 29.500
29.770	1 11/64	4.70	13.00	20.10	4111 29.770
30.000		4.80	14.00	21.70	4111 30.000
30.160	1 3/16	4.80	14.00	21.70	4111 30.160
30.500		4.90	14.00	21.70	4111 30.500
30.960	1 7/32	4.90	14.00	21.70	4111 30.960
31.000		4.90	14.00	21.70	4111 31.000
31.500		5.00	14.00	21.70	4111 31.500

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
31.750	1 1/4	5.10	14.00	21.70	4111 31.750
32.000		5.10	15.00	22.40	4111 32.000
32.500		5.20	15.00	22.40	4111 32.500
32.540	1 9/32	5.20	15.00	22.40	4111 32.540
32.940	1 19/64	5.20	15.00	22.40	4111 32.940
33.000		5.30	15.00	22.40	4111 33.000
33.340	1 5/16	5.30	15.00	22.40	4111 33.340
33.500		5.30	15.00	22.40	4111 33.500
34.000		5.40	15.00	22.40	4111 34.000
34.130	1 11/32	5.40	15.00	22.40	4111 34.130
34.500		5.50	15.00	22.40	4111 34.500
34.930	1 3/8	5.60	15.00	22.40	4111 34.930
35.000		5.60	15.00	22.40	4111 35.000
35.500		5.60	15.00	22.40	4111 35.500
35.720	1 13/32	5.70	15.00	22.40	4111 35.720
36.000		5.70	16.00	23.20	4111 36.000
36.500		5.80	16.00	23.20	4111 36.500
36.510	1 7/16	5.80	16.00	23.20	4111 36.510
37.000		5.90	16.00	23.20	4111 37.000
37.310	1 15/32	5.90	16.00	23.20	4111 37.310
37.500		6.00	16.00	23.20	4111 37.500
38.000		6.00	16.00	23.20	4111 38.000
38.100	1 1/2	6.10	16.00	23.20	4111 38.100
38.500	1 33/64	6.10	16.00	23.20	4111 38.500
39.000		6.20	16.00	23.20	4111 39.000
39.500		6.30	16.00	23.20	4111 39.500
40.000		6.40	16.00	23.20	4111 40.000

Interchangeable inserts HT 800

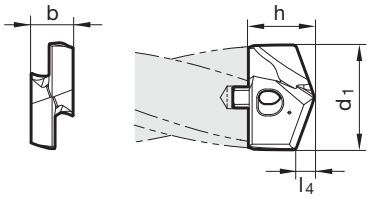
HT 800 WP | WN | R | 140° | h7

Tool material	**Solid carbide**
Surface	F

P	•	web thinning ≥ Ø 11.000 • facet point grind • main cutting edge form straight (after correction) • clamping screws art. no. 4071 included
M	○	
K	○	
N		free-cutting steels, heat-treatable steels • structural and case hardened steels • alloyed steels up to 1200 N/mm²
S		
H		

GÜHRINGNAVIGATOR

Cutting data page 308-313





Article no. **4112**

d1 mm	d1 inch	l4 mm	b mm	h mm	Order no.
11.000		2.10	4.50	7.50	4112 11.000
11.200		2.10	4.50	7.50	4112 11.200
11.500		2.10	4.50	7.50	4112 11.500
11.510	29/64	2.10	4.50	7.50	4112 11.510
11.700		2.20	4.50	7.50	4112 11.700
11.800		2.20	4.50	7.50	4112 11.800
11.910	15/32	2.20	4.50	7.50	4112 11.910
12.000		2.20	5.00	7.70	4112 12.000
12.100		2.30	5.00	7.70	4112 12.100
12.200		2.30	5.00	7.70	4112 12.200
12.300	31/64	2.30	5.00	7.70	4112 12.300
12.500		2.30	5.00	7.70	4112 12.500
12.600		2.30	5.00	7.70	4112 12.600
12.700	1/2	2.40	5.00	7.70	4112 12.700
12.800		2.40	5.00	7.70	4112 12.800
12.900		2.40	5.00	7.70	4112 12.900
13.000		2.40	5.50	8.50	4112 13.000
13.100	33/64	2.40	5.50	8.50	4112 13.100
13.300		2.50	5.50	8.50	4112 13.300
13.490	17/32	2.50	5.50	8.50	4112 13.490
13.500		2.50	5.50	8.50	4112 13.500
13.600		2.50	5.50	8.50	4112 13.600
13.700		2.50	5.50	8.50	4112 13.700
13.800		2.60	5.50	8.50	4112 13.800
13.890	35/64	2.60	5.50	8.50	4112 13.890
14.000		2.60	6.00	9.60	4112 14.000
14.100		2.60	6.00	9.60	4112 14.100
14.290	9/16	2.70	6.00	9.60	4112 14.290
14.400		2.70	6.00	9.60	4112 14.400
14.500		2.70	6.00	9.60	4112 14.500
14.600		2.70	6.00	9.60	4112 14.600
14.680	37/64	2.70	6.00	9.60	4112 14.680
14.700		2.70	6.00	9.60	4112 14.700
14.800		2.70	6.00	9.60	4112 14.800
15.000		2.80	6.00	9.80	4112 15.000
15.080	19/32	2.80	6.00	9.80	4112 15.080
15.100		2.80	6.00	9.80	4112 15.100
15.200		2.80	6.00	9.80	4112 15.200
15.300		2.80	6.00	9.80	4112 15.300
15.480	39/64	2.90	6.00	9.80	4112 15.480
15.500		2.90	6.00	9.80	4112 15.500
15.600		2.90	6.00	9.80	4112 15.600

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
15.700		2.90	6.00	9.80	4112 15.700
15.800		2.90	6.00	9.80	4112 15.800
15.870	5/8	2.90	6.00	9.80	4112 15.870
16.000		3.00	7.00	11.00	4112 16.000
16.270	41/64	3.00	7.00	11.00	4112 16.270
16.500		3.10	7.00	11.00	4112 16.500
16.670	21/32	3.10	7.00	11.00	4112 16.670
17.000		3.10	7.00	11.00	4112 17.000
17.070	43/64	3.20	7.00	11.00	4112 17.070
17.250		3.20	7.00	11.00	4112 17.250
17.300		3.20	7.00	11.00	4112 17.300
17.460	11/16	3.20	7.00	11.00	4112 17.460
17.500		3.20	7.00	11.00	4112 17.500
17.600		3.30	7.00	11.00	4112 17.600
17.860	45/64	3.30	7.00	11.00	4112 17.860
18.000		3.30	8.00	12.60	4112 18.000
18.260	23/32	3.40	8.00	12.60	4112 18.260
18.500		3.40	8.00	12.60	4112 18.500
18.650	47/64	3.40	8.00	12.60	4112 18.650
18.900		3.50	8.00	12.60	4112 18.900
19.000		3.50	8.00	12.60	4112 19.000
19.050	3/4	3.50	8.00	12.60	4112 19.050
19.250		3.60	8.00	12.60	4112 19.250
19.300		3.60	8.00	12.60	4112 19.300
19.450	49/64	3.60	8.00	12.60	4112 19.450
19.500		3.60	8.00	12.60	4112 19.500
19.600		3.60	8.00	12.60	4112 19.600
19.840	25/32	3.70	8.00	12.60	4112 19.840
20.000		3.70	9.00	13.90	4112 20.000
20.240	51/64	3.70	9.00	13.90	4112 20.240
20.500		3.80	9.00	13.90	4112 20.500
20.640	13/16	3.80	9.00	13.90	4112 20.640
20.900		3.90	9.00	13.90	4112 20.900
21.000		3.90	9.00	13.90	4112 21.000
21.030	53/64	3.90	9.00	13.90	4112 21.030
21.100		3.90	9.00	13.90	4112 21.100
21.430	27/32	3.90	9.00	13.90	4112 21.430
21.500		4.00	9.00	13.90	4112 21.500
21.700		4.00	9.00	13.90	4112 21.700
21.830	55/64	4.00	9.00	13.90	4112 21.830
22.000		4.10	10.00	15.30	4112 22.000
22.220	7/8	4.10	10.00	15.30	4112 22.220
22.500		4.10	10.00	15.30	4112 22.500
22.620	57/64	4.20	10.00	15.30	4112 22.620
22.700		4.20	10.00	15.30	4112 22.700
23.000		4.20	10.00	15.30	4112 23.000
23.020	29/32	4.20	10.00	15.30	4112 23.020
23.420	59/64	4.30	10.00	15.30	4112 23.420
23.500		4.30	10.00	15.30	4112 23.500
23.700		4.40	10.00	15.30	4112 23.700
23.810	15/16	4.40	10.00	15.30	4112 23.810
24.000		4.40	11.00	15.80	4112 24.000
24.100		4.40	11.00	15.80	4112 24.100
24.210	61/64	4.50	11.00	15.80	4112 24.210
24.500		4.50	11.00	15.80	4112 24.500
24.610	31/32	4.50	11.00	15.80	4112 24.610
25.000	63/64	4.60	11.00	15.80	4112 25.000
25.250		4.60	11.00	15.80	4112 25.250
25.400	1	4.70	11.00	15.80	4112 25.400
25.500		4.70	11.00	15.80	4112 25.500
25.650		4.70	11.00	15.80	4112 25.650
25.670		4.70	11.00	15.80	4112 25.670
25.700		4.70	11.00	15.80	4112 25.700
25.810		4.70	11.00	15.80	4112 25.810
26.000		4.80	12.00	20.00	4112 26.000
26.190	1 1/32	4.80	12.00	20.00	4112 26.190
26.500		4.90	12.00	20.00	4112 26.500
26.590	1 3/64	4.90	12.00	20.00	4112 26.590
27.000		5.00	12.00	20.00	4112 27.000
27.500		5.10	12.00	20.00	4112 27.500
27.700		5.10	12.00	20.00	4112 27.700
27.780	1 3/32	5.10	12.00	20.00	4112 27.780

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
28.000		5.10	13.00	20.70	4112 28.000
28.180	1 7/64	5.20	13.00	20.70	4112 28.180
28.500		5.20	13.00	20.70	4112 28.500
28.580		5.30	13.00	20.70	4112 28.580
29.000		5.30	13.00	20.70	4112 29.000
29.370	1 5/32	5.40	13.00	20.70	4112 29.370
29.500		5.40	13.00	20.70	4112 29.500
29.600		5.40	13.00	20.70	4112 29.600
29.770	1 11/64	5.50	13.00	20.70	4112 29.770
30.000		5.50	14.00	22.30	4112 30.000
30.160	1 3/16	5.50	14.00	22.30	4112 30.160
30.500		5.60	14.00	22.30	4112 30.500
30.960	1 7/32	5.70	14.00	22.30	4112 30.960
31.000		5.70	14.00	22.30	4112 31.000
31.500		5.80	14.00	22.30	4112 31.500
31.750	1 1/4	5.80	14.00	22.30	4112 31.750
32.000		5.90	15.00	23.10	4112 32.000
32.500		6.00	15.00	23.10	4112 32.500
32.540	1 9/32	6.00	15.00	23.10	4112 32.540
32.940	1 19/64	6.00	15.00	23.10	4112 32.940
33.000		6.10	15.00	23.10	4112 33.000
33.340	1 5/16	6.10	15.00	23.10	4112 33.340
33.500		6.10	15.00	23.10	4112 33.500
34.000		6.20	15.00	23.10	4112 34.000
34.130	1 11/32	6.30	15.00	23.10	4112 34.130
34.500		6.30	15.00	23.10	4112 34.500
34.930		6.40	15.00	23.10	4112 34.930
35.000		6.40	15.00	23.10	4112 35.000
35.500		6.50	15.00	23.10	4112 35.500
35.720	1 13/32	6.60	15.00	23.10	4112 35.720
36.000		6.60	16.00	23.90	4112 36.000
36.500		6.70	16.00	23.90	4112 36.500
36.510	1 7/16	6.70	16.00	23.90	4112 36.510
37.000		6.80	16.00	23.90	4112 37.000
37.310	1 15/32	6.80	16.00	23.90	4112 37.310
37.500		6.90	16.00	23.90	4112 37.500
38.000		7.00	16.00	23.90	4112 38.000
38.100	1 1/2	7.00	16.00	23.90	4112 38.100
38.500	1 33/64	7.10	16.00	23.90	4112 38.500
39.000		7.10	16.00	23.90	4112 39.000
39.500		7.20	16.00	23.90	4112 39.500
40.000		7.30	16.00	23.90	4112 40.000

Interchangeable inserts HT 800

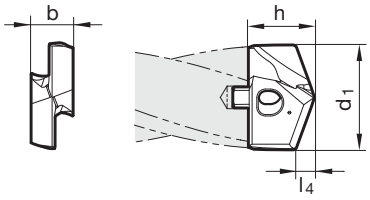
HT 800 WP | WN | R | 140° | h7

Tool material	Solid carbide
Surface	◯

P	web thinning ≥ Ø 11.000 • relieved cone • main cutting edge form concave • clamping screws art. no. 4071 included
M	
K	
N •	aluminium and Al alloys • non-ferrous metals
S	
H	

GÜHRINGNAVIGATOR

Cutting data page 308-313





Article no. **4114**

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
11.000		2.10	4.50	7.50	4114 11.000
11.200		2.10	4.50	7.50	4114 11.200
11.500		2.10	4.50	7.50	4114 11.500
11.510	29/64	2.10	4.50	7.50	4114 11.510
11.700		2.20	4.50	7.50	4114 11.700
11.800		2.20	4.50	7.50	4114 11.800
11.910	15/32	2.20	4.50	7.50	4114 11.910
12.000		2.20	5.00	7.70	4114 12.000
12.100		2.30	5.00	7.70	4114 12.100
12.200		2.30	5.00	7.70	4114 12.200
12.300	31/64	2.30	5.00	7.70	4114 12.300
12.500		2.30	5.00	7.70	4114 12.500
12.600		2.30	5.00	7.70	4114 12.600
12.700	1/2	2.40	5.00	7.70	4114 12.700
12.800		2.40	5.00	7.70	4114 12.800
12.900		2.40	5.00	7.70	4114 12.900
13.000		2.40	5.50	8.50	4114 13.000
13.100	33/64	2.40	5.50	8.50	4114 13.100
13.490	17/32	2.50	5.50	8.50	4114 13.490
13.500		2.50	5.50	8.50	4114 13.500
13.600		2.50	5.50	8.50	4114 13.600
13.700		2.50	5.50	8.50	4114 13.700
13.800		2.60	5.50	8.50	4114 13.800
13.890	35/64	2.60	5.50	8.50	4114 13.890
14.000		2.60	6.00	9.60	4114 14.000
14.100		2.60	6.00	9.60	4114 14.100
14.290	9/16	2.70	6.00	9.60	4114 14.290
14.400		2.70	6.00	9.60	4114 14.400
14.500		2.70	6.00	9.60	4114 14.500
14.600		2.70	6.00	9.60	4114 14.600
14.680	37/64	2.70	6.00	9.60	4114 14.680
14.700		2.70	6.00	9.60	4114 14.700
14.800		2.70	6.00	9.60	4114 14.800
15.000		2.80	6.00	9.80	4114 15.000
15.080	19/32	2.80	6.00	9.80	4114 15.080
15.100		2.80	6.00	9.80	4114 15.100
15.200		2.80	6.00	9.80	4114 15.200
15.300		2.80	6.00	9.80	4114 15.300
15.480	39/64	2.90	6.00	9.80	4114 15.480
15.500		2.90	6.00	9.80	4114 15.500
15.600		2.90	6.00	9.80	4114 15.600
15.700		2.90	6.00	9.80	4114 15.700

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
15.800		2.90	6.00	9.80	4114 15.800
15.870	5/8	2.90	6.00	9.80	4114 15.870
16.000		3.00	7.00	11.00	4114 16.000
16.270	41/64	3.00	7.00	11.00	4114 16.270
16.500		3.10	7.00	11.00	4114 16.500
16.670	21/32	3.10	7.00	11.00	4114 16.670
17.000		3.10	7.00	11.00	4114 17.000
17.070	43/64	3.20	7.00	11.00	4114 17.070
17.460	11/16	3.20	7.00	11.00	4114 17.460
17.500		3.20	7.00	11.00	4114 17.500
17.600		3.30	7.00	11.00	4114 17.600
17.860	45/64	3.30	7.00	11.00	4114 17.860
18.000		3.30	8.00	12.60	4114 18.000
18.260	23/32	3.40	8.00	12.60	4114 18.260
18.500		3.40	8.00	12.60	4114 18.500
18.650	47/64	3.40	8.00	12.60	4114 18.650
19.000		3.50	8.00	12.60	4114 19.000
19.050	3/4	3.50	8.00	12.60	4114 19.050
19.250		3.60	8.00	12.60	4114 19.250
19.450	49/64	3.60	8.00	12.60	4114 19.450
19.500		3.60	8.00	12.60	4114 19.500
19.600		3.60	8.00	12.60	4114 19.600
19.840	25/32	3.70	8.00	12.60	4114 19.840
20.000		3.70	9.00	13.90	4114 20.000
20.240	51/64	3.70	9.00	13.90	4114 20.240
20.500		3.80	9.00	13.90	4114 20.500
20.640	13/16	3.80	9.00	13.90	4114 20.640
21.000		3.90	9.00	13.90	4114 21.000
21.030	53/64	3.90	9.00	13.90	4114 21.030
21.100		3.90	9.00	13.90	4114 21.100
21.430	27/32	3.90	9.00	13.90	4114 21.430
21.500		4.00	9.00	13.90	4114 21.500
21.830	55/64	4.00	9.00	13.90	4114 21.830
22.000		4.10	10.00	15.30	4114 22.000
22.220	7/8	4.10	10.00	15.30	4114 22.220
22.500		4.10	10.00	15.30	4114 22.500
22.620	57/64	4.20	10.00	15.30	4114 22.620
23.000		4.20	10.00	15.30	4114 23.000
23.020	29/32	4.20	10.00	15.30	4114 23.020
23.420	59/64	4.30	10.00	15.30	4114 23.420
23.500		4.30	10.00	15.30	4114 23.500
23.810	15/16	4.40	10.00	15.30	4114 23.810
24.000		4.40	11.00	15.80	4114 24.000
24.100		4.40	11.00	15.80	4114 24.100
24.210	61/64	4.50	11.00	15.80	4114 24.210
24.500		4.50	11.00	15.80	4114 24.500
24.610	31/32	4.50	11.00	15.80	4114 24.610
25.000	63/64	4.60	11.00	15.80	4114 25.000
25.400	1	4.70	11.00	15.80	4114 25.400
25.500		4.70	11.00	15.80	4114 25.500
25.670		4.70	11.00	15.80	4114 25.670
25.700		4.70	11.00	15.80	4114 25.700
25.810		4.70	11.00	15.80	4114 25.810
26.000		4.80	12.00	20.00	4114 26.000
26.190	1 1/32	4.80	12.00	20.00	4114 26.190
26.500		4.90	12.00	20.00	4114 26.500
26.590	1 3/64	4.90	12.00	20.00	4114 26.590
27.000		5.00	12.00	20.00	4114 27.000
27.500		5.10	12.00	20.00	4114 27.500
27.700		5.10	12.00	20.00	4114 27.700
27.780	1 3/32	5.10	12.00	20.00	4114 27.780
28.000		5.10	13.00	20.70	4114 28.000
28.180	1 7/64	5.20	13.00	20.70	4114 28.180
28.500		5.20	13.00	20.70	4114 28.500
28.580		5.30	13.00	20.70	4114 28.580
29.000		5.30	13.00	20.70	4114 29.000
29.370	1 5/32	5.40	13.00	20.70	4114 29.370
29.500		5.40	13.00	20.70	4114 29.500
29.770	1 11/64	5.50	13.00	20.70	4114 29.770
30.000		5.50	14.00	22.30	4114 30.000
30.160	1 3/16	5.50	14.00	22.30	4114 30.160
30.500		5.60	14.00	22.30	4114 30.500

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
30.960	1 7/32	5.70	14.00	22.30	4114 30.960
31.000		5.70	14.00	22.30	4114 31.000
31.500		5.80	14.00	22.30	4114 31.500
31.750	1 1/4	5.80	14.00	22.30	4114 31.750
32.000		5.90	15.00	23.10	4114 32.000
32.500		6.00	15.00	23.10	4114 32.500
32.540	1 9/32	6.00	15.00	23.10	4114 32.540
32.940	1 19/64	6.00	15.00	23.10	4114 32.940
33.000		6.10	15.00	23.10	4114 33.000
33.340	1 5/16	6.10	15.00	23.10	4114 33.340
33.500		6.10	15.00	23.10	4114 33.500
34.000		6.20	15.00	23.10	4114 34.000
34.130	1 11/32	6.30	15.00	23.10	4114 34.130
34.500		6.30	15.00	23.10	4114 34.500
34.930		6.40	15.00	23.10	4114 34.930
35.000		6.40	15.00	23.10	4114 35.000
35.500		6.50	15.00	23.10	4114 35.500
35.720	1 13/32	6.60	15.00	23.10	4114 35.720
36.000		6.60	16.00	23.90	4114 36.000
36.500		6.70	16.00	23.90	4114 36.500
36.510	1 7/16	6.70	16.00	23.90	4114 36.510
37.000		6.80	16.00	23.90	4114 37.000
37.310	1 15/32	6.80	16.00	23.90	4114 37.310
37.500		6.90	16.00	23.90	4114 37.500
38.000		7.00	16.00	23.90	4114 38.000
38.100	1 1/2	7.00	16.00	23.90	4114 38.100
38.500	1 33/64	7.10	16.00	23.90	4114 38.500
39.000		7.10	16.00	23.90	4114 39.000
39.500		7.20	16.00	23.90	4114 39.500
40.000		7.30	16.00	23.90	4114 40.000

Interchangeable inserts HT 800

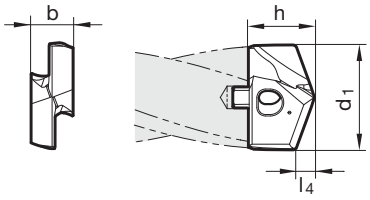
HT 800 WP | WN | R | 140° | h7

Tool material	**Solid carbide**
Surface	a

P	○	web thinning ≥ Ø 11.000 • relieved cone • main cutting edge form straight (after correction) • clamping screws art. no. 4071 included
M	•	
K		
N		
S	○	stainless steels
H	○	

GÜHRINGNAVIGATOR

Cutting data page 308-313





Article no. **4115**

d1 mm	d1 inch	l4 mm	b mm	h mm	Order no.
11.000		2.10	4.50	7.50	4115 11.000
11.200		2.10	4.50	7.50	4115 11.200
11.500		2.10	4.50	7.50	4115 11.500
11.510	29/64	2.10	4.50	7.50	4115 11.510
11.700		2.20	4.50	7.50	4115 11.700
11.800		2.20	4.50	7.50	4115 11.800
11.910	15/32	2.20	4.50	7.50	4115 11.910
12.000		2.20	5.00	7.70	4115 12.000
12.100		2.30	5.00	7.70	4115 12.100
12.200		2.30	5.00	7.70	4115 12.200
12.300	31/64	2.30	5.00	7.70	4115 12.300
12.500		2.30	5.00	7.70	4115 12.500
12.600		2.30	5.00	7.70	4115 12.600
12.700	1/2	2.40	5.00	7.70	4115 12.700
12.800		2.40	5.00	7.70	4115 12.800
12.900		2.40	5.00	7.70	4115 12.900
13.000		2.40	5.50	8.50	4115 13.000
13.100	33/64	2.40	5.50	8.50	4115 13.100
13.490	17/32	2.50	5.50	8.50	4115 13.490
13.500		2.50	5.50	8.50	4115 13.500
13.600		2.50	5.50	8.50	4115 13.600
13.700		2.50	5.50	8.50	4115 13.700
13.800		2.60	5.50	8.50	4115 13.800
13.890	35/64	2.60	5.50	8.50	4115 13.890
14.000		2.60	6.00	9.60	4115 14.000
14.100		2.60	6.00	9.60	4115 14.100
14.290	9/16	2.70	6.00	9.60	4115 14.290
14.400		2.70	6.00	9.60	4115 14.400
14.500		2.70	6.00	9.60	4115 14.500
14.600		2.70	6.00	9.60	4115 14.600
14.680	37/64	2.70	6.00	9.60	4115 14.680
14.700		2.70	6.00	9.60	4115 14.700
14.800		2.70	6.00	9.60	4115 14.800
15.000		2.80	6.00	9.80	4115 15.000
15.080	19/32	2.80	6.00	9.80	4115 15.080
15.100		2.80	6.00	9.80	4115 15.100
15.200		2.80	6.00	9.80	4115 15.200
15.300		2.80	6.00	9.80	4115 15.300
15.480	39/64	2.90	6.00	9.80	4115 15.480
15.500		2.90	6.00	9.80	4115 15.500
15.600		2.90	6.00	9.80	4115 15.600
15.700		2.90	6.00	9.80	4115 15.700

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
15.800		2.90	6.00	9.80	4115 15.800
15.870	5/8	2.90	6.00	9.80	4115 15.870
16.000		3.00	7.00	11.00	4115 16.000
16.270	41/64	3.00	7.00	11.00	4115 16.270
16.500		3.10	7.00	11.00	4115 16.500
16.670	21/32	3.10	7.00	11.00	4115 16.670
17.000		3.10	7.00	11.00	4115 17.000
17.070	43/64	3.20	7.00	11.00	4115 17.070
17.250		3.20	7.00	11.00	4115 17.250
17.460	11/16	3.20	7.00	11.00	4115 17.460
17.500		3.20	7.00	11.00	4115 17.500
17.600		3.30	7.00	11.00	4115 17.600
17.860	45/64	3.30	7.00	11.00	4115 17.860
18.000		3.30	8.00	12.60	4115 18.000
18.260	23/32	3.40	8.00	12.60	4115 18.260
18.500		3.40	8.00	12.60	4115 18.500
18.650	47/64	3.40	8.00	12.60	4115 18.650
19.000		3.50	8.00	12.60	4115 19.000
19.050	3/4	3.50	8.00	12.60	4115 19.050
19.250		3.60	8.00	12.60	4115 19.250
19.450	49/64	3.60	8.00	12.60	4115 19.450
19.500		3.60	8.00	12.60	4115 19.500
19.600		3.60	8.00	12.60	4115 19.600
19.840	25/32	3.70	8.00	12.60	4115 19.840
20.000		3.70	9.00	13.90	4115 20.000
20.240	51/64	3.70	9.00	13.90	4115 20.240
20.500		3.80	9.00	13.90	4115 20.500
20.640	13/16	3.80	9.00	13.90	4115 20.640
21.000		3.90	9.00	13.90	4115 21.000
21.030	53/64	3.90	9.00	13.90	4115 21.030
21.100		3.90	9.00	13.90	4115 21.100
21.430	27/32	3.90	9.00	13.90	4115 21.430
21.500		4.00	9.00	13.90	4115 21.500
21.830	55/64	4.00	9.00	13.90	4115 21.830
22.000		4.10	10.00	15.30	4115 22.000
22.220	7/8	4.10	10.00	15.30	4115 22.220
22.500		4.10	10.00	15.30	4115 22.500
22.620	57/64	4.20	10.00	15.30	4115 22.620
23.000		4.20	10.00	15.30	4115 23.000
23.020	29/32	4.20	10.00	15.30	4115 23.020
23.420	59/64	4.30	10.00	15.30	4115 23.420
23.500		4.30	10.00	15.30	4115 23.500
23.810	15/16	4.40	10.00	15.30	4115 23.810
24.000		4.40	11.00	15.80	4115 24.000
24.100		4.40	11.00	15.80	4115 24.100
24.210	61/64	4.50	11.00	15.80	4115 24.210
24.500		4.50	11.00	15.80	4115 24.500
24.610	31/32	4.50	11.00	15.80	4115 24.610
25.000	63/64	4.60	11.00	15.80	4115 25.000
25.250		4.60	11.00	15.80	4115 25.250
25.400	1	4.70	11.00	15.80	4115 25.400
25.500		4.70	11.00	15.80	4115 25.500
25.650		4.70	11.00	15.80	4115 25.650
25.700		4.70	11.00	15.80	4115 25.700
26.000		4.80	12.00	20.00	4115 26.000
26.190	1 1/32	4.80	12.00	20.00	4115 26.190
26.500		4.90	12.00	20.00	4115 26.500
26.590	1 3/64	4.90	12.00	20.00	4115 26.590
27.000		5.00	12.00	20.00	4115 27.000
27.500		5.10	12.00	20.00	4115 27.500
27.700		5.10	12.00	20.00	4115 27.700
27.780	1 3/32	5.10	12.00	20.00	4115 27.780
28.000		5.10	13.00	20.70	4115 28.000
28.180	1 7/64	5.20	13.00	20.70	4115 28.180
28.500		5.20	13.00	20.70	4115 28.500
28.580		5.30	13.00	20.70	4115 28.580
29.000		5.30	13.00	20.70	4115 29.000
29.370	1 5/32	5.40	13.00	20.70	4115 29.370
29.500		5.40	13.00	20.70	4115 29.500
29.600		5.40	13.00	20.70	4115 29.600
29.770	1 11/64	5.50	13.00	20.70	4115 29.770
30.000		5.50	14.00	22.30	4115 30.000

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
30.160	1 3/16	5.50	14.00	22.30	4115 30.160
30.500		5.60	14.00	22.30	4115 30.500
30.960	1 7/32	5.70	14.00	22.30	4115 30.960
31.000		5.70	14.00	22.30	4115 31.000
31.500		5.80	14.00	22.30	4115 31.500
31.750	1 1/4	5.80	14.00	22.30	4115 31.750
32.000		5.90	15.00	23.10	4115 32.000
32.500		6.00	15.00	23.10	4115 32.500
32.540	1 9/32	6.00	15.00	23.10	4115 32.540
32.940	1 19/64	6.00	15.00	23.10	4115 32.940
33.000		6.10	15.00	23.10	4115 33.000
33.340	1 5/16	6.10	15.00	23.10	4115 33.340
33.500		6.10	15.00	23.10	4115 33.500
34.000		6.20	15.00	23.10	4115 34.000
34.130	1 11/32	6.30	15.00	23.10	4115 34.130
34.500		6.30	15.00	23.10	4115 34.500
34.930		6.40	15.00	23.10	4115 34.930
35.000		6.40	15.00	23.10	4115 35.000
35.500		6.50	15.00	23.10	4115 35.500
35.720	1 13/32	6.60	15.00	23.10	4115 35.720
36.000		6.60	16.00	23.90	4115 36.000
36.500		6.70	16.00	23.90	4115 36.500
36.510	1 7/16	6.70	16.00	23.90	4115 36.510
37.000		6.80	16.00	23.90	4115 37.000
37.310	1 15/32	6.80	16.00	23.90	4115 37.310
37.500		6.90	16.00	23.90	4115 37.500
38.000		7.00	16.00	23.90	4115 38.000
38.100	1 1/2	7.00	16.00	23.90	4115 38.100
38.500	1 33/64	7.10	16.00	23.90	4115 38.500
39.000		7.10	16.00	23.90	4115 39.000
39.500		7.20	16.00	23.90	4115 39.500
40.000		7.30	16.00	23.90	4115 40.000

Interchangeable inserts HT 800

HT 800 WP | WN | R | 160° 125° | h7

Tool material	**Solid carbide**
Surface	F

P • facet point grind • main cutting edge form concave • special point geometry with 160° point angle and 125° centre point • clamping screws art. no. 4071 included

M

K

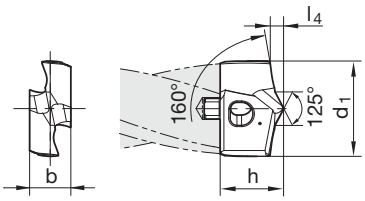
N application for the machining of structural steel components

S

H

GÜHRINGNAVIGATOR

Cutting data page 308-313





Article no. **4229**

d1		l4	b	h	Order no.
mm	inch	mm	mm	mm	
12.000		1.70	5.00	7.50	4229 12.000
12.700	1/2	2.00	5.00	7.50	4229 12.700
14.000		2.00	6.00	9.50	4229 14.000
14.290	9/16	2.30	6.00	9.50	4229 14.290
15.870	5/8	2.30	6.00	9.60	4229 15.870
16.000		2.30	7.00	10.80	4229 16.000
17.460	11/16	2.60	7.00	10.80	4229 17.460
18.000		2.60	8.00	12.30	4229 18.000
19.050	3/4	2.90	8.00	12.30	4229 19.050
20.000		2.90	9.00	13.60	4229 20.000
20.640	13/16	3.00	9.00	13.60	4229 20.640
21.000		3.00	9.00	13.60	4229 21.000
22.000		3.20	10.00	14.90	4229 22.000
22.220	7/8	3.50	10.00	14.90	4229 22.220
23.810	15/16	3.50	10.00	15.00	4229 23.810
24.000		3.50	11.00	15.50	4229 24.000
25.000	63/64	3.60	11.00	15.50	4229 25.000
25.400	1	3.80	11.00	15.50	4229 25.400
26.000		3.80	12.00	18.50	4229 26.000
27.000		3.90	12.00	18.60	4229 27.000
28.000		4.10	13.00	19.80	4229 28.000
28.580	1 1/8	4.20	13.00	19.80	4229 28.580
29.000		4.20	13.00	19.80	4229 29.000
30.000		4.40	14.00	19.90	4229 30.000
30.160	1 3/16	4.60	14.00	19.90	4229 30.160
31.750	1 1/4	4.60	14.00	20.60	4229 31.750
32.000		4.60	15.00	21.30	4229 32.000
33.000		4.80	15.00	21.70	4229 33.000
33.340	1 5/16	4.90	15.00	21.70	4229 33.340
34.000		4.90	15.00	22.20	4229 34.000
34.930	1 3/8	5.20	15.00	22.20	4229 34.930
36.000		5.20	16.00	22.50	4229 36.000
36.510	1 7/16	5.50	16.00	22.50	4229 36.510
38.000		5.50	16.00	23.00	4229 38.000
38.100	1 1/2	5.80	16.00	23.00	4229 38.100
40.000		5.80	16.00	23.10	4229 40.000

EB 80 XXL

+ large selection of solid carbide and carbide-tipped deep hole drills for all common materials
+ polished, long flute for use in steel and non-ferrous metals with excellent chip control and excellent wear protection



EB 100 M single-fluted gun drills

25xD | EB 100 M | WN | R | h5 | 48 HRC

Tool material	Solid carbide
Surface	a
Shank form	HA

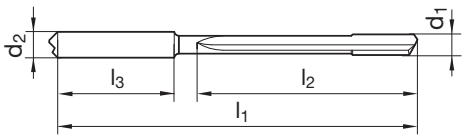
P	•
M	•
K	○
N	○
S	○
H	○

solid carbide shank with MQL shank end • head form G



GÜHRINGNAVIGATOR

Cutting data page 304



Article no. **5646**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
1.000		3.00	65.00	32.00	28.00	5646 1.000
1.191	3/64	3.00	70.00	39.00	28.00	5646 1.190
1.500		4.00	80.00	49.00	28.00	5646 1.500
1.588	1/16	4.00	85.00	51.00	28.00	5646 1.590
1.984	5/64	4.00	95.00	64.00	28.00	5646 1.980
2.000		4.00	95.00	65.00	28.00	5646 2.000
2.381	3/32	4.00	100.00	70.00	28.00	5646 2.380
2.500		4.00	115.00	85.00	28.00	5646 2.500
2.778	7/64	4.00	115.00	85.00	28.00	5646 2.780
3.000		6.00	145.00	105.00	36.00	5646 3.000
3.175	1/8	6.00	145.00	105.00	36.00	5646 3.170
3.500		6.00	145.00	105.00	36.00	5646 3.500
3.572	9/64	6.00	160.00	120.00	36.00	5646 3.570
3.969	5/32	6.00	160.00	120.00	36.00	5646 3.970
4.000		6.00	160.00	120.00	36.00	5646 4.000
4.366	11/64	6.00	220.00	180.00	36.00	5646 4.370
4.763	3/16	6.00	220.00	180.00	36.00	5646 4.760
5.000		6.00	220.00	180.00	36.00	5646 5.000
5.159	13/64	6.00	220.00	180.00	36.00	5646 5.160
5.556	7/32	6.00	220.00	180.00	36.00	5646 5.560
5.953	15/64	6.00	220.00	180.00	36.00	5646 5.950
6.000		6.00	220.00	180.00	36.00	5646 6.000
6.350	1/4	8.00	260.00	210.00	36.00	5646 6.350
6.500		8.00	260.00	210.00	36.00	5646 6.500
6.747	17/64	8.00	260.00	210.00	36.00	5646 6.750
7.000		8.00	260.00	210.00	36.00	5646 7.000
7.144	9/32	8.00	285.00	240.00	36.00	5646 7.140
7.541	19/64	8.00	285.00	240.00	36.00	5646 7.540
7.938	5/16	8.00	285.00	240.00	36.00	5646 7.940
8.000		8.00	285.00	240.00	36.00	5646 8.000
9.000		10.00	350.00	300.00	40.00	5646 9.000
10.000		10.00	350.00	300.00	40.00	5646 10.000
11.000		12.00	420.00	360.00	45.00	5646 11.000
11.113	7/16	12.00	420.00	360.00	45.00	5646 11.113
12.000		12.00	420.00	360.00	45.00	5646 12.000
12.700	1/2	14.00	455.00	396.00	45.00	5646 12.700
14.000		14.00	500.00	437.00	45.00	5646 14.000
15.000		16.00	535.00	468.00	48.00	5646 15.000
15.875	5/8	16.00	560.00	495.00	48.00	5646 15.875
16.000		16.00	565.00	499.00	48.00	5646 16.000

EB 100 M single-fluted gun drills

50xD | EB 100 M | WN | R | h5 | 48 HRC

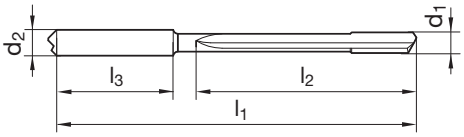
Tool material	**Solid carbide**
Surface	a
Shank form	HA

P	•
M	•
K	○
N	○
S	○
H	○

solid carbide shank with MQL shank end • head form G

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5647**

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
1.000		3.00	90.00	57.00	28.00	5647 1.000
1.191	3/64	3.00	100.00	68.00	28.00	5647 1.190
1.500		4.00	120.00	86.00	28.00	5647 1.500
1.588	1/16	4.00	125.00	91.00	28.00	5647 1.590
1.984	5/64	4.00	145.00	114.00	28.00	5647 1.980
2.000		4.00	145.00	115.00	28.00	5647 2.000
2.381	3/32	4.00	160.00	130.00	28.00	5647 2.380
2.500		4.00	185.00	155.00	28.00	5647 2.500
2.778	7/64	4.00	185.00	155.00	28.00	5647 2.780
3.000		6.00	230.00	190.00	36.00	5647 3.000
3.175	1/8	6.00	230.00	190.00	36.00	5647 3.170
3.500		6.00	230.00	190.00	36.00	5647 3.500
3.572	9/64	6.00	260.00	220.00	36.00	5647 3.570
3.969	5/32	6.00	260.00	220.00	36.00	5647 3.970
4.000		6.00	260.00	220.00	36.00	5647 4.000
4.366	11/64	6.00	290.00	245.00	36.00	5647 4.370
4.763	3/16	6.00	310.00	268.00	36.00	5647 4.760
5.000		6.00	370.00	330.00	36.00	5647 5.000
5.159	13/64	6.00	370.00	330.00	36.00	5647 5.160
5.556	7/32	6.00	370.00	330.00	36.00	5647 5.560
5.953	15/64	6.00	370.00	330.00	36.00	5647 5.950
6.000		6.00	370.00	330.00	36.00	5647 6.000
6.350	1/4	8.00	430.00	385.00	36.00	5647 6.350
6.500		8.00	430.00	385.00	36.00	5647 6.500
6.747	17/64	8.00	430.00	385.00	36.00	5647 6.750
7.000		8.00	430.00	385.00	36.00	5647 7.000
7.144	9/32	8.00	485.00	440.00	36.00	5647 7.140
7.541	19/64	8.00	485.00	440.00	36.00	5647 7.540
7.938	5/16	8.00	485.00	440.00	36.00	5647 7.940
8.000		8.00	485.00	440.00	36.00	5647 8.000
9.000		10.00	555.00	506.00	40.00	5647 9.000
10.000		10.00	615.00	562.00	40.00	5647 10.000

EB 100 M single-fluted gun drills

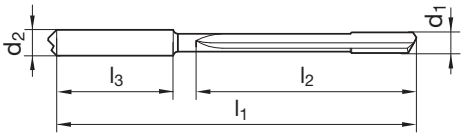
75xD | EB 100 M | WN | R | h5 | 48 HRC

Tool material	Solid carbide
Surface	a
Shank form	HA

P	•
M	•
K	○
N	○
S	○
H	○

solid carbide shank with MQL shank end • head form G

GÜHRINGNAVIGATOR
Cutting data page 304





Article no. **5648**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
1.000		3.00	115.00	82.00	28.00	5648 1.000
1.191	3/64	3.00	130.00	98.00	28.00	5648 1.190
1.500		4.00	155.00	124.00	28.00	5648 1.500
1.588	1/16	4.00	165.00	131.00	28.00	5648 1.590
1.984	5/64	4.00	195.00	163.00	28.00	5648 1.980
2.000		4.00	195.00	165.00	28.00	5648 2.000
2.381	3/32	4.00	220.00	190.00	28.00	5648 2.380
2.500		4.00	255.00	220.00	28.00	5648 2.500
2.778	7/64	4.00	255.00	220.00	28.00	5648 2.780
3.000		6.00	290.00	247.00	36.00	5648 3.000
3.175	1/8	6.00	320.00	280.00	36.00	5648 3.170
3.500		6.00	320.00	280.00	36.00	5648 3.500
3.572	9/64	6.00	360.00	320.00	36.00	5648 3.570
3.969	5/32	6.00	360.00	320.00	36.00	5648 3.970
4.000		6.00	360.00	320.00	36.00	5648 4.000
4.366	11/64	6.00	395.00	355.00	36.00	5648 4.370
4.763	3/16	6.00	430.00	387.00	36.00	5648 4.760
5.000		6.00	450.00	406.00	36.00	5648 5.000
5.159	13/64	6.00	465.00	419.00	36.00	5648 5.160
5.556	7/32	6.00	525.00	485.00	36.00	5648 5.560
5.953	15/64	6.00	525.00	485.00	36.00	5648 5.950
6.000		6.00	525.00	485.00	36.00	5648 6.000
6.350	1/4	8.00	560.00	516.00	36.00	5648 6.350
6.500		8.00	575.00	528.00	36.00	5648 6.500
6.747	17/64	8.00	595.00	548.00	36.00	5648 6.750
7.000		8.00	615.00	568.00	36.00	5648 7.000
7.144	9/32	8.00	625.00	580.00	36.00	5648 7.140

EB 80 single-fluted gun drills

20xD | EB 80 | WN | R | h5 | 48 HRC

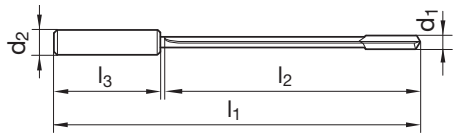
Tool material	Carbide
Surface	C
Shank form	HA

P	○
M	•
K	○
N	○
S	•
H	○

head form G

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. 5639

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.969	5/32	10.00	150.00	100.00	40.00	5639 3.970
4.000		12.00	150.00	100.00	45.00	5639 4.000
4.200		12.00	160.00	110.00	45.00	5639 4.200
4.500		12.00	170.00	120.00	45.00	5639 4.500
5.000		16.00	180.00	130.00	48.00	5639 5.000
5.159	13/64	16.00	180.00	130.00	48.00	5639 5.156
5.500		16.00	190.00	140.00	48.00	5639 5.500
6.000		16.00	210.00	160.00	48.00	5639 6.000
6.350	1/4	16.00	220.00	170.00	48.00	5639 6.350
6.500		16.00	220.00	170.00	48.00	5639 6.500
7.000		16.00	235.00	185.00	48.00	5639 7.000
7.500		16.00	245.00	195.00	48.00	5639 7.500
7.938	5/16	16.00	260.00	210.00	48.00	5639 7.938
8.000		16.00	260.00	210.00	48.00	5639 8.000
8.500		16.00	275.00	220.00	48.00	5639 8.500
9.000		16.00	280.00	230.00	48.00	5639 9.000
9.500		16.00	300.00	245.00	48.00	5639 9.500
9.525	3/8	16.00	290.00	240.00	48.00	5639 9.525
10.000		20.00	320.00	260.00	50.00	5639 10.000
10.500		20.00	330.00	275.00	50.00	5639 10.500
11.000		20.00	340.00	290.00	50.00	5639 11.000
11.113	7/16	20.00	340.00	290.00	50.00	5639 11.113
11.500		20.00	355.00	300.00	50.00	5639 11.500
12.000		20.00	370.00	310.00	50.00	5639 12.000
12.500		20.00	380.00	325.00	50.00	5639 12.500
12.700	1/2	20.00	385.00	330.00	50.00	5639 12.700
13.000		20.00	390.00	335.00	50.00	5639 13.000
13.500		20.00	395.00	340.00	50.00	5639 13.500
14.000		20.00	400.00	345.00	50.00	5639 14.000
14.500		25.00	420.00	355.00	56.00	5639 14.500
15.000		25.00	430.00	370.00	56.00	5639 15.000
15.500		25.00	445.00	380.00	56.00	5639 15.500
16.000		25.00	455.00	395.00	56.00	5639 16.000

EB 80 single-fluted gun drills

30xD | EB 80 | WN | R | h5 | 48 HRC

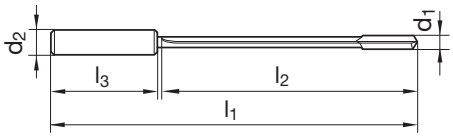
Tool material	Carbide
Surface	C
Shank form	HA

P	○
M	•
K	○
N	○
S	•
H	○

head form G

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5640**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.969	5/32	10.00	200.00	155.00	40.00	5640 3.970
4.000		12.00	200.00	155.00	45.00	5640 4.000
4.200		12.00	210.00	165.00	45.00	5640 4.200
4.500		12.00	220.00	175.00	45.00	5640 4.500
5.000		16.00	230.00	182.00	48.00	5640 5.000
5.159	13/64	16.00	230.00	182.00	48.00	5640 5.156
5.500		16.00	245.00	197.00	48.00	5640 5.500
6.000		16.00	260.00	212.00	48.00	5640 6.000
6.350	1/4	16.00	275.00	227.00	48.00	5640 6.350
6.500		16.00	275.00	227.00	48.00	5640 6.500
7.000		16.00	290.00	242.00	48.00	5640 7.000
7.500		16.00	320.00	270.00	48.00	5640 7.500
7.938	5/16	16.00	320.00	272.00	48.00	5640 7.938
8.000		16.00	320.00	272.00	48.00	5640 8.000
8.500		16.00	360.00	305.00	48.00	5640 8.500
9.000		16.00	350.00	302.00	48.00	5640 9.000
9.500		16.00	395.00	340.00	48.00	5640 9.500
9.525	3/8	16.00	380.00	330.00	48.00	5640 9.525
10.000		20.00	400.00	350.00	50.00	5640 10.000
10.500		20.00	435.00	380.00	50.00	5640 10.500
11.000		20.00	430.00	380.00	50.00	5640 11.000
11.113	7/16	20.00	430.00	380.00	50.00	5640 11.113
11.500		20.00	470.00	415.00	50.00	5640 11.500
12.000		20.00	450.00	400.00	50.00	5640 12.000
12.500		20.00	505.00	450.00	50.00	5640 12.500
12.700	1/2	20.00	500.00	450.00	50.00	5640 12.700
13.000		20.00	520.00	465.00	50.00	5640 13.000
13.500		20.00	530.00	475.00	50.00	5640 13.500
14.000		20.00	540.00	485.00	50.00	5640 14.000
14.500		25.00	565.00	500.00	56.00	5640 14.500
15.000		25.00	580.00	520.00	56.00	5640 15.000
15.500		25.00	600.00	535.00	56.00	5640 15.500
16.000		25.00	615.00	555.00	56.00	5640 16.000

EB 80 single-fluted gun drills

40xD | EB 80 | WN | R | h5 | 48 HRC

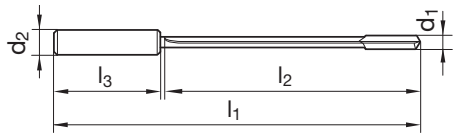
Tool material	Carbide
Surface	C
Shank form	HA

P	○
M	•
K	○
N	○
S	•
H	○

head form G

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5641**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.969	5/32	10.00	230.00	185.00	40.00	5641 3.970
4.000		12.00	230.00	185.00	45.00	5641 4.000
4.200		12.00	240.00	195.00	45.00	5641 4.200
4.500		12.00	250.00	205.00	45.00	5641 4.500
5.000		16.00	280.00	232.00	48.00	5641 5.000
5.159	13/64	16.00	280.00	232.00	48.00	5641 5.156
5.500		16.00	300.00	252.00	48.00	5641 5.500
6.000		16.00	320.00	272.00	48.00	5641 6.000
6.350	1/4	16.00	340.00	292.00	48.00	5641 6.350
6.500		16.00	340.00	292.00	48.00	5641 6.500
7.000		16.00	370.00	322.00	48.00	5641 7.000
7.500		16.00	395.00	345.00	48.00	5641 7.500
7.938	5/16	16.00	420.00	372.00	48.00	5641 7.938
8.000		16.00	420.00	372.00	48.00	5641 8.000
8.500		16.00	445.00	390.00	48.00	5641 8.500
9.000		16.00	450.00	402.00	48.00	5641 9.000
9.500		16.00	490.00	435.00	48.00	5641 9.500
9.525	3/8	16.00	480.00	432.00	48.00	5641 9.525
10.000		20.00	510.00	460.00	50.00	5641 10.000
10.500		20.00	540.00	485.00	50.00	5641 10.500
11.000		20.00	550.00	500.00	50.00	5641 11.000
11.113	7/16	20.00	550.00	500.00	50.00	5641 11.113
11.500		20.00	585.00	530.00	50.00	5641 11.500
12.000		20.00	600.00	550.00	50.00	5641 12.000
12.500		20.00	630.00	575.00	50.00	5641 12.500
12.700	1/2	20.00	635.00	585.00	50.00	5641 12.700
13.000		20.00	650.00	595.00	50.00	5641 13.000
13.500		20.00	660.00	605.00	50.00	5641 13.500
14.000		20.00	680.00	625.00	50.00	5641 14.000
14.500		25.00	710.00	645.00	56.00	5641 14.500
15.000		25.00	730.00	670.00	56.00	5641 15.000
15.500		25.00	755.00	690.00	56.00	5641 15.500
16.000		25.00	775.00	715.00	56.00	5641 16.000

EB 80 single-fluted gun drills

60xD | EB 80 | WN | R | h5 | 48 HRC

Tool material	Carbide
Surface	C
Shank form	HA

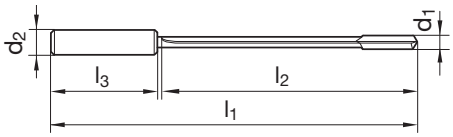
P	○
M	•
K	○
N	○
S	•
H	○

head form G

max. flute length per tool 40xD, for larger drilling depths apply art. no. 5641 as first tool

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5669**

d1		d2 h6	l1	l2	l3	Order no.
mm	inch	mm	mm	mm	mm	
3.969	5/32	10.00	310.00	265.00	40.00	5669 3.970
4.150		12.00	325.00	275.00	45.00	5669 4.150
4.450		12.00	345.00	295.00	45.00	5669 4.450
4.950		16.00	375.00	325.00	48.00	5669 4.950
5.106		16.00	390.00	335.00	48.00	5669 5.106
5.450		16.00	410.00	360.00	48.00	5669 5.450
5.953	15/64	16.00	445.00	390.00	48.00	5669 5.950
6.300		16.00	470.00	415.00	48.00	5669 6.300
6.450		16.00	480.00	425.00	48.00	5669 6.450
6.950		16.00	510.00	460.00	48.00	5669 6.950
7.450		16.00	545.00	490.00	48.00	5669 7.450
7.888		16.00	575.00	520.00	48.00	5669 7.888
7.950		16.00	575.00	525.00	48.00	5669 7.950
8.450		16.00	610.00	555.00	48.00	5669 8.450
8.950		16.00	645.00	590.00	48.00	5669 8.950
9.450		16.00	675.00	625.00	48.00	5669 9.450
9.475		16.00	680.00	625.00	48.00	5669 9.475
9.950		20.00	710.00	655.00	50.00	5669 9.950
10.450		20.00	745.00	690.00	50.00	5669 10.450
10.950		20.00	780.00	725.00	50.00	5669 10.950
11.063		20.00	785.00	730.00	50.00	5669 11.063
11.450		20.00	810.00	755.00	50.00	5669 11.450
11.950		20.00	845.00	790.00	50.00	5669 11.950
12.450		20.00	875.00	820.00	50.00	5669 12.450
12.650		20.00	890.00	835.00	50.00	5669 12.650
12.950		20.00	910.00	855.00	50.00	5669 12.950
13.450		20.00	925.00	870.00	50.00	5669 13.450
13.950		20.00	955.00	900.00	50.00	5669 13.950
14.450		25.00	995.00	935.00	56.00	5669 14.450
14.950		25.00	1025.00	965.00	56.00	5669 14.950
15.450		25.00	1060.00	1000.00	56.00	5669 15.450
15.950		25.00	1090.00	1030.00	56.00	5669 15.950

EB 80 single-fluted gun drills

80xD | EB 80 | WN | R | h5 | 48 HRC

Tool material	Carbide
Surface	C
Shank form	HA

P	○
M	•
K	○
N	○
S	•
H	○

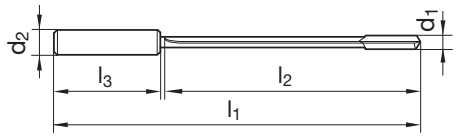
head form G

max. flute length per tool 40xD, for larger drilling depths apply art. no. 5641 as first tool



GÜHRINGNAVIGATOR

Cutting data page 304



Article no. **5642**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.969	5/32	10.00	390.00	345.00	40.00	5642 3.970
4.150		12.00	405.00	355.00	45.00	5642 4.150
4.450		12.00	430.00	380.00	45.00	5642 4.450
4.950		16.00	480.00	432.00	48.00	5642 4.950
5.106		16.00	480.00	432.00	48.00	5642 5.106
5.450		16.00	520.00	470.00	48.00	5642 5.450
5.953	15/64	16.00	560.00	512.00	48.00	5642 5.950
6.300		16.00	590.00	542.00	48.00	5642 6.300
6.450		16.00	605.00	556.00	48.00	5642 6.450
6.950		16.00	650.00	602.00	48.00	5642 6.950
7.450		16.00	695.00	640.00	48.00	5642 7.450
7.888		16.00	740.00	692.00	48.00	5642 7.888
7.950		16.00	740.00	692.00	48.00	5642 7.950
8.450		16.00	780.00	725.00	48.00	5642 8.450
8.950		16.00	820.00	772.00	48.00	5642 8.950
9.450		16.00	865.00	815.00	48.00	5642 9.450
9.475		16.00	870.00	822.00	48.00	5642 9.475
9.950		20.00	910.00	860.00	50.00	5642 9.950
10.450		20.00	955.00	900.00	50.00	5642 10.450
10.950		20.00	995.00	945.00	50.00	5642 10.950
11.063		20.00	995.00	945.00	50.00	5642 11.063
11.450		20.00	1040.00	985.00	50.00	5642 11.450
11.950		20.00	1080.00	1030.00	50.00	5642 11.950
12.450		20.00	1125.00	1070.00	50.00	5642 12.450
12.650		20.00	1140.00	1090.00	50.00	5642 12.650
12.950		20.00	1170.00	1115.00	50.00	5642 12.950
13.450		20.00	1195.00	1140.00	50.00	5642 13.450
13.950		20.00	1235.00	1180.00	50.00	5642 13.950
14.450		25.00	1285.00	1225.00	56.00	5642 14.450
14.950		25.00	1325.00	1265.00	56.00	5642 14.950
15.450		25.00	1370.00	1310.00	56.00	5642 15.450
15.950		25.00	1410.00	1350.00	56.00	5642 15.950

EB 80 XXL single-fluted gun drills

GL 600 | EB 80 XXL | WN | R | h5 | 48 HRC

Tool material	**Carbide**
Surface	S
Shank form	TBM-SEH

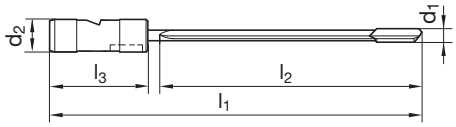
NEW

P	•
M	○
K	•
N	•
S	○
H	○

bright flute • head form G • driver for deep drilling machines

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5688**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		25.00	600.00	500.00	70.00	5688 3.000
4.000		25.00	600.00	500.00	70.00	5688 4.000
5.000		25.00	600.00	500.00	70.00	5688 5.000
6.000		25.00	600.00	500.00	70.00	5688 6.000
7.000		25.00	600.00	500.00	70.00	5688 7.000
8.000		25.00	600.00	500.00	70.00	5688 8.000
9.000		25.00	600.00	500.00	70.00	5688 9.000
10.000		25.00	600.00	500.00	70.00	5688 10.000
11.000		25.00	600.00	500.00	70.00	5688 11.000
11.500		25.00	600.00	500.00	70.00	5688 11.500
12.000		25.00	600.00	500.00	70.00	5688 12.000
13.000		25.00	600.00	500.00	70.00	5688 13.000
14.000		25.00	600.00	500.00	70.00	5688 14.000
15.000		25.00	600.00	500.00	70.00	5688 15.000
16.000		25.00	600.00	500.00	70.00	5688 16.000
17.000		25.00	600.00	500.00	70.00	5688 17.000
18.000		25.00	600.00	500.00	70.00	5688 18.000
19.000		25.00	600.00	500.00	70.00	5688 19.000
20.000		25.00	600.00	500.00	70.00	5688 20.000
21.000		25.00	600.00	500.00	70.00	5688 21.000
22.000		25.00	600.00	500.00	70.00	5688 22.000
23.000		25.00	600.00	500.00	70.00	5688 23.000
24.000		25.00	600.00	500.00	70.00	5688 24.000
25.000	63/64	25.00	600.00	500.00	70.00	5688 25.000

EB 80 XXL single-fluted gun drills

GL 800 | EB 80 XXL | WN | R | h5 | 48 HRC

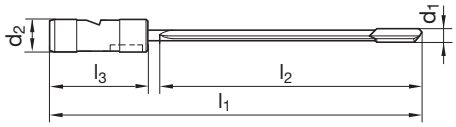
Tool material	**Carbide**
Surface	(S)
Shank form	TBM-SEH

P	•
M	○
K	•
N	•
S	○
H	○

bright flute • head form G • driver for deep drilling machines

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5691**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		25.00	800.00	700.00	70.00	5691 3.000
4.000		25.00	800.00	700.00	70.00	5691 4.000
5.000		25.00	800.00	700.00	70.00	5691 5.000
6.000		25.00	800.00	700.00	70.00	5691 6.000
7.000		25.00	800.00	700.00	70.00	5691 7.000
8.000		25.00	800.00	700.00	70.00	5691 8.000
9.000		25.00	800.00	700.00	70.00	5691 9.000
10.000		25.00	800.00	700.00	70.00	5691 10.000
11.000		25.00	800.00	700.00	70.00	5691 11.000
11.500		25.00	800.00	700.00	70.00	5691 11.500
12.000		25.00	800.00	700.00	70.00	5691 12.000
13.000		25.00	800.00	700.00	70.00	5691 13.000
14.000		25.00	800.00	700.00	70.00	5691 14.000
15.000		25.00	800.00	700.00	70.00	5691 15.000
16.000		25.00	800.00	700.00	70.00	5691 16.000
17.000		25.00	800.00	700.00	70.00	5691 17.000
18.000		25.00	800.00	700.00	70.00	5691 18.000
19.000		25.00	800.00	700.00	70.00	5691 19.000
20.000		25.00	800.00	700.00	70.00	5691 20.000
21.000		25.00	800.00	700.00	70.00	5691 21.000
22.000		25.00	800.00	700.00	70.00	5691 22.000
23.000		25.00	800.00	700.00	70.00	5691 23.000
24.000		25.00	800.00	700.00	70.00	5691 24.000
25.000	63/64	25.00	800.00	700.00	70.00	5691 25.000

EB 80 XXL single-fluted gun drills

GL 1000 | EB 80 XXL | WN | R | h5 | 48 HRC

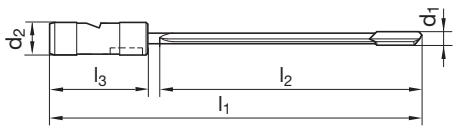
Tool material	Carbide
Surface	S
Shank form	TBM-SEH

P	•
M	○
K	•
N	•
S	○
H	○

bright flute • head form G • driver for deep drilling machines

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5164**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		25.00	1000.00	900.00	70.00	5164 3.000
4.000		25.00	1000.00	900.00	70.00	5164 4.000
5.000		25.00	1000.00	900.00	70.00	5164 5.000
6.000		25.00	1000.00	900.00	70.00	5164 6.000
7.000		25.00	1000.00	900.00	70.00	5164 7.000
8.000		25.00	1000.00	900.00	70.00	5164 8.000
9.000		25.00	1000.00	900.00	70.00	5164 9.000
10.000		25.00	1000.00	900.00	70.00	5164 10.000
11.000		25.00	1000.00	900.00	70.00	5164 11.000
11.500		25.00	1000.00	900.00	70.00	5164 11.500
12.000		25.00	1000.00	900.00	70.00	5164 12.000
13.000		25.00	1000.00	900.00	70.00	5164 13.000
14.000		25.00	1000.00	900.00	70.00	5164 14.000
15.000		25.00	1000.00	900.00	70.00	5164 15.000
16.000		25.00	1000.00	900.00	70.00	5164 16.000
17.000		25.00	1000.00	900.00	70.00	5164 17.000
18.000		25.00	1000.00	900.00	70.00	5164 18.000
19.000		25.00	1000.00	900.00	70.00	5164 19.000
20.000		25.00	1000.00	900.00	70.00	5164 20.000
21.000		25.00	1000.00	900.00	70.00	5164 21.000
22.000		25.00	1000.00	900.00	70.00	5164 22.000
23.000		25.00	1000.00	900.00	70.00	5164 23.000
24.000		25.00	1000.00	900.00	70.00	5164 24.000
25.000	63/64	25.00	1000.00	900.00	70.00	5164 25.000

EB 80 XXL single-fluted gun drills

GL 1200 | EB 80 XXL | WN | R | h5 | 48 HRC

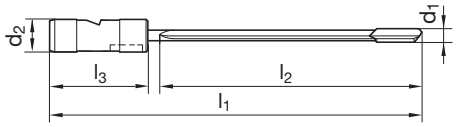
Tool material	**Carbide**
Surface	(S)
Shank form	TBM-SEH

P	•
M	○
K	•
N	•
S	○
H	○

bright flute • head form G • driver for deep drilling machines

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5692**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
3.000		25.00	1200.00	1100.00	70.00	5692 3.000
4.000		25.00	1200.00	1100.00	70.00	5692 4.000
5.000		25.00	1200.00	1100.00	70.00	5692 5.000
6.000		25.00	1200.00	1100.00	70.00	5692 6.000
7.000		25.00	1200.00	1100.00	70.00	5692 7.000
8.000		25.00	1200.00	1100.00	70.00	5692 8.000
9.000		25.00	1200.00	1100.00	70.00	5692 9.000
10.000		25.00	1200.00	1100.00	70.00	5692 10.000
11.000		25.00	1200.00	1100.00	70.00	5692 11.000
11.500		25.00	1200.00	1100.00	70.00	5692 11.500
12.000		25.00	1200.00	1100.00	70.00	5692 12.000
13.000		25.00	1200.00	1100.00	70.00	5692 13.000
14.000		25.00	1200.00	1100.00	70.00	5692 14.000
15.000		25.00	1200.00	1100.00	70.00	5692 15.000
16.000		25.00	1200.00	1100.00	70.00	5692 16.000
17.000		25.00	1200.00	1100.00	70.00	5692 17.000
18.000		25.00	1200.00	1100.00	70.00	5692 18.000
19.000		25.00	1200.00	1100.00	70.00	5692 19.000
20.000		25.00	1200.00	1100.00	70.00	5692 20.000
21.000		25.00	1200.00	1100.00	70.00	5692 21.000
22.000		25.00	1200.00	1100.00	70.00	5692 22.000
23.000		25.00	1200.00	1100.00	70.00	5692 23.000
24.000		25.00	1200.00	1100.00	70.00	5692 24.000
25.000	63/64	25.00	1200.00	1100.00	70.00	5692 25.000

EB 80 XXL single-fluted gun drills

GL 1400 | EB 80 XXL | WN | R | h5 | 48 HRC

Tool material	Carbide
Surface	S
Shank form	TBM-SEH

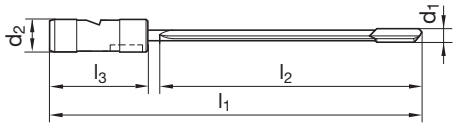
NEW

P	•
M	○
K	•
N	•
S	○
H	○

bright flute • head form G • driver for deep drilling machines

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5681**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.000		25.00	1400.00	1300.00	70.00	5681 4.000
5.000		25.00	1400.00	1300.00	70.00	5681 5.000
6.000		25.00	1400.00	1300.00	70.00	5681 6.000
7.000		25.00	1400.00	1300.00	70.00	5681 7.000
8.000		25.00	1400.00	1300.00	70.00	5681 8.000
9.000		25.00	1400.00	1300.00	70.00	5681 9.000
10.000		25.00	1400.00	1300.00	70.00	5681 10.000
11.000		25.00	1400.00	1300.00	70.00	5681 11.000
11.500		25.00	1400.00	1300.00	70.00	5681 11.500
12.000		25.00	1400.00	1300.00	70.00	5681 12.000
13.000		25.00	1400.00	1300.00	70.00	5681 13.000
14.000		25.00	1400.00	1300.00	70.00	5681 14.000
15.000		25.00	1400.00	1300.00	70.00	5681 15.000
16.000		25.00	1400.00	1300.00	70.00	5681 16.000
17.000		25.00	1400.00	1300.00	70.00	5681 17.000
18.000		25.00	1400.00	1300.00	70.00	5681 18.000
19.000		25.00	1400.00	1300.00	70.00	5681 19.000
20.000		25.00	1400.00	1300.00	70.00	5681 20.000
21.000		25.00	1400.00	1300.00	70.00	5681 21.000
22.000		25.00	1400.00	1300.00	70.00	5681 22.000
23.000		25.00	1400.00	1300.00	70.00	5681 23.000
24.000		25.00	1400.00	1300.00	70.00	5681 24.000
25.000	63/64	25.00	1400.00	1300.00	70.00	5681 25.000

EB 80 XXL single-fluted gun drills

GL 1600 | EB 80 XXL | WN | R | h5 | 48 HRC

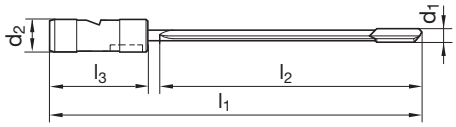
Tool material	Carbide
Surface	S
Shank form	TBM-SEH

P	•
M	○
K	•
N	•
S	○
H	○

bright flute • head form G • driver for deep drilling machines

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5693**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.000		25.00	1600.00	1500.00	70.00	5693 4.000
5.000		25.00	1600.00	1500.00	70.00	5693 5.000
5.500		25.00	1600.00	1500.00	70.00	5693 5.500
6.000		25.00	1600.00	1500.00	70.00	5693 6.000
6.500		25.00	1600.00	1500.00	70.00	5693 6.500
7.000		25.00	1600.00	1500.00	70.00	5693 7.000
7.500		25.00	1600.00	1500.00	70.00	5693 7.500
8.000		25.00	1600.00	1500.00	70.00	5693 8.000
9.000		25.00	1600.00	1500.00	70.00	5693 9.000
9.500		25.00	1600.00	1500.00	70.00	5693 9.500
10.000		25.00	1600.00	1500.00	70.00	5693 10.000
11.000		25.00	1600.00	1500.00	70.00	5693 11.000
11.500		25.00	1600.00	1500.00	70.00	5693 11.500
12.000		25.00	1600.00	1500.00	70.00	5693 12.000
13.000		25.00	1600.00	1500.00	70.00	5693 13.000
14.000		25.00	1600.00	1500.00	70.00	5693 14.000
15.000		25.00	1600.00	1500.00	70.00	5693 15.000
16.000		25.00	1600.00	1500.00	70.00	5693 16.000
17.000		25.00	1600.00	1500.00	70.00	5693 17.000
18.000		25.00	1600.00	1500.00	70.00	5693 18.000
19.000		25.00	1600.00	1500.00	70.00	5693 19.000
20.000		25.00	1600.00	1500.00	70.00	5693 20.000
21.000		25.00	1600.00	1500.00	70.00	5693 21.000
22.000		25.00	1600.00	1500.00	70.00	5693 22.000
23.000		25.00	1600.00	1500.00	70.00	5693 23.000
24.000		25.00	1600.00	1500.00	70.00	5693 24.000
25.000	63/64	25.00	1600.00	1500.00	70.00	5693 25.000

EB 80 XXL single-fluted gun drills

GL 1800 | EB 80 XXL | WN | R | h5 | 48 HRC

Tool material	Carbide
Surface	S
Shank form	TBM-SEH

P	•
M	○
K	•
N	•
S	○
H	○

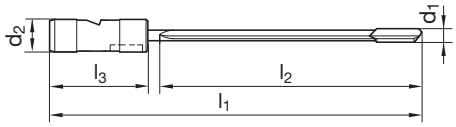
bright flute • head form G • driver for deep drilling machines

NEW



GÜHRINGNAVIGATOR

Cutting data page 304



Article no. **5682**

d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.000		25.00	1800.00	1700.00	70.00	5682 4.000
5.000		25.00	1800.00	1700.00	70.00	5682 5.000
6.000		25.00	1800.00	1700.00	70.00	5682 6.000
7.000		25.00	1800.00	1700.00	70.00	5682 7.000
8.000		25.00	1800.00	1700.00	70.00	5682 8.000
9.000		25.00	1800.00	1700.00	70.00	5682 9.000
10.000		25.00	1800.00	1700.00	70.00	5682 10.000
11.000		25.00	1800.00	1700.00	70.00	5682 11.000
11.500		25.00	1800.00	1700.00	70.00	5682 11.500
12.000		25.00	1800.00	1700.00	70.00	5682 12.000
13.000		25.00	1800.00	1700.00	70.00	5682 13.000
14.000		25.00	1800.00	1700.00	70.00	5682 14.000
15.000		25.00	1800.00	1700.00	70.00	5682 15.000
16.000		25.00	1800.00	1700.00	70.00	5682 16.000
17.000		25.00	1800.00	1700.00	70.00	5682 17.000
18.000		25.00	1800.00	1700.00	70.00	5682 18.000
19.000		25.00	1800.00	1700.00	70.00	5682 19.000
20.000		25.00	1800.00	1700.00	70.00	5682 20.000
21.000		25.00	1800.00	1700.00	70.00	5682 21.000
22.000		25.00	1800.00	1700.00	70.00	5682 22.000
23.000		25.00	1800.00	1700.00	70.00	5682 23.000
24.000		25.00	1800.00	1700.00	70.00	5682 24.000
25.000	63/64	25.00	1800.00	1700.00	70.00	5682 25.000
26.000		25.00	1800.00	1695.00	75.00	5682 26.000
27.000		25.00	1800.00	1695.00	75.00	5682 27.000
28.000		25.00	1800.00	1695.00	75.00	5682 28.000
29.000		25.00	1800.00	1695.00	75.00	5682 29.000
30.000		25.00	1800.00	1695.00	75.00	5682 30.000
31.000		25.00	1800.00	1695.00	75.00	5682 31.000
32.000		25.00	1800.00	1695.00	75.00	5682 32.000

EB 80 XXL single-fluted gun drills

GL 2000 | EB 80 XXL | WN | R | h5 | 48 HRC

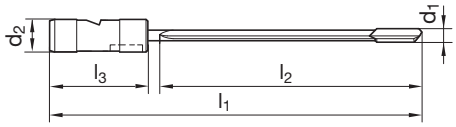
Tool material	Carbide
Surface	S
Shank form	TBM-SEH

P	•
M	○
K	•
N	•
S	○
H	○

bright flute • head form G • driver for deep drilling machines

GÜHRINGNAVIGATOR

Cutting data page 304





Article no. **5694**

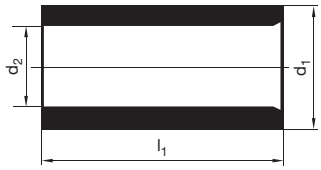
d1 mm	d1 inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
4.000		25.00	2000.00	1900.00	70.00	5694 4.000
5.000		25.00	2000.00	1900.00	70.00	5694 5.000
6.000		25.00	2000.00	1900.00	70.00	5694 6.000
7.000		25.00	2000.00	1900.00	70.00	5694 7.000
8.000		25.00	2000.00	1900.00	70.00	5694 8.000
9.000		25.00	2000.00	1900.00	70.00	5694 9.000
10.000		25.00	2000.00	1900.00	70.00	5694 10.000
11.000		25.00	2000.00	1900.00	70.00	5694 11.000
11.500		25.00	2000.00	1900.00	70.00	5694 11.500
12.000		25.00	2000.00	1900.00	70.00	5694 12.000
13.000		25.00	2000.00	1900.00	70.00	5694 13.000
14.000		25.00	2000.00	1900.00	70.00	5694 14.000
15.000		25.00	2000.00	1900.00	70.00	5694 15.000
16.000		25.00	2000.00	1900.00	70.00	5694 16.000
17.000		25.00	2000.00	1900.00	70.00	5694 17.000
18.000		25.00	2000.00	1900.00	70.00	5694 18.000
19.000		25.00	2000.00	1900.00	70.00	5694 19.000
20.000		25.00	2000.00	1900.00	70.00	5694 20.000
21.000		25.00	2000.00	1900.00	70.00	5694 21.000
22.000		25.00	2000.00	1900.00	70.00	5694 22.000
23.000		25.00	2000.00	1900.00	70.00	5694 23.000
24.000		25.00	2000.00	1900.00	70.00	5694 24.000
25.000	63/64	25.00	2000.00	1900.00	70.00	5694 25.000
26.000		25.00	2000.00	1895.00	75.00	5694 26.000
27.000		25.00	2000.00	1895.00	75.00	5694 27.000
28.000		25.00	2000.00	1895.00	75.00	5694 28.000
29.000		25.00	2000.00	1895.00	75.00	5694 29.000
30.000		25.00	2000.00	1895.00	75.00	5694 30.000
31.000		25.00	2000.00	1895.00	75.00	5694 31.000
32.000		25.00	2000.00	1895.00	75.00	5694 32.000

Drill bushes

WN

Tool material **Solid carbide**

special dimensions on request





Article no. **5748**

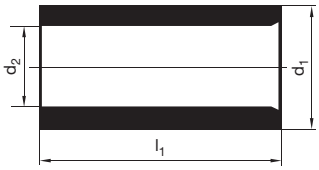
d2 F7	d1 n6	l1	Order no.	d2 F7	d1 n6	l1	Order no.
mm	mm	mm		mm	mm	mm	
0.900	3.000	9.00	5748 0.900	14.020	22.000	28.00	5748 14.020
1.590	4.000	9.00	5748 1.590	14.030	22.000	28.00	5748 14.030
1.600	4.000	9.00	5748 1.600	14.400	22.000	28.00	5748 14.400
1.605	4.000	9.00	5748 1.605	15.020	22.000	28.00	5748 15.020
2.000	5.000	9.00	5748 2.000	16.000	26.000	28.00	5748 16.000
2.030	5.000	9.00	5748 2.030	16.030	26.000	28.00	5748 16.030
2.040	5.000	9.00	5748 2.040	16.200	26.000	28.00	5748 16.200
2.500	5.000	9.00	5748 2.500	18.000	26.000	28.00	5748 18.000
3.000	6.000	12.00	5748 3.000	18.030	26.000	28.00	5748 18.030
3.500	7.000	12.00	5748 3.500	18.050	26.000	28.00	5748 18.050
3.750	7.000	12.00	5748 3.750	18.100	30.000	36.00	5748 18.100
4.000	7.000	12.00	5748 4.000	20.000	30.000	36.00	5748 20.000
4.500	8.000	12.00	5748 4.500	20.030	30.000	36.00	5748 20.030
5.000	8.000	12.00	5748 5.000	22.000	30.000	36.00	5748 22.000
5.200	10.000	16.00	5748 5.200	22.030	30.000	36.00	5748 22.030
5.500	10.000	16.00	5748 5.500	22.120	35.000	36.00	5748 22.120
5.515	10.000	16.00	5748 5.515	23.500	35.000	36.00	5748 23.500
5.525	10.000	16.00	5748 5.525	24.000	35.000	36.00	5748 24.000
6.000	10.000	16.00	5748 6.000	24.030	35.000	36.00	5748 24.030
6.100	12.000	16.00	5748 6.100	25.000	35.000	36.00	5748 25.000
6.900	12.000	16.00	5748 6.900	26.000	35.000	36.00	5748 26.000
7.100	12.000	16.00	5748 7.100	28.000	42.000	45.00	5748 28.000
8.000	12.000	16.00	5748 8.000	30.000	42.000	45.00	5748 30.000
8.015	12.000	16.00	5748 8.015	34.000	48.000	45.00	5748 34.000
8.510	15.000	20.00	5748 8.510	35.000	48.000	45.00	5748 35.000
10.000	15.000	20.00	5748 10.000	40.000	55.000	55.00	5748 40.000
10.100	18.000	20.00	5748 10.100				
10.920	18.000	20.00	5748 10.920				
11.000	18.000	20.00	5748 11.000				
12.000	18.000	20.00	5748 12.000				
12.030	18.000	20.00	5748 12.030				
12.100	22.000	28.00	5748 12.100				
12.600	22.000	28.00	5748 12.600				
13.000	22.000	28.00	5748 13.000				
13.020	22.000	28.00	5748 13.020				
14.000	22.000	28.00	5748 14.000				

Drill bushes

WN

Tool material **HSS**

special dimensions on request





Article no. **5747**

d2 F7 mm	d1 n6 mm	l1 mm	Order no.	d2 F7 mm	d1 n6 mm	l1 mm	Order no.
0.900	3.000	9.00	5747 0.900	5.400	10.000	16.00	5747 5.400
1.110	4.000	9.00	5747 1.110	5.500	10.000	16.00	5747 5.500
1.200	4.000	9.00	5747 1.200	5.600	10.000	16.00	5747 5.600
1.210	4.000	9.00	5747 1.210	5.800	10.000	16.00	5747 5.800
1.310	4.000	9.00	5747 1.310	5.950	10.000	16.00	5747 5.950
1.400	4.000	9.00	5747 1.400	6.000	10.000	16.00	5747 6.000
1.410	4.000	9.00	5747 1.410	6.050	10.000	16.00	5747 6.050
1.510	4.000	9.00	5747 1.510	6.100	12.000	16.00	5747 6.100
1.600	4.000	9.00	5747 1.600	6.300	12.000	16.00	5747 6.300
1.650	4.000	9.00	5747 1.650	6.350	12.000	16.00	5747 6.350
1.710	4.000	9.00	5747 1.710	6.370	12.000	16.00	5747 6.370
1.810	4.000	9.00	5747 1.810	6.450	12.000	16.00	5747 6.450
2.000	5.000	9.00	5747 2.000	6.502	12.000	16.00	5747 6.502
2.200	5.000	9.00	5747 2.200	6.600	12.000	16.00	5747 6.600
2.300	5.000	9.00	5747 2.300	6.730	12.000	16.00	5747 6.730
2.340	5.000	9.00	5747 2.340	6.731	12.000	16.00	5747 6.731
2.500	5.000	9.00	5747 2.500	6.750	12.000	16.00	5747 6.750
2.700	6.000	12.00	5747 2.700	6.800	12.000	16.00	5747 6.800
2.800	6.000	12.00	5747 2.800	6.950	12.000	16.00	5747 6.950
3.000	6.000	12.00	5747 3.000	7.000	12.000	16.00	5747 7.000
3.100	6.000	12.00	5747 3.100	7.100	12.000	16.00	5747 7.100
3.255	6.000	12.00	5747 3.255	7.400	12.000	16.00	5747 7.400
3.300	6.000	12.00	5747 3.300	7.500	12.000	16.00	5747 7.500
3.400	7.000	12.00	5747 3.400	7.550	12.000	16.00	5747 7.550
3.500	7.000	12.00	5747 3.500	7.600	12.000	16.00	5747 7.600
3.650	7.000	12.00	5747 3.650	7.800	12.000	16.00	5747 7.800
3.700	7.000	12.00	5747 3.700	7.830	12.000	16.00	5747 7.830
3.710	7.000	12.00	5747 3.710	7.850	12.000	16.00	5747 7.850
3.800	7.000	12.00	5747 3.800	7.938	12.000	16.00	5747 7.938
4.000	7.000	12.00	5747 4.000	8.000	12.000	16.00	5747 8.000
4.100	8.000	12.00	5747 4.100	8.020	12.000	16.00	5747 8.020
4.300	8.000	12.00	5747 4.300	8.050	12.000	16.00	5747 8.050
4.500	8.000	12.00	5747 4.500	8.100	15.000	20.00	5747 8.100
4.600	8.000	12.00	5747 4.600	8.500	15.000	20.00	5747 8.500
4.760	8.000	12.00	5747 4.760	8.530	15.000	20.00	5747 8.530
4.763	8.000	12.00	5747 4.763	8.800	15.000	20.00	5747 8.800
4.800	8.000	12.00	5747 4.800	8.950	15.000	20.00	5747 8.950
5.000	8.000	12.00	5747 5.000	9.000	15.000	20.00	5747 9.000
5.020	8.000	12.00	5747 5.020	9.100	15.000	20.00	5747 9.100
5.100	10.000	16.00	5747 5.100	9.200	15.000	20.00	5747 9.200
5.200	10.000	16.00	5747 5.200	9.300	15.000	20.00	5747 9.300
5.300	10.000	16.00	5747 5.300	9.500	15.000	20.00	5747 9.500

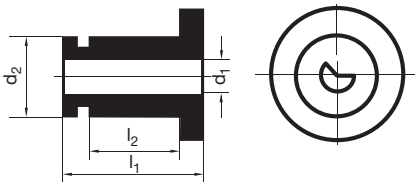
d2 F7	d1 n6	l1	Order no.
mm	mm	mm	
9.525	15.000	20.00	5747 9.525
9.530	15.000	20.00	5747 9.530
9.570	15.000	20.00	5747 9.570
9.652	15.000	20.00	5747 9.652
9.800	15.000	20.00	5747 9.800
10.000	15.000	20.00	5747 10.000
10.100	18.000	20.00	5747 10.100
10.420	18.000	20.00	5747 10.420
10.600	18.000	20.00	5747 10.600
10.725	18.000	20.00	5747 10.725
11.000	18.000	20.00	5747 11.000
11.080	18.000	20.00	5747 11.080
11.100	18.000	20.00	5747 11.100
11.113	18.000	20.00	5747 11.113
11.500	18.000	20.00	5747 11.500
11.600	18.000	20.00	5747 11.600
12.000	18.000	20.00	5747 12.000
12.020	18.000	20.00	5747 12.020
12.100	22.000	28.00	5747 12.100
12.530	22.000	28.00	5747 12.530
12.600	22.000	28.00	5747 12.600
12.700	22.000	28.00	5747 12.700
12.800	22.000	28.00	5747 12.800
12.954	22.000	28.00	5747 12.954
13.000	22.000	28.00	5747 13.000
13.400	22.000	28.00	5747 13.400
13.500	22.000	28.00	5747 13.500
13.700	22.000	28.00	5747 13.700
13.800	22.000	28.00	5747 13.800
14.000	22.000	28.00	5747 14.000
14.310	22.000	28.00	5747 14.310
14.620	22.000	28.00	5747 14.620
14.770	22.000	28.00	5747 14.770
15.000	22.000	28.00	5747 15.000
15.875	26.000	28.00	5747 15.875
16.000	26.000	28.00	5747 16.000

d2 F7	d1 n6	l1	Order no.
mm	mm	mm	
16.330	26.000	28.00	5747 16.330
17.040	26.000	28.00	5747 17.040
17.080	26.000	28.00	5747 17.080
18.000	26.000	28.00	5747 18.000
18.100	30.000	36.00	5747 18.100
18.255	30.000	36.00	5747 18.255
18.450	30.000	36.00	5747 18.450
19.000	30.000	36.00	5747 19.000
19.050	30.000	36.00	5747 19.050
19.300	30.000	36.00	5747 19.300
19.500	30.000	36.00	5747 19.500
19.700	30.000	36.00	5747 19.700
20.000	30.000	36.00	5747 20.000
21.050	30.000	36.00	5747 21.050
22.000	30.000	36.00	5747 22.000
22.100	35.000	36.00	5747 22.100
22.120	35.000	36.00	5747 22.120
22.225	35.000	36.00	5747 22.225
23.500	35.000	36.00	5747 23.500
24.000	35.000	36.00	5747 24.000
24.500	35.000	36.00	5747 24.500
25.000	35.000	36.00	5747 25.000
25.250	35.000	36.00	5747 25.250
25.400	35.000	36.00	5747 25.400
26.000	35.000	36.00	5747 26.000
28.000	42.000	45.00	5747 28.000
28.169	42.000	45.00	5747 28.169
30.000	42.000	45.00	5747 30.000
30.100	48.000	45.00	5747 30.100
32.000	48.000	45.00	5747 32.000
34.000	48.000	45.00	5747 34.000
35.000	48.000	45.00	5747 35.000
38.100	55.000	56.00	5747 38.100
39.000	55.000	56.00	5747 39.000
40.000	55.000	56.00	5747 40.000

Moulded steady rest bushings for single-fluted gun drills

WN

special dimensions on request • d1 = gun drill nominal diameter





Article no. **5750**

d1	d2 n6	l1	l2	Order no.
	mm	mm	mm	
2.000-2.099	20	20	12	5750 201.900
2,100-2,199	20	20	12	5750 202.000
2.200-2.299	20	20	12	5750 202.100
2.300-2.399	20	20	12	5750 202.200
2,400-2,499	20	20	12	5750 202.300
2,500-2,599	20	20	12	5750 202.400
2,600-2,699	20	20	12	5750 202.500
2.700-2.799	20	20	12	5750 202.600
2.800-2.899	20	20	12	5750 202.700
2.900-3.099	20	20	12	5750 202.800
3.100-3.359	20	20	12	5750 203.000
3,360-3,459	20	20	12	5750 203.200
3.460-3.559	20	20	12	5750 203.300
3.560-3.799	20	20	12	5750 203.400
3.800-3.959	20	20	12	5750 203.600
3.960-4.259	20	20	12	5750 203.700
4.260-4.499	20	20	12	5750 204.000
4.500-4.749	20	20	12	5750 204.200
4.750-4.999	20	20	12	5750 204.500
5.000-5.249	20	20	12	5750 204.700
5.250-5.499	20	20	12	5750 205.000
5.500-5.749	20	20	12	5750 205.200
5.750-5.999	20	20	12	5750 205.500
6.000-6.249	20	20	12	5750 205.700
6.250-6.449	20	20	12	5750 206.000
6.450-6.749	20	20	12	5750 206.200
6.750-6.999	20	20	12	5750 206.500
7.000-7.299	20	20	12	5750 206.700
7.300-7.599	20	20	12	5750 207.000
7.600-7.799	20	20	12	5750 207.300
7.800-7.999	20	20	12	5750 207.500
8.000-8.299	20	20	12	5750 207.700
8.300-8.699	20	20	12	5750 208.000
8.700-8.999	20	20	12	5750 208.400
9.000-9.299	20	20	12	5750 208.700
9.300-9.699	20	20	12	5750 209.000
9.700-9.999	20	20	12	5750 209.400
10.000-10.299	20	20	12	5750 209.700
10.300-10.799	20	20	12	5750 210.000
10.800-11.299	20	20	12	5750 210.500
11.300-11.799	20	20	12	5750 211.000
11.800-12.399	20	20	12	5750 211.500
2.900-3.099	30	26	14	5750 302.800
3.100-3.359	30	26	14	5750 303.000
3,360-3,459	30	26	14	5750 303.200
3.460-3.559	30	26	14	5750 303.300
3.560-3.799	30	26	14	5750 303.400
3.800-3.959	30	26	14	5750 303.600

d1	d2 n6	l1	l2	Order no.
	mm	mm	mm	
3.960-4.259	30	26	14	5750 303.700
4.260-4.499	30	26	14	5750 304.000
4.500-4.749	30	26	14	5750 304.200
4.750-4.999	30	26	14	5750 304.500
5.000-5.249	30	26	14	5750 304.700
5.250-5.499	30	26	14	5750 305.000
5.500-5.749	30	26	14	5750 305.200
5.750-5.999	30	26	14	5750 305.500
6.000-6.249	30	26	14	5750 305.700
6.250-6.449	30	26	14	5750 306.000
6.450-6.749	30	26	14	5750 306.200
6.750-6.999	30	26	14	5750 306.500
7.000-7.299	30	26	14	5750 306.700
7.300-7.599	30	26	14	5750 307.000
7.600-7.799	30	26	14	5750 307.300
7.800-7.999	30	26	14	5750 307.500
8.000-8.299	30	26	14	5750 307.700
8.300-8.699	30	26	14	5750 308.000
8.700-8.999	30	26	14	5750 308.400
9.000-9.299	30	26	14	5750 308.700
9.300-9.699	30	26	14	5750 309.000
9.700-9.999	30	26	14	5750 309.400
10.000-10.299	30	26	14	5750 309.700
10.300-10.799	30	26	14	5750 310.000
10.800-11.299	30	26	14	5750 310.500
11.300-11.799	30	26	14	5750 311.000
11.800-12.399	30	26	14	5750 311.500
12.400-12.899	30	26	14	5750 312.000
12.900-13.399	30	26	14	5750 312.500
13,400-13,899	30	26	14	5750 313.000
13.900-14.399	30	26	14	5750 313.500
14.400-14.899	30	26	14	5750 314.000
14.900-15.399	30	26	14	5750 314.500
15.400-15.899	30	26	14	5750 315.000
15.900-16.399	30	26	14	5750 315.500
16,400-16,899	30	26	14	5750 316.000
16.900-17.399	30	26	14	5750 316.500
17.400-17.899	30	26	14	5750 317.000
17.900-18.399	30	26	14	5750 317.500
18.400-19.509	30	26	14	5750 318.000
19.510-20.509	30	26	14	5750 319.000
20.510-21.509	30	26	14	5750 320.000
21.510-22.609	30	26	14	5750 321.000
22.610-23.609	30	26	14	5750 322.000
23.610-24.609	30	26	14	5750 323.000
24.610-25.609	30	26	14	5750 324.000
3.100-3.359	45	26	16	5750 403.000
3,360-3,459	45	26	16	5750 403.200

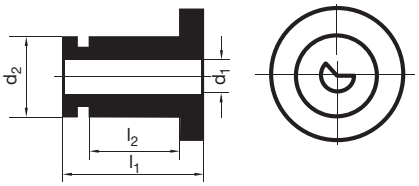
d1	d2 n6	l1	l2	Order no.
	mm	mm	mm	
3.460-3.559	45	26	16	5750 403.300
3.560-3.799	45	26	16	5750 403.400
3.800-3.959	45	26	16	5750 403.600
3.960-4.259	45	26	16	5750 403.700
4.260-4.499	45	26	16	5750 404.000
4.500-4.749	45	26	16	5750 404.200
4.750-4.999	45	26	16	5750 404.500
5.000-5.249	45	26	16	5750 404.700
5.250-5.499	45	26	16	5750 405.000
5.500-5.749	45	26	16	5750 405.200
5.750-5.999	45	26	16	5750 405.500
6.000-6.249	45	26	16	5750 405.700
6.250-6.449	45	26	16	5750 406.000
6.450-6.749	45	26	16	5750 406.200
6.750-6.999	45	26	16	5750 406.500
7.000-7.299	45	26	16	5750 406.700
7.300-7.599	45	26	16	5750 407.000
7.600-7.799	45	26	16	5750 407.300
7.800-7.999	45	26	16	5750 407.500
8.000-8.299	45	26	16	5750 407.700
8.300-8.699	45	26	16	5750 408.000
8.700-8.999	45	26	16	5750 408.400
9.000-9.299	45	26	16	5750 408.700
9.300-9.699	45	26	16	5750 409.000
9.700-9.999	45	26	16	5750 409.400
10.000-10.299	45	26	16	5750 409.700
10.300-10.799	45	26	16	5750 410.000
10.800-11.299	45	26	16	5750 410.500
11.300-11.799	45	26	16	5750 411.000
11.800-12.399	45	26	16	5750 411.500
12.400-12.899	45	26	16	5750 412.000
12.900-13.399	45	26	16	5750 412.500
13,400-13,899	45	26	16	5750 413.000
13.900-14.399	45	26	16	5750 413.500
14.400-14.899	45	26	16	5750 414.000
14.900-15.399	45	26	16	5750 414.500

d1	d2 n6	l1	l2	Order no.
	mm	mm	mm	
15.400-15.899	45	26	16	5750 415.000
15.900-16.399	45	26	16	5750 415.500
16,400-16,899	45	26	16	5750 416.000
16.900-17.399	45	26	16	5750 416.500
17.400-17.899	45	26	16	5750 417.000
17.900-18.399	45	26	16	5750 417.500
18.400-19.509	45	26	16	5750 418.000
19.510-20.509	45	26	16	5750 419.000
20.510-21.509	45	26	16	5750 420.000
21.510-22.609	45	26	16	5750 421.000
22.610-23.609	45	26	16	5750 422.000
23.610-24.609	45	26	16	5750 423.000
24.610-25.609	45	26	16	5750 424.000
25.610-26.609	45	26	16	5750 425.000
26.610-27.609	45	26	16	5750 426.000
27.610-28.609	45	26	16	5750 427.000
28.610-29.609	45	26	16	5750 428.000
29.610-30.609	45	26	16	5750 429.000
30.610-32.609	45	26	16	5750 430.000
32.610-34.699	45	26	16	5750 432.000
34.700-36.699	45	26	16	5750 434.000
34.700-36.699	55	26	14	5750 534.000
36.700-38.699	55	26	14	5750 536.000
38,700-42,699	55	26	14	5750 538.000
42,700-45,699	55	26	14	5750 542.000
45,700-48,999	55	26	14	5750 545.000

Moulded steady rest bushings for single-fluted gun drills

WN

with metal chip protection • special dimensions on request • d1 = gun drill nominal diameter





Article no. **5767**

d1	d2 n6	l1	l2	Order no.
	mm	mm	mm	
2.000-2.099	20	20	12	5767 201.900
2,100-2,199	20	20	12	5767 202.000
2.200-2.299	20	20	12	5767 202.100
2.300-2.399	20	20	12	5767 202.200
2,400-2,499	20	20	12	5767 202.300
2,500-2,599	20	20	12	5767 202.400
2,600-2,699	20	20	12	5767 202.500
2.700-2.799	20	20	12	5767 202.600
2.800-2.899	20	20	12	5767 202.700
2.900-3.099	20	20	12	5767 202.800
3.100-3.359	20	20	12	5767 203.000
3,360-3,459	20	20	12	5767 203.200
3.460-3.559	20	20	12	5767 203.300
3.560-3.799	20	20	12	5767 203.400
3.800-3.959	20	20	12	5767 203.600
3.960-4.259	20	20	12	5767 203.700
4.260-4.499	20	20	12	5767 204.000
4.500-4.749	20	20	12	5767 204.200
4.750-4.999	20	20	12	5767 204.500
5.000-5.249	20	20	12	5767 204.700
5.250-5.499	20	20	12	5767 205.000
5.500-5.749	20	20	12	5767 205.200
5.750-5.999	20	20	12	5767 205.500
6.000-6.249	20	20	12	5767 205.700
6.250-6.449	20	20	12	5767 206.000
6.450-6.749	20	20	12	5767 206.200
6.750-6.999	20	20	12	5767 206.500
7.000-7.299	20	20	12	5767 206.700
7.300-7.599	20	20	12	5767 207.000
7.600-7.799	20	20	12	5767 207.300
7.800-7.999	20	20	12	5767 207.500
8.000-8.299	20	20	12	5767 207.700
8.300-8.699	20	20	12	5767 208.000
8.700-8.999	20	20	12	5767 208.400
9.000-9.299	20	20	12	5767 208.700
9.300-9.699	20	20	12	5767 209.000
9.700-9.999	20	20	12	5767 209.400
10.000-10.299	20	20	12	5767 209.700
10.300-10.799	20	20	12	5767 210.000
10.800-11.299	20	20	12	5767 210.500
11.300-11.799	20	20	12	5767 211.000
11.800-12.399	20	20	12	5767 211.500
3.100-3.359	30	26	14	5767 303.000
3,360-3,459	30	26	14	5767 303.200
3.460-3.559	30	26	14	5767 303.300
3.560-3.799	30	26	14	5767 303.400
3.800-3.959	30	26	14	5767 303.600
3.960-4.259	30	26	14	5767 303.700

d1	d2 n6	l1	l2	Order no.
	mm	mm	mm	
4.260-4.499	30	26	14	5767 304.000
4.500-4.749	30	26	14	5767 304.200
4.750-4.999	30	26	14	5767 304.500
5.000-5.249	30	26	14	5767 304.700
5.250-5.499	30	26	14	5767 305.000
5.500-5.749	30	26	14	5767 305.200
5.750-5.999	30	26	14	5767 305.500
6.000-6.249	30	26	14	5767 305.700
6.250-6.449	30	26	14	5767 306.000
6.450-6.749	30	26	14	5767 306.200
6.750-6.999	30	26	14	5767 306.500
7.000-7.299	30	26	14	5767 306.700
7.300-7.599	30	26	14	5767 307.000
7.600-7.799	30	26	14	5767 307.300
7.800-7.999	30	26	14	5767 307.500
8.000-8.299	30	26	14	5767 307.700
8.300-8.699	30	26	14	5767 308.000
8.700-8.999	30	26	14	5767 308.400
9.000-9.299	30	26	14	5767 308.700
9.300-9.699	30	26	14	5767 309.000
9.700-9.999	30	26	14	5767 309.400
10.000-10.299	30	26	14	5767 309.700
10.300-10.799	30	26	14	5767 310.000
10.800-11.299	30	26	14	5767 310.500
11.300-11.799	30	26	14	5767 311.000
11.800-12.399	30	26	14	5767 311.500
12.400-12.899	30	26	14	5767 312.000
12.900-13.399	30	26	14	5767 312.500
13,400-13,899	30	26	14	5767 313.000
13.900-14.399	30	26	14	5767 313.500
14.400-14.899	30	26	14	5767 314.000
14.900-15.399	30	26	14	5767 314.500
15.400-15.899	30	26	14	5767 315.000
15.900-16.399	30	26	14	5767 315.500
16,400-16,899	30	26	14	5767 316.000
16.900-17.399	30	26	14	5767 316.500
17.400-17.899	30	26	14	5767 317.000
17.900-18.399	30	26	14	5767 317.500
18.400-19.509	30	26	14	5767 318.000
19.510-20.509	30	26	14	5767 319.000
20.510-21.509	30	26	14	5767 320.000
21.510-22.609	30	26	14	5767 321.000
22.610-23.609	30	26	14	5767 322.000
23.610-24.609	30	26	14	5767 323.000
20.510-21.509	45	26	16	5767 420.000
21.510-22.609	45	26	16	5767 421.000
22.610-23.609	45	26	16	5767 422.000
23.610-24.609	45	26	16	5767 423.000

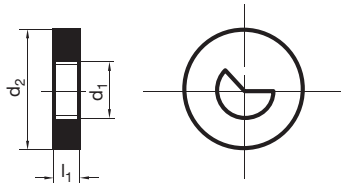
d1	d2 n6	l1	l2	Order no.
	mm	mm	mm	
24.610-25.609	45	26	16	5767 424.000
25.610-26.609	45	26	16	5767 425.000
26.610-27.609	45	26	16	5767 426.000
27.610-28.609	45	26	16	5767 427.000
28.610-29.609	45	26	16	5767 428.000
29.610-30.609	45	26	16	5767 429.000

d1	d2 n6	l1	l2	Order no.
	mm	mm	mm	
30.610-32.609	45	26	16	5767 430.000
32.610-34.699	45	26	16	5767 432.000
34.700-36.699	45	26	16	5767 434.000
36.700-38.699	45	26	16	5767 436.000

Sealing disks for single-fluted gun drills

WN

special dimensions on request • d1 = gun drill nominal diameter





Article no. **5752**

d1	d2 n6	l1	Order no.	d1	d2 n6	l1	Order no.
	mm	mm			mm	mm	
1,850-1,999	20	3	5752 101.800	13.900-14.399	32	4	5752 313.500
2.000-2.099	20	3	5752 101.900	14.400-14.899	32	4	5752 314.000
2,100-2,199	20	3	5752 102.000	14.900-15.399	32	4	5752 314.500
2.200-2.299	20	3	5752 102.100	15.400-15.899	32	4	5752 315.000
2.300-2.399	20	3	5752 102.200	15.900-16.399	32	4	5752 315.500
2,400-2,499	20	3	5752 102.300	16,400-16,899	32	4	5752 316.000
2,500-2,599	20	3	5752 102.400	16.900-17.399	32	4	5752 316.500
2,600-2,699	20	3	5752 102.500	17.400-17.899	32	4	5752 317.000
2.700-2.799	20	3	5752 102.600	17.900-18.399	32	4	5752 317.500
2.800-2.899	20	3	5752 102.700	18.400-19.509	32	4	5752 318.000
2.900-3.099	20	3	5752 102.800	19.510-20.509	32	4	5752 319.000
3.100-3.359	20	3	5752 103.000	5.500-5.749	40	4	5752 405.200
3,360-3,459	20	3	5752 103.200	5.750-5.999	40	4	5752 405.500
3.460-3.559	20	3	5752 103.300	6.000-6.249	40	4	5752 405.700
3.560-3.799	20	3	5752 103.400	6,250-6,499	40	4	5752 406.000
3.800-3.959	20	3	5752 103.600	6.450-6.749	40	4	5752 406.200
3.960-4.259	20	3	5752 103.700	6.750-6.999	40	4	5752 406.500
4.260-4.499	20	3	5752 104.000	7.000-7.299	40	4	5752 406.700
4.500-4.749	20	3	5752 104.200	7.300-7.599	40	4	5752 407.000
4.750-4.999	20	3	5752 104.500	7.600-7.799	40	4	5752 407.300
5.000-5.249	20	3	5752 104.700	7.800-7.999	40	4	5752 407.500
5.250-5.499	20	3	5752 105.000	8.000-8.299	40	4	5752 407.700
5.000-5.249	32	3	5752 204.700	8.300-8.699	40	4	5752 408.000
5.250-5.499	32	3	5752 205.000	8.700-8.999	40	4	5752 408.400
5.500-5.749	32	4	5752 305.200	9.000-9.299	40	4	5752 408.700
5.750-5.999	32	4	5752 305.500	9.300-9.699	40	4	5752 409.000
6.000-6.249	32	4	5752 305.700	9.700-9.999	40	4	5752 409.400
6.250-6.449	32	4	5752 306.000	10.000-10.299	40	4	5752 409.700
6.450-6.749	32	4	5752 306.200	10.300-10.799	40	4	5752 410.000
6.750-6.999	32	4	5752 306.500	10.800-11.299	40	4	5752 410.500
7.000-7.299	32	4	5752 306.700	11.300-11.799	40	4	5752 411.000
7.300-7.599	32	4	5752 307.000	11.800-12.399	40	4	5752 411.500
7.600-7.799	32	4	5752 307.300	12.400-12.899	40	4	5752 412.000
7.800-7.999	32	4	5752 307.500	12.900-13.399	40	4	5752 412.500
8.000-8.299	32	4	5752 307.700	13,400-13,899	40	4	5752 413.000
8.300-8.699	32	4	5752 308.000	13.900-14.399	40	4	5752 413.500
8.700-8.999	32	4	5752 308.400	14.400-14.899	40	4	5752 414.000
9.000-9.299	32	4	5752 308.700	14.900-15.399	40	4	5752 414.500
9.300-9.699	32	4	5752 309.000	15.400-15.899	40	4	5752 415.000
9.700-9.999	32	4	5752 309.400	15.900-16.399	40	4	5752 415.500
10.000-10.299	32	4	5752 309.700	16,400-16,899	40	4	5752 416.000
10.300-10.799	32	4	5752 310.000	16.900-17.399	40	4	5752 416.500
10.800-11.299	32	4	5752 310.500	17.400-17.899	40	4	5752 417.000
11.300-11.799	32	4	5752 311.000	17.900-18.399	40	4	5752 417.500
11.800-12.399	32	4	5752 311.500	18.400-19.509	40	4	5752 418.000
12.400-12.899	32	4	5752 312.000	19.510-20.509	40	4	5752 419.000
12.900-13.399	32	4	5752 312.500	20.510-21.509	40	4	5752 420.000
13,400-13,899	32	4	5752 313.000	21.510-22.609	40	4	5752 421.000

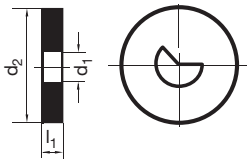
d1	d2 n6	l1	Order no.
	mm	mm	
22.610-23.609	40	4	5752 422.000
23.610-24.609	40	4	5752 423.000
23.610-24.609	90	4	5752 923.000
24.610-25.609	90	4	5752 924.000
25.610-26.609	90	4	5752 925.000
26.610-27.609	90	4	5752 926.000
27.610-28.609	90	4	5752 927.000
28.610-29.609	90	4	5752 928.000
29.610-30.609	90	4	5752 929.000
30.610-32.609	90	4	5752 930.000
32.610-34.699	90	4	5752 932.000
34.700-36.699	90	4	5752 934.000

d1	d2 n6	l1	Order no.
	mm	mm	
36.700-38.699	90	4	5752 936.000
38,700-42,699	90	4	5752 938.000
42,700-45,699	90	4	5752 942.000
45,700-48,999	90	4	5752 945.000

Sealing disks for single-fluted gun drills

WN

with metal chip protection • special dimensions on request • d1 = gun drill nominal diameter





Article no. **5770**

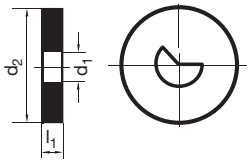
d1	d2 n6	l1	Order no.
	mm	mm	
4,000-4,259	26	4	5770 203.700
4.260-4.499	26	4	5770 204.000
4.500-4.749	26	4	5770 204.200
4.750-4.999	26	4	5770 204.500
5.000-5.249	26	4	5770 204.700
5.250-5.499	26	4	5770 205.000
5.500-5.749	26	4	5770 205.200
5.750-5.999	26	4	5770 205.500
6.000-6.249	26	4	5770 205.700
6.250-6.449	26	4	5770 206.000
6.450-6.749	26	4	5770 206.200
6.750-6.999	26	4	5770 206.500
7.000-7.299	26	4	5770 206.700
7.300-7.599	26	4	5770 207.000
7.600-7.799	26	4	5770 207.300
7.800-7.999	26	4	5770 207.500
8.000-8.299	26	4	5770 207.700
6.000-6.249	46	4	5770 405.700
6.450-6.749	46	4	5770 406.200
7.000-7.299	46	4	5770 406.700
8.000-8.299	46	4	5770 407.700
9.000-9.299	46	4	5770 408.700
9.300-9.699	46	4	5770 409.000
9.700-9.999	46	4	5770 409.400
10.000-10.299	46	4	5770 409.700
10.300-10.799	46	4	5770 410.000
10.800-11.299	46	4	5770 410.500
11.300-11.799	46	4	5770 411.000
11.800-12.399	46	4	5770 411.500
12.400-12.899	46	4	5770 412.000
12.900-13.399	46	4	5770 412.500
13,400-13,899	46	4	5770 413.000
13.900-14.399	46	4	5770 413.500
14.400-14.899	46	4	5770 414.000
14.900-15.399	46	4	5770 414.500
15.400-15.899	46	4	5770 415.000
15.900-16.399	46	4	5770 415.500
16,400-16,899	46	4	5770 416.000
16.900-17.399	46	4	5770 416.500
17.400-17.899	46	4	5770 417.000
17.900-18.399	46	4	5770 417.500
18.400-19.509	46	4	5770 418.000
19.510-20.509	46	4	5770 419.000
20.510-21.509	46	4	5770 420.000
21.510-22.609	46	4	5770 421.000
12.400-12.899	56	4	5770 512.000
20.510-21.509	56	4	5770 520.000
21.510-22.609	56	4	5770 521.000

d1	d2 n6	l1	Order no.
	mm	mm	
22.610-23.609	56	4	5770 522.000
23.610-24.609	56	4	5770 523.000
24.610-25.609	56	4	5770 524.000
25.610-26.609	56	4	5770 525.000
26.610-27.609	56	4	5770 526.000
27.610-28.609	56	4	5770 527.000
28.610-29.609	56	4	5770 528.000
29.610-30.609	56	4	5770 529.000
30.610-32.609	56	4	5770 530.000
32.610-34.699	56	4	5770 532.000
34.700-36.699	56	4	5770 534.000
6.000-6.249	65	4	5770 605.700
8.000-8.299	65	4	5770 607.700
9.000-9.299	65	4	5770 608.700
10.000-10.299	65	4	5770 609.700
10.800-11.299	65	4	5770 610.500
12.400-12.899	65	4	5770 612.000
12.900-13.399	65	4	5770 612.500
13.900-14.399	65	4	5770 613.500
14.400-14.899	65	4	5770 614.000
14.900-15.399	65	4	5770 614.500
15.900-16.399	65	4	5770 615.500
16,400-16,899	65	4	5770 616.000
16.900-17.399	65	4	5770 616.500
17.900-18.399	65	4	5770 617.500
20.510-21.509	65	4	5770 620.000
21.510-22.609	65	4	5770 621.000
7.000-7.299	76	4	5770 706.700
21.510-22.609	76	4	5770 721.000
22.610-23.609	76	4	5770 722.000
25.610-26.609	76	4	5770 725.000
26.610-27.609	76	4	5770 726.000
27.610-28.609	76	4	5770 727.000
28.610-29.609	76	4	5770 728.000
29.610-30.609	76	4	5770 729.000
34.700-36.699	76	4	5770 734.000
36.700-38.699	76	4	5770 736.000
38,700-42,699	76	4	5770 738.000

Sealing disks for single-fluted gun drills

WN

with metal chip protection on both sides • special dimensions on request • d1 = gun drill nominal diameter





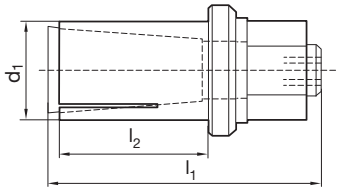
Article no. **5772**

d1	d2 n6	l1	Order no.	d1	d2 n6	l1	Order no.
	mm	mm			mm	mm	
2,900-3,599	20	7	5772 2.800	16,400-17,999	40	12	5772 16.500
3,600-4,399	20	7	5772 3.600	18,000-19,799	40	12	5772 18.000
4,400-5,249	20	7	5772 4.500	19,800-21,799	40	12	5772 20.000
5,250-5,999	32	11	5772 5.200	21,800-23,799	40	12	5772 22.000
6,000-6,799	32	11	5772 6.000	23,800-25,999	40	12	5772 24.000
6,800-7,699	32	11	5772 6.700	26,000-27,999	90	12	5772 26.000
7,700-8,699	32	11	5772 7.700	28,000-29,999	90	12	5772 28.000
8,700-9,999	32	11	5772 8.700	30,000-31,999	90	12	5772 30.000
10,000-11,399	32	11	5772 10.000	32,000-34,999	90	12	5772 32.000
11,400-12,949	32	11	5772 11.500	35,000-36,999	90	12	5772 36.000
12,950-14,449	32	11	5772 13.000	37,000-38,999	90	12	5772 38.000
14,450-16,399	32	11	5772 14.500	39,000-40,999	90	12	5772 42.000

Sealing plugs

WN

sealing plugs for sealing coolant bores • special dimensions on request





Article no. **5766**

d1	l1	l2	Order no.	d1	l1	l2	Order no.
mm	mm	mm		mm	mm	mm	
8.000	28.00	15.00	5766 108.000	8.000	71.00	58.00	5766 208.000
9.000	30.00	15.00	5766 109.000	9.000	76.00	63.00	5766 209.000
10.000	30.00	15.00	5766 110.000	10.000	89.00	73.00	5766 210.000
11.000	34.00	18.00	5766 111.000	11.000	89.00	73.00	5766 211.000
12.000	34.00	18.00	5766 112.000	12.000	99.00	83.00	5766 212.000
13.000	37.00	20.00	5766 113.000	13.000	110.00	93.00	5766 213.000
14.000	37.00	20.00	5766 114.000	14.000	110.00	93.00	5766 214.000
15.000	37.00	20.00	5766 115.000	15.000	115.00	98.00	5766 215.000
16.000	37.00	20.00	5766 116.000	16.000	115.00	98.00	5766 216.000
17.000	37.00	20.00	5766 117.000	17.000	115.00	98.00	5766 217.000
18.000	37.00	20.00	5766 118.000	18.000	120.00	98.00	5766 218.000
19.000	44.00	20.00	5766 119.000	19.000	120.00	98.00	5766 219.000
20.000	44.00	20.00	5766 120.000	20.000	120.00	98.00	5766 220.000
21.000	44.00	20.00	5766 121.000	21.000	120.00	98.00	5766 221.000
22.000	44.00	20.00	5766 122.000	22.000	120.00	98.00	5766 222.000
23.000	44.00	20.00	5766 123.000	23.000	120.00	98.00	5766 223.000
24.000	44.00	20.00	5766 124.000	24.000	120.00	98.00	5766 224.000
25.000	44.00	20.00	5766 125.000	25.000	120.00	98.00	5766 225.000

Torque wrenches set

WN

with torque wrench
incl. torque setting tool, bit holder and bits



Article no. **4966**

Drive	Bit sizes	Torque	**Order no.**
		Nm	
1/4	T5/T7/T8	0,4-1	4966 1.000
1/4	T8/T9/T15/T20	1-5	4966 2.000

Torque wrenches

WN

incl. torque setting tool and bit holder

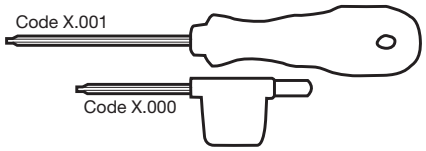


Article no. **4915**

Key size	Torx	Torque	Type	**Order no.**
		Nm		
hexagonal	1/4	0,4-1	A	4915 1.001
hexagonal	1/4	0,8-5	A	4915 5.001

Torx screwdrivers

WN



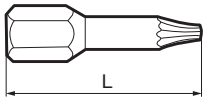


	Article no.	1612

Size	Order no.
T5	1612 5.001
T7	1612 7.001
T8	1612 8.001
T9	1612 9.001
T15	1612 15.001
T20	1612 20.001

Torx socket sets

WN



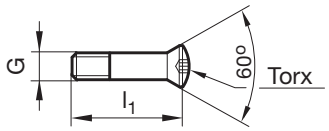


Article no. **4917**

Key size	Drive	Torx	L	Order no.	Key size	Drive	Torx	L	Order no.
			mm					mm	
hexagonal	1/4	T5	25	4917 5.000					
hexagonal	1/4	T7	25	4917 7.000					
hexagonal	1/4	T8	25	4917 8.000					
hexagonal	1/4	T9	25	4917 9.000					
hexagonal	1/4	T15	25	4917 15.000					
hexagonal	1/4	T20	25	4917 20.000					

Clamping screws

WN





Article no. **4071**

G	l1	Torx	Order no.	G	l1	Torx	Order no.
	mm				mm		
M1,6	4.40	T5 Plus	4071 1.601	M3	8.00	T9 Plus	4071 3.003
M2,2	5.60	T7 Plus	4071 2.202	M4	7.70	T15 Plus	4071 4.001
M2,2	4.60	T7 Plus	4071 2.203	M4	10.60	T15 Plus	4071 4.002
M2,5	6.40	T8 Plus	4071 2.501	M4,5	11.80	T15 Plus	4071 4.501
M2,5	5.20	T8 Plus	4071 2.502	M5	14.20	T20 Plus	4071 5.002
M3	6.40	T9 Plus	4071 3.002				

Stub drills

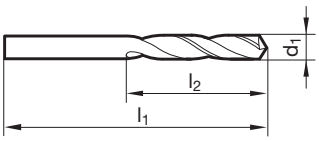
~3xD | GT 500 DZ | DIN 1897 | 130° | h8

Tool material	HSS-E-PM
Surface	F
Shank form	cyl.

P	•	web thinning ≥ Ø 1.000 • relieved cone point geometry with special type B web thinning • PM-Co-alloyed high speed steel • especially high rigidity • especially high wear resistance
M	○	
K	•	high-tensile materials, high-alloyed steels • heat treatable and case hardened steels • cast iron, brass, bronze
N	○	
S	•	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 314





Article no. 515

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
1.000		26.00	6.00	515 1.000
1.020		26.00	6.00	515 1.020
1.040		26.00	6.00	515 1.040
1.070		28.00	7.00	515 1.070
1.090		28.00	7.00	515 1.090
1.100		28.00	7.00	515 1.100
1.180		28.00	7.00	515 1.180
1.190	3/64	30.00	8.00	515 1.190
1.200		30.00	8.00	515 1.200
1.300		30.00	8.00	515 1.300
1.320		30.00	8.00	515 1.320
1.400		32.00	9.00	515 1.400
1.500		32.00	9.00	515 1.500
1.510		34.00	10.00	515 1.510
1.590	1/16	34.00	10.00	515 1.590
1.600		34.00	10.00	515 1.600
1.610		34.00	10.00	515 1.610
1.700		34.00	10.00	515 1.700
1.780		36.00	11.00	515 1.780
1.800		36.00	11.00	515 1.800
1.850		36.00	11.00	515 1.850
1.900		36.00	11.00	515 1.900
1.930		38.00	12.00	515 1.930
1.980	5/64	38.00	12.00	515 1.980
1.990		38.00	12.00	515 1.990
2.000		38.00	12.00	515 2.000
2.060		38.00	12.00	515 2.060
2.080		38.00	12.00	515 2.080
2.100		38.00	12.00	515 2.100
2.180		40.00	13.00	515 2.180
2.200		40.00	13.00	515 2.200
2.260		40.00	13.00	515 2.260
2.300		40.00	13.00	515 2.300
2.370		43.00	14.00	515 2.370
2.380	3/32	43.00	14.00	515 2.380
2.400		43.00	14.00	515 2.400
2.440		43.00	14.00	515 2.440
2.490		43.00	14.00	515 2.490
2.500		43.00	14.00	515 2.500
2.530		43.00	14.00	515 2.530
2.580		43.00	14.00	515 2.580
2.600		43.00	14.00	515 2.600

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
2.640		43.00	14.00	515 2.640
2.700		46.00	16.00	515 2.700
2.710		46.00	16.00	515 2.710
2.780	7/64	46.00	16.00	515 2.780
2.790		46.00	16.00	515 2.790
2.800		46.00	16.00	515 2.800
2.820		46.00	16.00	515 2.820
2.870		46.00	16.00	515 2.870
2.900		46.00	16.00	515 2.900
2.950		46.00	16.00	515 2.950
3.000		46.00	16.00	515 3.000
3.050		49.00	18.00	515 3.050
3.100		49.00	18.00	515 3.100
3.170	1/8	49.00	18.00	515 3.170
3.200		49.00	18.00	515 3.200
3.260		49.00	18.00	515 3.260
3.300		49.00	18.00	515 3.300
3.400		52.00	20.00	515 3.400
3.450		52.00	20.00	515 3.450
3.500		52.00	20.00	515 3.500
3.570	9/64	52.00	20.00	515 3.570
3.600		52.00	20.00	515 3.600
3.660		52.00	20.00	515 3.660
3.700		52.00	20.00	515 3.700
3.730		52.00	20.00	515 3.730
3.800		55.00	22.00	515 3.800
3.860		55.00	22.00	515 3.860
3.900		55.00	22.00	515 3.900
3.910		55.00	22.00	515 3.910
3.970	5/32	55.00	22.00	515 3.970
3.990		55.00	22.00	515 3.990
4.000		55.00	22.00	515 4.000
4.040		55.00	22.00	515 4.040
4.090		55.00	22.00	515 4.090
4.100		55.00	22.00	515 4.100
4.200		55.00	22.00	515 4.200
4.220		55.00	22.00	515 4.220
4.300		58.00	24.00	515 4.300
4.370	11/64	58.00	24.00	515 4.370
4.390		58.00	24.00	515 4.390
4.400		58.00	24.00	515 4.400
4.500		58.00	24.00	515 4.500

d1		l1	l2	Order no.
mm	inch	mm	mm	
4.570		58.00	24.00	515 4.570
4.600		58.00	24.00	515 4.600
4.620		58.00	24.00	515 4.620
4.650		58.00	24.00	515 4.650
4.700		58.00	24.00	515 4.700
4.760	3/16	62.00	26.00	515 4.760
4.800		62.00	26.00	515 4.800
4.850		62.00	26.00	515 4.850
4.900		62.00	26.00	515 4.900
4.920		62.00	26.00	515 4.920
4.980		62.00	26.00	515 4.980
5.000		62.00	26.00	515 5.000
5.060		62.00	26.00	515 5.060
5.100		62.00	26.00	515 5.100
5.110		62.00	26.00	515 5.110
5.160	13/64	62.00	26.00	515 5.160
5.180		62.00	26.00	515 5.180
5.200		62.00	26.00	515 5.200
5.220		62.00	26.00	515 5.220
5.300		62.00	26.00	515 5.300
5.310		66.00	28.00	515 5.310
5.400		66.00	28.00	515 5.400
5.410		66.00	28.00	515 5.410
5.500		66.00	28.00	515 5.500
5.560	7/32	66.00	28.00	515 5.560
5.600		66.00	28.00	515 5.600
5.610		66.00	28.00	515 5.610
5.700		66.00	28.00	515 5.700
5.790		66.00	28.00	515 5.790
5.800		66.00	28.00	515 5.800
5.900		66.00	28.00	515 5.900
5.940		66.00	28.00	515 5.940
5.950	15/64	66.00	28.00	515 5.950
6.000		66.00	28.00	515 6.000
6.040		70.00	31.00	515 6.040
6.100		70.00	31.00	515 6.100
6.150		70.00	31.00	515 6.150
6.200		70.00	31.00	515 6.200
6.250		70.00	31.00	515 6.250
6.300		70.00	31.00	515 6.300
6.350	1/4	70.00	31.00	515 6.350
6.400		70.00	31.00	515 6.400
6.500		70.00	31.00	515 6.500
6.530		70.00	31.00	515 6.530
6.600		70.00	31.00	515 6.600
6.630		70.00	31.00	515 6.630
6.700		70.00	31.00	515 6.700
6.750	17/64	74.00	34.00	515 6.750
6.800		74.00	34.00	515 6.800
6.900		74.00	34.00	515 6.900
7.000		74.00	34.00	515 7.000
7.030		74.00	34.00	515 7.030
7.100		74.00	34.00	515 7.100
7.140	9/32	74.00	34.00	515 7.140
7.200		74.00	34.00	515 7.200
7.300		74.00	34.00	515 7.300
7.370		74.00	34.00	515 7.370
7.400		74.00	34.00	515 7.400
7.490		74.00	34.00	515 7.490
7.500		74.00	34.00	515 7.500
7.540	19/64	79.00	37.00	515 7.540
7.600		79.00	37.00	515 7.600
7.670		79.00	37.00	515 7.670
7.700		79.00	37.00	515 7.700
7.800		79.00	37.00	515 7.800
7.900		79.00	37.00	515 7.900

d1		l1	l2	Order no.
mm	inch	mm	mm	
7.940	5/16	79.00	37.00	515 7.940
8.000		79.00	37.00	515 8.000
8.030		79.00	37.00	515 8.030
8.100		79.00	37.00	515 8.100
8.200		79.00	37.00	515 8.200
8.300		79.00	37.00	515 8.300
8.330	21/64	79.00	37.00	515 8.330
8.400		79.00	37.00	515 8.400
8.430		79.00	37.00	515 8.430
8.500		79.00	37.00	515 8.500
8.600		84.00	40.00	515 8.600
8.610		84.00	40.00	515 8.610
8.700		84.00	40.00	515 8.700
8.730	11/32	84.00	40.00	515 8.730
8.800		84.00	40.00	515 8.800
8.840		84.00	40.00	515 8.840
8.900		84.00	40.00	515 8.900
9.000		84.00	40.00	515 9.000
9.090		84.00	40.00	515 9.090
9.100		84.00	40.00	515 9.100
9.130	23/64	84.00	40.00	515 9.130
9.200		84.00	40.00	515 9.200
9.300		84.00	40.00	515 9.300
9.340		84.00	40.00	515 9.340
9.350		84.00	40.00	515 9.350
9.400		84.00	40.00	515 9.400
9.500		84.00	40.00	515 9.500
9.520	3/8	89.00	43.00	515 9.520
9.580		89.00	43.00	515 9.580
9.600		89.00	43.00	515 9.600
9.700		89.00	43.00	515 9.700
9.800		89.00	43.00	515 9.800
9.900		89.00	43.00	515 9.900
9.920	25/64	89.00	43.00	515 9.920
10.000		89.00	43.00	515 10.000
10.080		89.00	43.00	515 10.080
10.200		89.00	43.00	515 10.200
10.260		89.00	43.00	515 10.260
10.320	13/32	89.00	43.00	515 10.320
10.490		89.00	43.00	515 10.490
10.500		89.00	43.00	515 10.500
10.720	27/64	95.00	47.00	515 10.720
11.000		95.00	47.00	515 11.000
11.110	7/16	95.00	47.00	515 11.110
11.500		95.00	47.00	515 11.500
11.510	29/64	95.00	47.00	515 11.510
11.800		95.00	47.00	515 11.800
11.910	15/32	102.00	51.00	515 11.910
12.000		102.00	51.00	515 12.000
12.300	31/64	102.00	51.00	515 12.300
12.500		102.00	51.00	515 12.500
12.700	1/2	102.00	51.00	515 12.700
13.000		102.00	51.00	515 13.000
13.100	33/64	102.00	51.00	515 13.100
13.490	17/32	107.00	54.00	515 13.490
13.500		107.00	54.00	515 13.500
14.000		107.00	54.00	515 14.000
14.290	9/16	111.00	56.00	515 14.290

Jobber drills

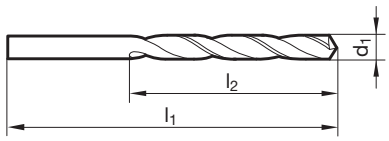
~5xD | GT 100 | DIN 338 | 130° | h8

Tool material	HSCO
Surface	>Ø 2,36
Shank form	cyl.

P	•	web thinning ≥ Ø 1.000 • relieved cone • Co-alloyed high speed steel • wide flutes • increased wear resistance • especially for drilling depths > 3xD
M	○	
K	•	
N	•	alloyed/unalloyed steel • cast materials over 800 N/mm² • hot and cold rolled steels • antifriction bearing steels • high-alloyed steels • heat treatable and case hardened steels
S		
H		

GÜHRING NAVIGATOR

Cutting data page 314





Article no. **622**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
1.000		34.00	12.00	622 1.000
1.020		34.00	12.00	622 1.020
1.040		34.00	12.00	622 1.040
1.050		34.00	12.00	622 1.050
1.070		36.00	14.00	622 1.070
1.090		36.00	14.00	622 1.090
1.100		36.00	14.00	622 1.100
1.130		36.00	14.00	622 1.130
1.150		36.00	14.00	622 1.150
1.180		36.00	14.00	622 1.180
1.190	3/64	38.00	16.00	622 1.190
1.200		38.00	16.00	622 1.200
1.250		38.00	16.00	622 1.250
1.270		38.00	16.00	622 1.270
1.300		38.00	16.00	622 1.300
1.320		38.00	16.00	622 1.320
1.350		40.00	18.00	622 1.350
1.400		40.00	18.00	622 1.400
1.430		40.00	18.00	622 1.430
1.440		40.00	18.00	622 1.440
1.450		40.00	18.00	622 1.450
1.500		40.00	18.00	622 1.500
1.510		43.00	20.00	622 1.510
1.550		43.00	20.00	622 1.550
1.590	1/16	43.00	20.00	622 1.590
1.600		43.00	20.00	622 1.600
1.610		43.00	20.00	622 1.610
1.650		43.00	20.00	622 1.650
1.700		43.00	20.00	622 1.700
1.780		46.00	22.00	622 1.780
1.800		46.00	22.00	622 1.800
1.850		46.00	22.00	622 1.850
1.900		46.00	22.00	622 1.900
1.920		49.00	24.00	622 1.920
1.930		49.00	24.00	622 1.930
1.950		49.00	24.00	622 1.950
1.960		49.00	24.00	622 1.960
1.980	5/64	49.00	24.00	622 1.980
1.990		49.00	24.00	622 1.990
2.000		49.00	24.00	622 2.000
2.050		49.00	24.00	622 2.050
2.060		49.00	24.00	622 2.060

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
2.080		49.00	24.00	622 2.080
2.100		49.00	24.00	622 2.100
2.150		53.00	27.00	622 2.150
2.180		53.00	27.00	622 2.180
2.200		53.00	27.00	622 2.200
2.250		53.00	27.00	622 2.250
2.260		53.00	27.00	622 2.260
2.300		53.00	27.00	622 2.300
2.350		53.00	27.00	622 2.350
2.370		57.00	30.00	622 2.370
2.380	3/32	57.00	30.00	622 2.380
2.400		57.00	30.00	622 2.400
2.420		57.00	30.00	622 2.420
2.440		57.00	30.00	622 2.440
2.450		57.00	30.00	622 2.450
2.490		57.00	30.00	622 2.490
2.500		57.00	30.00	622 2.500
2.530		57.00	30.00	622 2.530
2.550		57.00	30.00	622 2.550
2.580		57.00	30.00	622 2.580
2.600		57.00	30.00	622 2.600
2.640		57.00	30.00	622 2.640
2.650		57.00	30.00	622 2.650
2.700		61.00	33.00	622 2.700
2.710		61.00	33.00	622 2.710
2.750		61.00	33.00	622 2.750
2.780	7/64	61.00	33.00	622 2.780
2.790		61.00	33.00	622 2.790
2.800		61.00	33.00	622 2.800
2.820		61.00	33.00	622 2.820
2.850		61.00	33.00	622 2.850
2.870		61.00	33.00	622 2.870
2.900		61.00	33.00	622 2.900
2.950		61.00	33.00	622 2.950
3.000		61.00	33.00	622 3.000
3.050		65.00	36.00	622 3.050
3.100		65.00	36.00	622 3.100
3.150		65.00	36.00	622 3.150
3.170	1/8	65.00	36.00	622 3.170
3.200		65.00	36.00	622 3.200
3.250		65.00	36.00	622 3.250
3.260		65.00	36.00	622 3.260

d1		l1	l2	Order no.
mm	inch	mm	mm	
3.300		65.00	36.00	622 3.300
3.400		70.00	39.00	622 3.400
3.450		70.00	39.00	622 3.450
3.500		70.00	39.00	622 3.500
3.570	9/64	70.00	39.00	622 3.570
3.600		70.00	39.00	622 3.600
3.650		70.00	39.00	622 3.650
3.660		70.00	39.00	622 3.660
3.700		70.00	39.00	622 3.700
3.730		70.00	39.00	622 3.730
3.800		75.00	43.00	622 3.800
3.860		75.00	43.00	622 3.860
3.900		75.00	43.00	622 3.900
3.910		75.00	43.00	622 3.910
3.970	5/32	75.00	43.00	622 3.970
3.990		75.00	43.00	622 3.990
4.000		75.00	43.00	622 4.000
4.020		75.00	43.00	622 4.020
4.040		75.00	43.00	622 4.040
4.050		75.00	43.00	622 4.050
4.090		75.00	43.00	622 4.090
4.100		75.00	43.00	622 4.100
4.150		75.00	43.00	622 4.150
4.200		75.00	43.00	622 4.200
4.220		75.00	43.00	622 4.220
4.250		75.00	43.00	622 4.250
4.300		80.00	47.00	622 4.300
4.370	11/64	80.00	47.00	622 4.370
4.390		80.00	47.00	622 4.390
4.400		80.00	47.00	622 4.400
4.500		80.00	47.00	622 4.500
4.550		80.00	47.00	622 4.550
4.570		80.00	47.00	622 4.570
4.600		80.00	47.00	622 4.600
4.620		80.00	47.00	622 4.620
4.650		80.00	47.00	622 4.650
4.700		80.00	47.00	622 4.700
4.750		80.00	47.00	622 4.750
4.760	3/16	86.00	52.00	622 4.760
4.800		86.00	52.00	622 4.800
4.850		86.00	52.00	622 4.850
4.900		86.00	52.00	622 4.900
4.920		86.00	52.00	622 4.920
4.980		86.00	52.00	622 4.980
5.000		86.00	52.00	622 5.000
5.060		86.00	52.00	622 5.060
5.100		86.00	52.00	622 5.100
5.110		86.00	52.00	622 5.110
5.160	13/64	86.00	52.00	622 5.160
5.180		86.00	52.00	622 5.180
5.200		86.00	52.00	622 5.200
5.220		86.00	52.00	622 5.220
5.250		86.00	52.00	622 5.250
5.300		86.00	52.00	622 5.300
5.310		93.00	57.00	622 5.310
5.400		93.00	57.00	622 5.400
5.410		93.00	57.00	622 5.410
5.500		93.00	57.00	622 5.500
5.560	7/32	93.00	57.00	622 5.560
5.600		93.00	57.00	622 5.600
5.610		93.00	57.00	622 5.610
5.700		93.00	57.00	622 5.700
5.750		93.00	57.00	622 5.750
5.790		93.00	57.00	622 5.790
5.800		93.00	57.00	622 5.800
5.900		93.00	57.00	622 5.900
5.940		93.00	57.00	622 5.940
5.950	15/64	93.00	57.00	622 5.950
6.000		93.00	57.00	622 6.000
6.040		101.00	63.00	622 6.040
6.050		101.00	63.00	622 6.050
6.100		101.00	63.00	622 6.100

d1		l1	l2	Order no.
mm	inch	mm	mm	
6.150		101.00	63.00	622 6.150
6.200		101.00	63.00	622 6.200
6.250		101.00	63.00	622 6.250
6.300		101.00	63.00	622 6.300
6.350	1/4	101.00	63.00	622 6.350
6.400		101.00	63.00	622 6.400
6.500		101.00	63.00	622 6.500
6.530		101.00	63.00	622 6.530
6.600		101.00	63.00	622 6.600
6.630		101.00	63.00	622 6.630
6.650		101.00	63.00	622 6.650
6.700		101.00	63.00	622 6.700
6.750	17/64	109.00	69.00	622 6.750
6.800		109.00	69.00	622 6.800
6.900		109.00	69.00	622 6.900
7.000		109.00	69.00	622 7.000
7.030		109.00	69.00	622 7.030
7.100		109.00	69.00	622 7.100
7.140	9/32	109.00	69.00	622 7.140
7.200		109.00	69.00	622 7.200
7.300		109.00	69.00	622 7.300
7.370		109.00	69.00	622 7.370
7.400		109.00	69.00	622 7.400
7.450		109.00	69.00	622 7.450
7.490		109.00	69.00	622 7.490
7.500		109.00	69.00	622 7.500
7.540	19/64	117.00	75.00	622 7.540
7.600		117.00	75.00	622 7.600
7.670		117.00	75.00	622 7.670
7.700		117.00	75.00	622 7.700
7.750		117.00	75.00	622 7.750
7.800		117.00	75.00	622 7.800
7.900		117.00	75.00	622 7.900
7.940	5/16	117.00	75.00	622 7.940
8.000		117.00	75.00	622 8.000
8.030		117.00	75.00	622 8.030
8.100		117.00	75.00	622 8.100
8.200		117.00	75.00	622 8.200
8.300		117.00	75.00	622 8.300
8.330	21/64	117.00	75.00	622 8.330
8.400		117.00	75.00	622 8.400
8.430		117.00	75.00	622 8.430
8.500		117.00	75.00	622 8.500
8.600		125.00	81.00	622 8.600
8.610		125.00	81.00	622 8.610
8.700		125.00	81.00	622 8.700
8.730	11/32	125.00	81.00	622 8.730
8.800		125.00	81.00	622 8.800
8.840		125.00	81.00	622 8.840
8.900		125.00	81.00	622 8.900
9.000		125.00	81.00	622 9.000
9.090		125.00	81.00	622 9.090
9.100		125.00	81.00	622 9.100
9.130	23/64	125.00	81.00	622 9.130
9.200		125.00	81.00	622 9.200
9.300		125.00	81.00	622 9.300
9.340		125.00	81.00	622 9.340
9.400		125.00	81.00	622 9.400
9.500		125.00	81.00	622 9.500
9.520	3/8	133.00	87.00	622 9.520
9.580		133.00	87.00	622 9.580
9.600		133.00	87.00	622 9.600
9.700		133.00	87.00	622 9.700
9.800		133.00	87.00	622 9.800
9.900		133.00	87.00	622 9.900
9.920	25/64	133.00	87.00	622 9.920
10.000		133.00	87.00	622 10.000
10.080		133.00	87.00	622 10.080
10.100		133.00	87.00	622 10.100
10.200		133.00	87.00	622 10.200
10.250		133.00	87.00	622 10.250
10.260		133.00	87.00	622 10.260

d1		l1	l2	Order no.
mm	inch	mm	mm	
10.300		133.00	87.00	622 10.300
10.320	13/32	133.00	87.00	622 10.320
10.400		133.00	87.00	622 10.400
10.500		133.00	87.00	622 10.500
10.600		133.00	87.00	622 10.600
10.700		142.00	94.00	622 10.700
10.720	27/64	142.00	94.00	622 10.720
10.800		142.00	94.00	622 10.800
10.900		142.00	94.00	622 10.900
11.000		142.00	94.00	622 11.000
11.100		142.00	94.00	622 11.100
11.110	7/16	142.00	94.00	622 11.110
11.200		142.00	94.00	622 11.200
11.300		142.00	94.00	622 11.300
11.400		142.00	94.00	622 11.400
11.500		142.00	94.00	622 11.500
11.510	29/64	142.00	94.00	622 11.510
11.600		142.00	94.00	622 11.600

d1		l1	l2	Order no.
mm	inch	mm	mm	
11.700		142.00	94.00	622 11.700
11.800		142.00	94.00	622 11.800
11.910	15/32	151.00	101.00	622 11.910
12.000		151.00	101.00	622 12.000
12.500		151.00	101.00	622 12.500
12.700	1/2	151.00	101.00	622 12.700
12.800		151.00	101.00	622 12.800
13.000		151.00	101.00	622 13.000
13.500		160.00	108.00	622 13.500
13.800		160.00	108.00	622 13.800
14.000		160.00	108.00	622 14.000
14.500		169.00	114.00	622 14.500
14.800		169.00	114.00	622 14.800
15.000		169.00	114.00	622 15.000
15.500		178.00	120.00	622 15.500
16.000		178.00	120.00	622 16.000

Jobber drills

~5xD | GT 100 | DIN 338 | 130° | h8

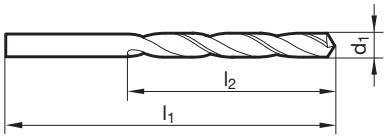
Tool material	HSCO
Surface	F
Shank form	cyl.

P	•	web thinning ≥ Ø 1.000 • relieved cone • Co-alloyed high speed steel • wide flutes • increased wear resistance • especially for drilling depths > 3xD
M	○	
K	•	
N	•	alloyed and unalloyed steel • cast materials over 800 N/mm² • hot and cold rolled steels • antifriction bearing steels • high-alloyed steels • heat treatable and case hardened steels
S		
H	○	

GÜHRINGNAVIGATOR

Cutting data page 314





Article no. **2459**

d1 mm	inch	l1 mm	l2 mm	Order no.
1.000		34.00	12.00	2459 1.000
1.100		36.00	14.00	2459 1.100
1.200		38.00	16.00	2459 1.200
1.300		38.00	16.00	2459 1.300
1.400		40.00	18.00	2459 1.400
1.500		40.00	18.00	2459 1.500
1.600		43.00	20.00	2459 1.600
1.700		43.00	20.00	2459 1.700
1.800		46.00	22.00	2459 1.800
1.900		46.00	22.00	2459 1.900
2.000		49.00	24.00	2459 2.000
2.100		49.00	24.00	2459 2.100
2.200		53.00	27.00	2459 2.200
2.300		53.00	27.00	2459 2.300
2.400		57.00	30.00	2459 2.400
2.500		57.00	30.00	2459 2.500
2.600		57.00	30.00	2459 2.600
2.700		61.00	33.00	2459 2.700
2.800		61.00	33.00	2459 2.800
2.900		61.00	33.00	2459 2.900
3.000		61.00	33.00	2459 3.000
3.100		65.00	36.00	2459 3.100
3.200		65.00	36.00	2459 3.200
3.300		65.00	36.00	2459 3.300
3.400		70.00	39.00	2459 3.400
3.500		70.00	39.00	2459 3.500
3.600		70.00	39.00	2459 3.600
3.700		70.00	39.00	2459 3.700
3.800		75.00	43.00	2459 3.800
3.900		75.00	43.00	2459 3.900
4.000		75.00	43.00	2459 4.000
4.100		75.00	43.00	2459 4.100
4.200		75.00	43.00	2459 4.200
4.300		80.00	47.00	2459 4.300
4.400		80.00	47.00	2459 4.400
4.500		80.00	47.00	2459 4.500
4.600		80.00	47.00	2459 4.600
4.700		80.00	47.00	2459 4.700
4.800		86.00	52.00	2459 4.800
4.900		86.00	52.00	2459 4.900
5.000		86.00	52.00	2459 5.000
5.100		86.00	52.00	2459 5.100

d1 mm	inch	l1 mm	l2 mm	Order no.
5.200		86.00	52.00	2459 5.200
5.300		86.00	52.00	2459 5.300
5.400		93.00	57.00	2459 5.400
5.500		93.00	57.00	2459 5.500
5.600		93.00	57.00	2459 5.600
5.700		93.00	57.00	2459 5.700
5.800		93.00	57.00	2459 5.800
5.900		93.00	57.00	2459 5.900
6.000		93.00	57.00	2459 6.000
6.100		101.00	63.00	2459 6.100
6.200		101.00	63.00	2459 6.200
6.300		101.00	63.00	2459 6.300
6.400		101.00	63.00	2459 6.400
6.500		101.00	63.00	2459 6.500
6.600		101.00	63.00	2459 6.600
6.700		101.00	63.00	2459 6.700
6.800		109.00	69.00	2459 6.800
6.900		109.00	69.00	2459 6.900
7.000		109.00	69.00	2459 7.000
7.100		109.00	69.00	2459 7.100
7.200		109.00	69.00	2459 7.200
7.400		109.00	69.00	2459 7.400
7.500		109.00	69.00	2459 7.500
7.600		117.00	75.00	2459 7.600
7.700		117.00	75.00	2459 7.700
7.800		117.00	75.00	2459 7.800
7.900		117.00	75.00	2459 7.900
8.000		117.00	75.00	2459 8.000
8.100		117.00	75.00	2459 8.100
8.200		117.00	75.00	2459 8.200
8.300		117.00	75.00	2459 8.300
8.400		117.00	75.00	2459 8.400
8.500		117.00	75.00	2459 8.500
8.600		125.00	81.00	2459 8.600
8.700		125.00	81.00	2459 8.700
8.800		125.00	81.00	2459 8.800
8.900		125.00	81.00	2459 8.900
9.000		125.00	81.00	2459 9.000
9.100		125.00	81.00	2459 9.100
9.200		125.00	81.00	2459 9.200
9.300		125.00	81.00	2459 9.300
9.400		125.00	81.00	2459 9.400

d1		l1	l2	Order no.
mm	inch	mm	mm	
9.500		125.00	81.00	2459 9.500
9.700		133.00	87.00	2459 9.700
9.800		133.00	87.00	2459 9.800
9.900		133.00	87.00	2459 9.900
10.000		133.00	87.00	2459 10.000
10.100		133.00	87.00	2459 10.100
10.200		133.00	87.00	2459 10.200
10.300		133.00	87.00	2459 10.300
10.400		133.00	87.00	2459 10.400
10.500		133.00	87.00	2459 10.500
10.700		142.00	94.00	2459 10.700
10.800		142.00	94.00	2459 10.800

d1		l1	l2	Order no.
mm	inch	mm	mm	
11.000		142.00	94.00	2459 11.000
11.500		142.00	94.00	2459 11.500
11.700		142.00	94.00	2459 11.700
12.000		151.00	101.00	2459 12.000
12.500		151.00	101.00	2459 12.500
13.000		151.00	101.00	2459 13.000
13.500		160.00	108.00	2459 13.500
14.000		160.00	108.00	2459 14.000
15.000		169.00	114.00	2459 15.000
16.000		178.00	120.00	2459 16.000

Long series twist drills

~10xD | GT 100 | DIN 340 | 130° | h8

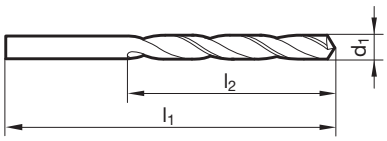
Tool material	HSCO
Surface	>Ø 2,36
Shank form	cyl.

P	•	web thinning ≥ Ø 1.000 • relieved cone • Co-alloyed high speed steel • wide flutes • increased wear resistance • in case of poor chip evacuation
M	•	
K	•	
N	•	alloyed/unalloyed steels and castings over 800 N/mm² • hot and cold rolled steels • antifriction bearing steels • high-alloyed steels • heat treatable and case hardened steels
S		
H	○	

GÜHRINGNAVIGATOR

Cutting data page 316





Article no. **336**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
1.000		56.00	33.00	336 1.000
1.020		56.00	33.00	336 1.020
1.040		56.00	33.00	336 1.040
1.070		60.00	37.00	336 1.070
1.090		60.00	37.00	336 1.090
1.100		60.00	37.00	336 1.100
1.180		60.00	37.00	336 1.180
1.190	3/64	65.00	41.00	336 1.190
1.200		65.00	41.00	336 1.200
1.250		65.00	41.00	336 1.250
1.300		65.00	41.00	336 1.300
1.320		65.00	41.00	336 1.320
1.400		70.00	45.00	336 1.400
1.500		70.00	45.00	336 1.500
1.510		76.00	50.00	336 1.510
1.550		76.00	50.00	336 1.550
1.590	1/16	76.00	50.00	336 1.590
1.600		76.00	50.00	336 1.600
1.610		76.00	50.00	336 1.610
1.700		76.00	50.00	336 1.700
1.750		80.00	53.00	336 1.750
1.780		80.00	53.00	336 1.780
1.800		80.00	53.00	336 1.800
1.850		80.00	53.00	336 1.850
1.900		80.00	53.00	336 1.900
1.930		85.00	56.00	336 1.930
1.980	5/64	85.00	56.00	336 1.980
1.990		85.00	56.00	336 1.990
2.000		85.00	56.00	336 2.000
2.050		85.00	56.00	336 2.050
2.060		85.00	56.00	336 2.060
2.080		85.00	56.00	336 2.080
2.100		85.00	56.00	336 2.100
2.180		90.00	59.00	336 2.180
2.200		90.00	59.00	336 2.200
2.250		90.00	59.00	336 2.250
2.260		90.00	59.00	336 2.260
2.300		90.00	59.00	336 2.300
2.350		90.00	59.00	336 2.350
2.370		95.00	62.00	336 2.370
2.380	3/32	95.00	62.00	336 2.380
2.400		95.00	62.00	336 2.400

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
2.440		95.00	62.00	336 2.440
2.450		95.00	62.00	336 2.450
2.490		95.00	62.00	336 2.490
2.500		95.00	62.00	336 2.500
2.530		95.00	62.00	336 2.530
2.550		95.00	62.00	336 2.550
2.580		95.00	62.00	336 2.580
2.600		95.00	62.00	336 2.600
2.640		95.00	62.00	336 2.640
2.700		100.00	66.00	336 2.700
2.710		100.00	66.00	336 2.710
2.750		100.00	66.00	336 2.750
2.780	7/64	100.00	66.00	336 2.780
2.790		100.00	66.00	336 2.790
2.800		100.00	66.00	336 2.800
2.820		100.00	66.00	336 2.820
2.850		100.00	66.00	336 2.850
2.870		100.00	66.00	336 2.870
2.900		100.00	66.00	336 2.900
2.950		100.00	66.00	336 2.950
3.000		100.00	66.00	336 3.000
3.050		106.00	69.00	336 3.050
3.100		106.00	69.00	336 3.100
3.170	1/8	106.00	69.00	336 3.170
3.200		106.00	69.00	336 3.200
3.260		106.00	69.00	336 3.260
3.300		106.00	69.00	336 3.300
3.400		112.00	73.00	336 3.400
3.440		112.00	73.00	336 3.440
3.450		112.00	73.00	336 3.450
3.500		112.00	73.00	336 3.500
3.570	9/64	112.00	73.00	336 3.570
3.600		112.00	73.00	336 3.600
3.660		112.00	73.00	336 3.660
3.700		112.00	73.00	336 3.700
3.730		112.00	73.00	336 3.730
3.800		119.00	78.00	336 3.800
3.860		119.00	78.00	336 3.860
3.900		119.00	78.00	336 3.900
3.910		119.00	78.00	336 3.910
3.970	5/32	119.00	78.00	336 3.970
3.990		119.00	78.00	336 3.990

d1		l1	l2	Order no.
mm	inch	mm	mm	
4.000		119.00	78.00	336 4.000
4.040		119.00	78.00	336 4.040
4.090		119.00	78.00	336 4.090
4.100		119.00	78.00	336 4.100
4.200		119.00	78.00	336 4.200
4.220		119.00	78.00	336 4.220
4.300		126.00	82.00	336 4.300
4.370	11/64	126.00	82.00	336 4.370
4.390		126.00	82.00	336 4.390
4.400		126.00	82.00	336 4.400
4.500		126.00	82.00	336 4.500
4.570		126.00	82.00	336 4.570
4.600		126.00	82.00	336 4.600
4.620		126.00	82.00	336 4.620
4.700		126.00	82.00	336 4.700
4.760	3/16	132.00	87.00	336 4.760
4.800		132.00	87.00	336 4.800
4.850		132.00	87.00	336 4.850
4.900		132.00	87.00	336 4.900
4.920		132.00	87.00	336 4.920
4.980		132.00	87.00	336 4.980
5.000		132.00	87.00	336 5.000
5.060		132.00	87.00	336 5.060
5.100		132.00	87.00	336 5.100
5.110		132.00	87.00	336 5.110
5.160	13/64	132.00	87.00	336 5.160
5.180		132.00	87.00	336 5.180
5.200		132.00	87.00	336 5.200
5.220		132.00	87.00	336 5.220
5.300		132.00	87.00	336 5.300
5.310		139.00	91.00	336 5.310
5.400		139.00	91.00	336 5.400
5.410		139.00	91.00	336 5.410
5.500		139.00	91.00	336 5.500
5.560	7/32	139.00	91.00	336 5.560
5.600		139.00	91.00	336 5.600
5.610		139.00	91.00	336 5.610
5.700		139.00	91.00	336 5.700
5.790		139.00	91.00	336 5.790
5.800		139.00	91.00	336 5.800
5.900		139.00	91.00	336 5.900
5.940		139.00	91.00	336 5.940
5.950	15/64	139.00	91.00	336 5.950
6.000		139.00	91.00	336 6.000
6.040		148.00	97.00	336 6.040
6.100		148.00	97.00	336 6.100
6.150		148.00	97.00	336 6.150
6.200		148.00	97.00	336 6.200
6.250		148.00	97.00	336 6.250
6.300		148.00	97.00	336 6.300
6.350	1/4	148.00	97.00	336 6.350
6.400		148.00	97.00	336 6.400
6.500		148.00	97.00	336 6.500
6.530		148.00	97.00	336 6.530
6.600		148.00	97.00	336 6.600
6.630		148.00	97.00	336 6.630
6.700		148.00	97.00	336 6.700
6.750	17/64	156.00	102.00	336 6.750
6.800		156.00	102.00	336 6.800
6.900		156.00	102.00	336 6.900
7.000		156.00	102.00	336 7.000
7.030		156.00	102.00	336 7.030
7.100		156.00	102.00	336 7.100
7.140	9/32	156.00	102.00	336 7.140
7.200		156.00	102.00	336 7.200
7.300		156.00	102.00	336 7.300

d1		l1	l2	Order no.
mm	inch	mm	mm	
7.370		156.00	102.00	336 7.370
7.400		156.00	102.00	336 7.400
7.490		156.00	102.00	336 7.490
7.500		156.00	102.00	336 7.500
7.540	19/64	165.00	109.00	336 7.540
7.600		165.00	109.00	336 7.600
7.670		165.00	109.00	336 7.670
7.700		165.00	109.00	336 7.700
7.800		165.00	109.00	336 7.800
7.900		165.00	109.00	336 7.900
7.940	5/16	165.00	109.00	336 7.940
8.000		165.00	109.00	336 8.000
8.030		165.00	109.00	336 8.030
8.100		165.00	109.00	336 8.100
8.200		165.00	109.00	336 8.200
8.300		165.00	109.00	336 8.300
8.400		165.00	109.00	336 8.400
8.500		165.00	109.00	336 8.500
8.600		175.00	115.00	336 8.600
8.610		175.00	115.00	336 8.610
8.700		175.00	115.00	336 8.700
8.730	11/32	175.00	115.00	336 8.730
8.800		175.00	115.00	336 8.800
8.840		175.00	115.00	336 8.840
8.900		175.00	115.00	336 8.900
9.000		175.00	115.00	336 9.000
9.090		175.00	115.00	336 9.090
9.100		175.00	115.00	336 9.100
9.200		175.00	115.00	336 9.200
9.300		175.00	115.00	336 9.300
9.340		175.00	115.00	336 9.340
9.350		175.00	115.00	336 9.350
9.400		175.00	115.00	336 9.400
9.500		175.00	115.00	336 9.500
9.520	3/8	184.00	121.00	336 9.520
9.700		184.00	121.00	336 9.700
9.750		184.00	121.00	336 9.750
9.800		184.00	121.00	336 9.800
9.900		184.00	121.00	336 9.900
10.000		184.00	121.00	336 10.000
10.200		184.00	121.00	336 10.200
10.500		184.00	121.00	336 10.500
10.750		195.00	128.00	336 10.750
10.800		195.00	128.00	336 10.800
10.900		195.00	128.00	336 10.900
11.000		195.00	128.00	336 11.000
11.500		195.00	128.00	336 11.500
11.800		195.00	128.00	336 11.800
11.910	15/32	205.00	134.00	336 11.910
12.000		205.00	134.00	336 12.000
12.500		205.00	134.00	336 12.500
13.000		205.00	134.00	336 13.000
13.500		214.00	140.00	336 13.500
14.000		214.00	140.00	336 14.000
14.500		220.00	144.00	336 14.500
15.000		220.00	144.00	336 15.000
15.500		227.00	149.00	336 15.500
16.000		227.00	149.00	336 16.000

Long series twist drills

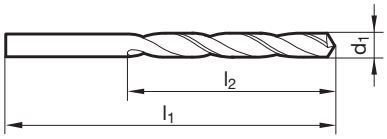
~10xD | GT 100 | DIN 340 | 130° | h8

Tool material	HSCO
Surface	F
Shank form	cyl.

P	•	web thinning ≥ Ø 1.000 • relieved cone • Co-alloyed high speed steel • wide flutes • especially high wear resistance • in case of poor chip evacuation
M	•	
K	•	
N	•	alloyed/unalloyed steels and castings over 800 N/mm² • hot and cold rolled steels • antifriction bearing steels • high-alloyed steels • heat treatable and case hardened steels
S		
H	○	

GÜHRINGNAVIGATOR

Cutting data page 316





Article no. **396**

d1 mm	inch	l1 mm	l2 mm	Order no.
1.000		56.00	33.00	396 1.000
1.100		60.00	37.00	396 1.100
1.200		65.00	41.00	396 1.200
1.300		65.00	41.00	396 1.300
1.400		70.00	45.00	396 1.400
1.500		70.00	45.00	396 1.500
1.600		76.00	50.00	396 1.600
1.700		76.00	50.00	396 1.700
1.800		80.00	53.00	396 1.800
1.900		80.00	53.00	396 1.900
2.000		85.00	56.00	396 2.000
2.100		85.00	56.00	396 2.100
2.200		90.00	59.00	396 2.200
2.300		90.00	59.00	396 2.300
2.400		95.00	62.00	396 2.400
2.500		95.00	62.00	396 2.500
2.700		100.00	66.00	396 2.700
2.800		100.00	66.00	396 2.800
2.900		100.00	66.00	396 2.900
3.000		100.00	66.00	396 3.000
3.100		106.00	69.00	396 3.100
3.200		106.00	69.00	396 3.200
3.300		106.00	69.00	396 3.300
3.400		112.00	73.00	396 3.400
3.500		112.00	73.00	396 3.500
3.600		112.00	73.00	396 3.600
3.700		112.00	73.00	396 3.700
3.800		119.00	78.00	396 3.800
3.900		119.00	78.00	396 3.900
4.000		119.00	78.00	396 4.000
4.100		119.00	78.00	396 4.100
4.200		119.00	78.00	396 4.200
4.300		126.00	82.00	396 4.300
4.400		126.00	82.00	396 4.400
4.500		126.00	82.00	396 4.500
4.700		126.00	82.00	396 4.700
4.800		132.00	87.00	396 4.800
4.900		132.00	87.00	396 4.900
5.000		132.00	87.00	396 5.000
5.100		132.00	87.00	396 5.100
5.200		132.00	87.00	396 5.200
5.300		132.00	87.00	396 5.300

d1 mm	inch	l1 mm	l2 mm	Order no.
5.400		139.00	91.00	396 5.400
5.500		139.00	91.00	396 5.500
5.600		139.00	91.00	396 5.600
5.800		139.00	91.00	396 5.800
6.000		139.00	91.00	396 6.000
6.100		148.00	97.00	396 6.100
6.200		148.00	97.00	396 6.200
6.400		148.00	97.00	396 6.400
6.500		148.00	97.00	396 6.500
6.600		148.00	97.00	396 6.600
6.700		148.00	97.00	396 6.700
6.800		156.00	102.00	396 6.800
6.900		156.00	102.00	396 6.900
7.000		156.00	102.00	396 7.000
7.200		156.00	102.00	396 7.200
7.300		156.00	102.00	396 7.300
7.400		156.00	102.00	396 7.400
7.500		156.00	102.00	396 7.500
7.600		165.00	109.00	396 7.600
7.700		165.00	109.00	396 7.700
7.800		165.00	109.00	396 7.800
7.900		165.00	109.00	396 7.900
8.000		165.00	109.00	396 8.000
8.100		165.00	109.00	396 8.100
8.200		165.00	109.00	396 8.200
8.300		165.00	109.00	396 8.300
8.400		165.00	109.00	396 8.400
8.500		165.00	109.00	396 8.500
8.600		175.00	115.00	396 8.600
8.700		175.00	115.00	396 8.700
8.800		175.00	115.00	396 8.800
8.900		175.00	115.00	396 8.900
9.000		175.00	115.00	396 9.000
9.100		175.00	115.00	396 9.100
9.200		175.00	115.00	396 9.200
9.300		175.00	115.00	396 9.300
9.400		175.00	115.00	396 9.400
9.500		175.00	115.00	396 9.500
9.600		184.00	121.00	396 9.600
9.700		184.00	121.00	396 9.700
9.800		184.00	121.00	396 9.800
9.900		184.00	121.00	396 9.900

d1		l1	l2	Order no.
mm	inch	mm	mm	
10.000		184.00	121.00	396 10.000
10.200		184.00	121.00	396 10.200
10.500		184.00	121.00	396 10.500
11.000		195.00	128.00	396 11.000
11.500		195.00	128.00	396 11.500
12.000		205.00	134.00	396 12.000

d1		l1	l2	Order no.
mm	inch	mm	mm	

Extra length twist drills, series 1

~15xD | GT 100 | DIN 1869 | 130° | h8

Tool material	HSCO
Surface	
Shank form	cyl.

P	•
M	•
K	•
N	•
S	•
H	○

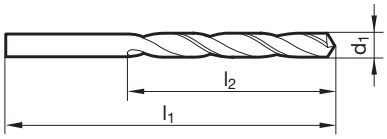
web thinning ≥ Ø 2.700 • relieved cone • Co-alloyed high speed steel • wide flutes • increased wear resistance • for extremely deep holes • in case of poor chip evacuation

high tensile steels and cast steels • grey cast iron, malleable and spheroidal iron

GÜHRINGNAVIGATOR

Cutting data page 316





Article no. **618**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
2.700		150.00	100.00	618 2.700
2.900		150.00	100.00	618 2.900
3.000		150.00	100.00	618 3.000
3.100		155.00	105.00	618 3.100
3.170	1/8	155.00	105.00	618 3.170
3.200		155.00	105.00	618 3.200
3.300		155.00	105.00	618 3.300
3.400		165.00	115.00	618 3.400
3.500		165.00	115.00	618 3.500
3.570	9/64	165.00	115.00	618 3.570
3.600		165.00	115.00	618 3.600
3.700		165.00	115.00	618 3.700
3.750		165.00	115.00	618 3.750
3.800		175.00	120.00	618 3.800
3.970	5/32	175.00	120.00	618 3.970
4.000		175.00	120.00	618 4.000
4.100		175.00	120.00	618 4.100
4.200		175.00	120.00	618 4.200
4.300		185.00	125.00	618 4.300
4.370	11/64	185.00	125.00	618 4.370
4.400		185.00	125.00	618 4.400
4.500		185.00	125.00	618 4.500
4.600		185.00	125.00	618 4.600
4.760	3/16	195.00	135.00	618 4.760
4.800		195.00	135.00	618 4.800
4.850		195.00	135.00	618 4.850
5.000		195.00	135.00	618 5.000
5.100		195.00	135.00	618 5.100
5.160	13/64	195.00	135.00	618 5.160
5.200		195.00	135.00	618 5.200
5.300		195.00	135.00	618 5.300
5.400		205.00	140.00	618 5.400
5.500		205.00	140.00	618 5.500
5.560	7/32	205.00	140.00	618 5.560
5.600		205.00	140.00	618 5.600
5.700		205.00	140.00	618 5.700

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
5.800		205.00	140.00	618 5.800
6.000		205.00	140.00	618 6.000
6.100		215.00	150.00	618 6.100
6.200		215.00	150.00	618 6.200
6.300		215.00	150.00	618 6.300
6.350	1/4	215.00	150.00	618 6.350
6.400		215.00	150.00	618 6.400
6.500		215.00	150.00	618 6.500
6.600		215.00	150.00	618 6.600
6.700		215.00	150.00	618 6.700
6.750	17/64	225.00	155.00	618 6.750
6.800		225.00	155.00	618 6.800
7.000		225.00	155.00	618 7.000
7.140	9/32	225.00	155.00	618 7.140
7.400		225.00	155.00	618 7.400
7.500		225.00	155.00	618 7.500
7.540	19/64	240.00	165.00	618 7.540
7.700		240.00	165.00	618 7.700
7.800		240.00	165.00	618 7.800
7.940	5/16	240.00	165.00	618 7.940
8.000		240.00	165.00	618 8.000
8.200		240.00	165.00	618 8.200
8.330	21/64	240.00	165.00	618 8.330
8.500		240.00	165.00	618 8.500
8.700		250.00	175.00	618 8.700
8.730	11/32	250.00	175.00	618 8.730
8.800		250.00	175.00	618 8.800
9.000		250.00	175.00	618 9.000
9.130	23/64	250.00	175.00	618 9.130
9.400		250.00	175.00	618 9.400
9.500		250.00	175.00	618 9.500
9.520	3/8	265.00	185.00	618 9.520
9.700		265.00	185.00	618 9.700
10.000		265.00	185.00	618 10.000

Extra length twist drills, series 2

~20xD | GT 100 | DIN 1869 | 130° | h8

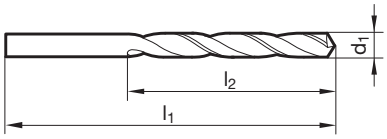
Tool material	HSCO
Surface	
Shank form	cyl.

P	•	web thinning ≥ Ø 3.000 • relieved cone • Co-alloyed high speed steel • wide flutes • increased wear resistance • for extremely deep holes • in case of poor chip evacuation
M	•	
K	•	
N	•	high tensile steels and cast steels • grey cast iron, malleable and spheroidal iron
S	•	
H	○	

GÜHRING NAVIGATOR

Cutting data page 316





Article no. **619**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
3.000		190.00	130.00	619 3.000
3.170	1/8	200.00	135.00	619 3.170
3.200		200.00	135.00	619 3.200
3.300		200.00	135.00	619 3.300
3.500		210.00	145.00	619 3.500
3.570	9/64	210.00	145.00	619 3.570
3.970	5/32	220.00	150.00	619 3.970
4.000		220.00	150.00	619 4.000
4.100		220.00	150.00	619 4.100
4.200		220.00	150.00	619 4.200
4.370	11/64	235.00	160.00	619 4.370
4.500		235.00	160.00	619 4.500
4.760	3/16	245.00	170.00	619 4.760
4.800		245.00	170.00	619 4.800
4.900		245.00	170.00	619 4.900
5.000		245.00	170.00	619 5.000
5.200		245.00	170.00	619 5.200
5.500		260.00	180.00	619 5.500
5.560	7/32	260.00	180.00	619 5.560
5.950	15/64	260.00	180.00	619 5.950
6.000		260.00	180.00	619 6.000
6.100		275.00	190.00	619 6.100
6.200		275.00	190.00	619 6.200
6.350	1/4	275.00	190.00	619 6.350

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
6.500		275.00	190.00	619 6.500
6.750	17/64	290.00	200.00	619 6.750
6.800		290.00	200.00	619 6.800
7.000		290.00	200.00	619 7.000
7.140	9/32	290.00	200.00	619 7.140
7.500		290.00	200.00	619 7.500
7.540	19/64	305.00	210.00	619 7.540
7.600		305.00	210.00	619 7.600
7.940	5/16	305.00	210.00	619 7.940
8.000		305.00	210.00	619 8.000
8.200		305.00	210.00	619 8.200
8.500		305.00	210.00	619 8.500
8.730	11/32	320.00	220.00	619 8.730
9.000		320.00	220.00	619 9.000
9.130	23/64	320.00	220.00	619 9.130
9.500		320.00	220.00	619 9.500
9.520	3/8	340.00	235.00	619 9.520
9.600		340.00	235.00	619 9.600
10.000		340.00	235.00	619 10.000

Extra length twist drills, series 3

~25xD | GT 100 | DIN 1869 | 130° | h8

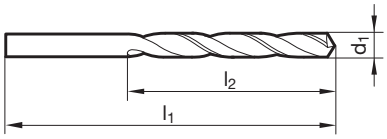
Tool material	HSCO
Surface	
Shank form	cyl.

P	•	web thinning ≥ Ø 2.500 • relieved cone • Co-alloyed high speed steel • wide flutes • increased wear resistance • for extremely deep holes • in case of poor chip evacuation
M	•	
K	•	
N	•	high tensile steels and cast steels • grey cast iron, malleable and spheroidal iron
S	•	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 316





Article no. **571**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
2.500		225.00	150.00	571 2.500
3.000		240.00	160.00	571 3.000
3.100		250.00	170.00	571 3.100
3.170	1/8	250.00	170.00	571 3.170
3.200		250.00	170.00	571 3.200
3.300		250.00	170.00	571 3.300
3.400		265.00	180.00	571 3.400
3.500		265.00	180.00	571 3.500
3.700		265.00	180.00	571 3.700
3.800		280.00	190.00	571 3.800
3.900		280.00	190.00	571 3.900
3.970	5/32	280.00	190.00	571 3.970
4.000		280.00	190.00	571 4.000
4.100		280.00	190.00	571 4.100
4.200		280.00	190.00	571 4.200
4.300		295.00	200.00	571 4.300
4.500		295.00	200.00	571 4.500
4.600		295.00	200.00	571 4.600
4.760	3/16	315.00	210.00	571 4.760
4.800		315.00	210.00	571 4.800
4.900		315.00	210.00	571 4.900
5.000		315.00	210.00	571 5.000
5.100		315.00	210.00	571 5.100
5.200		315.00	210.00	571 5.200
5.500		330.00	225.00	571 5.500
5.560	7/32	330.00	225.00	571 5.560
5.800		330.00	225.00	571 5.800
5.950	15/64	330.00	225.00	571 5.950
6.000		330.00	225.00	571 6.000
6.100		350.00	235.00	571 6.100
6.200		350.00	235.00	571 6.200
6.300		350.00	235.00	571 6.300
6.350	1/4	350.00	235.00	571 6.350
6.400		350.00	235.00	571 6.400
6.500		350.00	235.00	571 6.500
6.700		350.00	235.00	571 6.700

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
6.750	17/64	370.00	250.00	571 6.750
6.800		370.00	250.00	571 6.800
7.000		370.00	250.00	571 7.000
7.140	9/32	370.00	250.00	571 7.140
7.200		370.00	250.00	571 7.200
7.500		370.00	250.00	571 7.500
7.750		390.00	265.00	571 7.750
7.800		390.00	265.00	571 7.800
7.940	5/16	390.00	265.00	571 7.940
8.000		390.00	265.00	571 8.000
8.200		390.00	265.00	571 8.200
8.500		390.00	265.00	571 8.500
8.600		410.00	280.00	571 8.600
8.730	11/32	410.00	280.00	571 8.730
8.800		410.00	280.00	571 8.800
9.000		410.00	280.00	571 9.000
9.500		410.00	280.00	571 9.500
9.520	3/8	430.00	295.00	571 9.520
10.000		430.00	295.00	571 10.000
10.320	13/32	430.00	295.00	571 10.320
10.500		430.00	295.00	571 10.500
10.720	27/64	455.00	310.00	571 10.720
11.000		455.00	310.00	571 11.000
11.110	7/16	455.00	310.00	571 11.110
11.500		455.00	310.00	571 11.500
12.000		480.00	330.00	571 12.000
12.200		480.00	330.00	571 12.200
12.500		480.00	330.00	571 12.500
13.000		480.00	330.00	571 13.000

Extra length twist drills

>25xD | GT 100 | WN | 130° | h8

Tool material	HSS
Surface	
Shank form	cyl.

P	•
M	
K	•
N	•
S	
H	

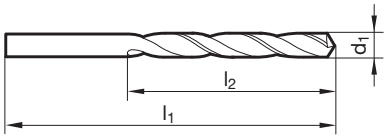
web thinning ≥ Ø 6.000 • relieved cone • wide flutes • for extremely deep holes • in case of poor chip evacuation

grey cast iron and steels up to 1000 N/mm² • Not recommended for: CrNi steels, stainless steels

GÜHRINGNAVIGATOR

Cutting data page 316





Article no. **242**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
6.000		500.00	400.00	242 6.000
8.000		500.00	400.00	242 8.000
10.000		600.00	500.00	242 10.000
11.000		600.00	500.00	242 11.000
12.000		600.00	500.00	242 12.000

d1 mm	d1 inch	l1 mm	l2 mm	Order no.

Extra length twist drills

>25xD | GT 100 | WN | 130° | h8

Tool material	HSS
Surface	◯
Shank form	cyl.

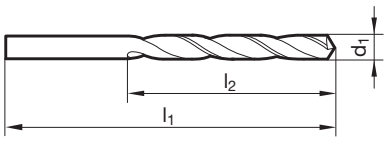
P	•
M	
K	•
N	•
S	
H	

web thinning ≥ Ø 8.000 • relieved cone • wide flutes • for extremely deep holes • in case of poor chip evacuation

grey cast iron and steels up to 1000 N/mm² • Not recommended for: CrNi steels, stainless steels

GÜHRINGNAVIGATOR

Cutting data page 316





Article no. **243**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
8.000		750.00	650.00	243 8.000
10.000		750.00	650.00	243 10.000
11.000		750.00	650.00	243 11.000
12.000		750.00	650.00	243 12.000

d1 mm	d1 inch	l1 mm	l2 mm	Order no.

Extra length twist drills

>25xD | GT 100 | WN | 130° | h8

Tool material	HSS
Surface	◯
Shank form	cyl.

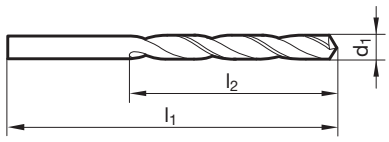
P	•
M	
K	•
N	•
S	
H	

web thinning ≥ Ø 10.000 • relieved cone • wide flutes • for extremely deep holes • in case of poor chip evacuation

grey cast iron and steels up to 1000 N/mm² • Not recommended for: CrNi steels, stainless steels

GÜHRINGNAVIGATOR

Cutting data page 316





Article no. **244**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
10.000		1000.00	850.00	244 10.000
11.000		1000.00	850.00	244 11.000
12.000		1000.00	850.00	244 12.000

d1 mm	d1 inch	l1 mm	l2 mm	Order no.

Extra length twist drills, series 1

~15xD | GT 100 | DIN 1870 | 130° | h8

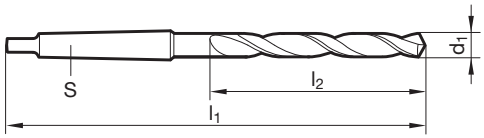
Tool material	HSCO
Surface	>Ø 16,0
Shank form	MT

P	•	web thinning ≥ Ø 9.520 • relieved cone • Co-alloyed high speed steel • wide flutes • increased wear resistance • for extremely deep holes • in case of poor chip evacuation
M	•	
K	•	
N	•	high tensile steels and cast steels • grey cast iron, malleable and spheroidal iron
S	•	
H	○	

GÜHRINGNAVIGATOR

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Article no. **620**

d1 mm	inch	S	l1 mm	l2 mm	Order no.
9.520	3/8	MK-1	285.00	185.00	620 9.520
10.000		MK-1	285.00	185.00	620 10.000
10.200		MK-1	285.00	185.00	620 10.200
10.320	13/32	MK-1	285.00	185.00	620 10.320
10.500		MK-1	285.00	185.00	620 10.500
11.000		MK-1	300.00	195.00	620 11.000
11.110	7/16	MK-1	300.00	195.00	620 11.110
11.500		MK-1	300.00	195.00	620 11.500
12.000		MK-1	310.00	205.00	620 12.000
12.300	31/64	MK-1	310.00	205.00	620 12.300
12.500		MK-1	310.00	205.00	620 12.500
12.700	1/2	MK-1	310.00	205.00	620 12.700
13.000		MK-1	310.00	205.00	620 13.000
13.500		MK-1	325.00	220.00	620 13.500
14.000		MK-1	325.00	220.00	620 14.000
14.290	9/16	MK-2	340.00	220.00	620 14.290
14.500		MK-2	340.00	220.00	620 14.500
15.000		MK-2	340.00	220.00	620 15.000

d1 mm	inch	S	l1 mm	l2 mm	Order no.
15.080	19/32	MK-2	355.00	230.00	620 15.080
15.500		MK-2	355.00	230.00	620 15.500
16.000		MK-2	355.00	230.00	620 16.000
16.500		MK-2	355.00	230.00	620 16.500
17.000		MK-2	355.00	230.00	620 17.000
17.500		MK-2	370.00	245.00	620 17.500
18.000		MK-2	370.00	245.00	620 18.000
18.500		MK-2	370.00	245.00	620 18.500
19.000		MK-2	370.00	245.00	620 19.000
20.000		MK-2	385.00	260.00	620 20.000
21.000		MK-2	385.00	260.00	620 21.000
22.000		MK-2	405.00	270.00	620 22.000
23.000		MK-2	405.00	270.00	620 23.000
25.500		MK-3	440.00	290.00	620 25.500
26.000		MK-3	440.00	290.00	620 26.000
29.370	1 5/32	MK-3	460.00	305.00	620 29.370
30.000		MK-3	460.00	305.00	620 30.000

Extra length twist drills, series 2

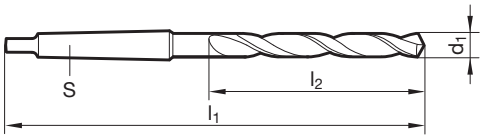
~20xD | GT 100 | DIN 1870 | 130° | h8

Tool material	**HSCO**
Surface	>Ø 16,0
Shank form	MT

P	•	web thinning ≥ Ø 9.520 • relieved cone • Co-alloyed high speed steel • wide flutes • increased wear resistance • in case of poor chip evacuation • for extremely deep holes
M	•	
K	•	
N	•	high tensile steels and cast steels • grey cast iron, malleable and spheroidal iron
S	•	
H	○	

GÜHRINGNAVIGATOR

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Article no. **621**

d1 mm	d1 inch	S	l1 mm	l2 mm	Order no.
10.000		MK-1	360.00	235.00	621 10.000
10.500		MK-1	360.00	235.00	621 10.500
10.720	27/64	MK-1	375.00	250.00	621 10.720
11.000		MK-1	375.00	250.00	621 11.000
11.500		MK-1	375.00	250.00	621 11.500
11.510	29/64	MK-1	375.00	250.00	621 11.510
12.000		MK-1	395.00	260.00	621 12.000
12.500		MK-1	395.00	260.00	621 12.500
12.700	1/2	MK-1	395.00	260.00	621 12.700
13.000		MK-1	395.00	260.00	621 13.000
13.500		MK-1	410.00	275.00	621 13.500
14.000		MK-1	410.00	275.00	621 14.000
14.500		MK-2	425.00	275.00	621 14.500
15.000		MK-2	425.00	275.00	621 15.000
16.000		MK-2	445.00	295.00	621 16.000
18.000		MK-2	465.00	310.00	621 18.000
18.500		MK-2	465.00	310.00	621 18.500
18.650	47/64	MK-2	465.00	310.00	621 18.650
19.000		MK-2	465.00	310.00	621 19.000
20.000		MK-2	490.00	325.00	621 20.000
21.430	27/32	MK-2	515.00	345.00	621 21.430
23.420	59/64	MK-3	535.00	345.00	621 23.420
29.500		MK-3	580.00	385.00	621 29.500

Twist drills with coolant ducts



Tool material	HSS
Surface	◯
Shank form	cyl.

P	•
M	○
K	•
N	•
S	•
H	

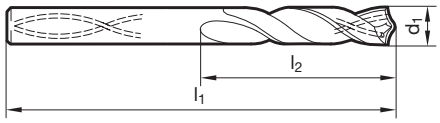
web thinning ≥ Ø 3.000 • relieved cone • also for drilling through drill bushes • especially for drilling depths > 5xD

laminated sheet metal • steel and cast steel, grey cast iron • austenitic steels up to 800 N/mm²

GÜHRINGNAVIGATOR

Cutting data page 316





Article no. **390**

d1 mm	l1 mm	l2 mm	Order no.	d1 mm	l1 mm	l2 mm	Order no.
3.000	100.00	66.00	390 3.000	7.500	156.00	102.00	390 7.500
3.300	106.00	69.00	390 3.300	8.000	165.00	109.00	390 8.000
3.500	112.00	73.00	390 3.500	8.500	165.00	109.00	390 8.500
4.000	119.00	78.00	390 4.000	9.000	175.00	115.00	390 9.000
4.200	119.00	78.00	390 4.200	9.500	175.00	115.00	390 9.500
4.500	126.00	82.00	390 4.500	10.000	184.00	121.00	390 10.000
5.000	132.00	87.00	390 5.000	10.200	184.00	121.00	390 10.200
5.500	139.00	91.00	390 5.500	10.500	184.00	121.00	390 10.500
6.000	139.00	91.00	390 6.000	11.000	195.00	128.00	390 11.000
6.500	148.00	97.00	390 6.500	11.500	195.00	128.00	390 11.500
6.800	156.00	102.00	390 6.800	12.000	205.00	134.00	390 12.000
7.000	156.00	102.00	390 7.000	13.000	205.00	134.00	390 13.000

Twist drills with coolant ducts

~5xD | GT 80 IK | WN | 130° | h8

Tool material	HSCO
Surface	◯
Shank form	HE

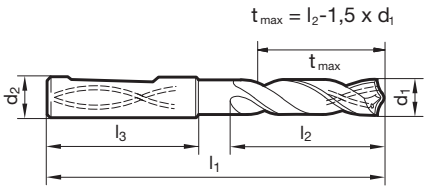
P	•
M	•
K	•
N	•
S	•
H	○

web thinning ≥ Ø 5.000 • relieved cone • Co-alloyed high speed steel

long chipping materials up to 1000 N/mm² • stainless steels • cast materials • non-ferrous metals

GÜHRING NAVIGATOR

Cutting data page 314





Article no. **1131**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.000		6.00	82.00	44.00	36.00	1131 5.000
5.500		6.00	82.00	44.00	36.00	1131 5.500
6.000		6.00	82.00	44.00	36.00	1131 6.000
6.350	1/4	8.00	91.00	53.00	36.00	1131 6.350
6.500		8.00	91.00	53.00	36.00	1131 6.500
6.800		8.00	91.00	53.00	36.00	1131 6.800
7.000		8.00	91.00	53.00	36.00	1131 7.000
7.140	9/32	8.00	91.00	53.00	36.00	1131 7.140
7.500		8.00	91.00	53.00		1131 7.500
7.800		8.00	91.00	53.00	36.00	1131 7.800
7.940		8.00	91.00	53.00	36.00	1131 7.940
8.000		8.00	91.00	53.00	36.00	1131 8.000
8.500		10.00	103.00	61.00	40.00	1131 8.500
8.730		10.00	103.00	61.00		1131 8.730
9.000		10.00	103.00	61.00	40.00	1131 9.000
9.500		10.00	103.00	61.00	40.00	1131 9.500
10.000		10.00	103.00	61.00	40.00	1131 10.000
10.200		12.00	118.00	71.00	45.00	1131 10.200
10.320	13/32	12.00	118.00	71.00	45.00	1131 10.320
10.500		12.00	118.00	71.00	45.00	1131 10.500
11.000		12.00	118.00	71.00	45.00	1131 11.000
11.110		12.00	118.00	71.00		1131 11.110
11.500		12.00	118.00	71.00	45.00	1131 11.500
12.000		12.00	118.00	71.00	45.00	1131 12.000

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
12.500		14.00	124.00	77.00	45.00	1131 12.500
12.700		14.00	124.00	77.00		1131 12.700
13.000		14.00	124.00	77.00	45.00	1131 13.000
13.500		14.00	124.00	77.00	45.00	1131 13.500
14.000		14.00	124.00	77.00	45.00	1131 14.000
14.290	9/16	16.00	133.00	83.00	48.00	1131 14.290
14.500		16.00	133.00	83.00	48.00	1131 14.500
15.000		16.00	133.00	83.00	48.00	1131 15.000
15.080		16.00	133.00	83.00	48.00	1131 15.080
15.500		16.00	133.00	83.00	48.00	1131 15.500
15.870	5/8	16.00	133.00	83.00	48.00	1131 15.870
16.000		16.00	133.00	83.00	48.00	1131 16.000
16.500		18.00	143.00	93.00	48.00	1131 16.500
17.000		18.00	143.00	93.00	48.00	1131 17.000
17.500		18.00	143.00	93.00	48.00	1131 17.500
18.000		18.00	143.00	93.00	48.00	1131 18.000
18.500		20.00	153.00	101.00	50.00	1131 18.500
19.000		20.00	153.00	101.00		1131 19.000
19.500		20.00	153.00	101.00	50.00	1131 19.500
20.000		20.00	153.00	101.00	50.00	1131 20.000

Twist drills with coolant ducts

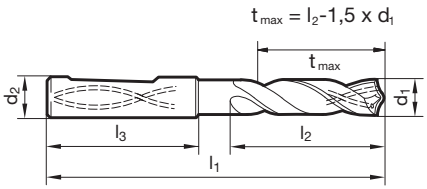
~5xD | GT 80 IK | WN | 130° | h8

Tool material	HSCO
Surface	S
Shank form	HE

P •	web thinning ≥ Ø 5.000 • relieved cone • Co-alloyed high speed steel • increased wear resistance
M •	
K •	
N •	long chipping materials up to 1000 N/mm² • stainless steels • cast materials • non-ferrous metals
S •	
H ○	

GÜHRINGNAVIGATOR

Cutting data page 314





Article no. **1132**

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
5.000		6.00	82.00	44.00	36.00	1132 5.000
5.500		6.00	82.00	44.00	36.00	1132 5.500
6.000		6.00	82.00	44.00	36.00	1132 6.000
6.350		8.00	91.00	53.00	36.00	1132 6.350
6.500		8.00	91.00	53.00	36.00	1132 6.500
6.800		8.00	91.00	53.00	36.00	1132 6.800
7.000		8.00	91.00	53.00	36.00	1132 7.000
7.500		8.00	91.00	53.00	36.00	1132 7.500
7.800		8.00	91.00	53.00	36.00	1132 7.800
8.000		8.00	91.00	53.00	36.00	1132 8.000
8.500		10.00	103.00	61.00	40.00	1132 8.500
8.730	11/32	10.00	103.00	61.00	40.00	1132 8.730
9.000		10.00	103.00	61.00	40.00	1132 9.000
9.500		10.00	103.00	61.00	40.00	1132 9.500
10.000		10.00	103.00	61.00	40.00	1132 10.000
10.200		12.00	118.00	71.00	45.00	1132 10.200
10.320	13/32	12.00	118.00	71.00	45.00	1132 10.320
10.500		12.00	118.00	71.00	45.00	1132 10.500
11.000		12.00	118.00	71.00	45.00	1132 11.000
11.500		12.00	118.00	71.00	45.00	1132 11.500
12.000		12.00	118.00	71.00	45.00	1132 12.000
12.500		14.00	124.00	77.00	45.00	1132 12.500
12.700		14.00	124.00	77.00	45.00	1132 12.700
13.000		14.00	124.00	77.00	45.00	1132 13.000

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	Order no.
13.500		14.00	124.00	77.00	45.00	1132 13.500
14.000		14.00	124.00	77.00	45.00	1132 14.000
14.500		16.00	133.00	83.00	48.00	1132 14.500
15.000		16.00	133.00	83.00	48.00	1132 15.000
15.500		16.00	133.00	83.00	48.00	1132 15.500
15.870	5/8	16.00	133.00	83.00	48.00	1132 15.870
16.000		16.00	133.00	83.00	48.00	1132 16.000
16.500		18.00	143.00	93.00	48.00	1132 16.500
17.000		18.00	143.00	93.00	48.00	1132 17.000
17.500		18.00	143.00	93.00	48.00	1132 17.500
18.000		18.00	143.00	93.00	48.00	1132 18.000
19.000		20.00	153.00	101.00	50.00	1132 19.000
19.500		20.00	153.00	101.00	50.00	1132 19.500
20.000		20.00	153.00	101.00	50.00	1132 20.000

90° NC spotting drills

N | WN | 90° | h6

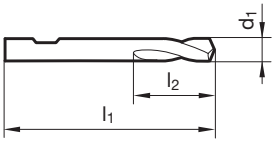
Tool material	HSCO
Surface	F
Shank form	B

P	•
M	•
K	•
N	•
S	○
H	

relieved cone • only suitable for spotting • ≥ Ø 6.0 mm with driving face to DIN 1835-B • inch dimensions are without clamping surface • Co-alloyed high speed steel • increased wear resistance

GÜHRINGNAVIGATOR

Cutting data page 306

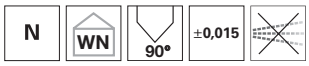




Article no. 5678

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
3.000		46.00	12.00	5678 3.000
4.000		55.00	12.00	5678 4.000
5.000		62.00	14.00	5678 5.000
6.000		66.00	16.00	5678 6.000
6.350	1/4	70.00	17.00	5678 6.350
8.000		79.00	21.00	5678 8.000
9.520	3/8	89.00	25.00	5678 9.520
10.000		89.00	25.00	5678 10.000
12.000		102.00	30.00	5678 12.000
12.700	1/2	102.00	30.00	5678 12.700
14.000		107.00	33.50	5678 14.000
15.870	5/8	115.00	37.50	5678 15.870
16.000		115.00	37.50	5678 16.000
19.050	3/4	131.00	45.00	5678 19.050
20.000		131.00	45.00	5678 20.000
25.000	63/64	151.00	53.00	5678 25.000
25.400	1	156.00	53.00	5678 25.400

90° NC spotting drills



Tool material	**Solid carbide**
Surface	F
Shank form	HB

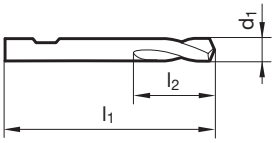
P	•
M	•
K	•
N	○
S	•
H	○

facet point grind • only suitable for spotting • ≥ Ø 6.0 mm with clamping surface shank form HB • inch dimensions are without clamping surface

universal material suitability

GÜHRINGNAVIGATOR

Cutting data page 306





Article no. **6027**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
4.000		55.00	12.00	6027 4.000
5.000		62.00	14.00	6027 5.000
6.000		66.00	16.00	6027 6.000
6.350	1/4	70.00	17.00	6027 6.350
8.000		79.00	21.00	6027 8.000
9.520	3/8	89.00	25.00	6027 9.520
10.000		89.00	25.00	6027 10.000
12.000		102.00	30.00	6027 12.000
12.700	1/2	102.00	30.00	6027 12.700
15.870	5/8	115.00	37.50	6027 15.870
16.000		115.00	37.50	6027 16.000
19.050	3/4	131.00	45.00	6027 19.050
20.000		131.00	45.00	6027 20.000

120° NC spotting drills

N | WN | 120° | h6

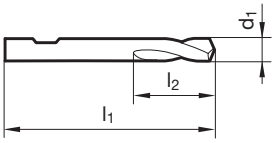
Tool material	HSCO
Surface	F
Shank form	B

P	•
M	•
K	•
N	•
S	○
H	

relieved cone • only suitable for spotting • ≥ Ø 6.0 mm with driving face to DIN 1835-B • inch dimensions are without clamping surface • Co-alloyed high speed steel • increased wear resistance

GÜHRINGNAVIGATOR

Cutting data page 306





Article no. 5679

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
3.000		46.00	12.00	5679 3.000
4.000		55.00	12.00	5679 4.000
5.000		62.00	14.00	5679 5.000
6.000		66.00	16.00	5679 6.000
6.350	1/4	70.00	17.00	5679 6.350
8.000		79.00	21.00	5679 8.000
9.520	3/8	89.00	25.00	5679 9.520
10.000		89.00	25.00	5679 10.000
12.000		102.00	30.00	5679 12.000
12.700	1/2	102.00	30.00	5679 12.700
15.870	5/8	115.00	37.50	5679 15.870
16.000		115.00	37.50	5679 16.000

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
19.050	3/4	131.00	45.00	5679 19.050
20.000		131.00	45.00	5679 20.000
25.000	63/64	151.00	53.00	5679 25.000
25.400	1	156.00	53.00	5679 25.400

120° NC spotting drills

N | WN | 120° | ±0,015

Tool material	**Solid carbide**
Surface	F
Shank form	HB

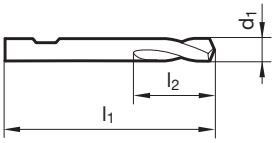
P	•
M	•
K	•
N	○
S	•
H	○

facet point grind • only suitable for spotting • ≥ Ø 6.0 mm with clamping surface shank form HB • inch dimensions are without clamping surface

universal material suitability

GÜHRINGNAVIGATOR

Cutting data page 306





Article no. **6028**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
3.000		46.00	12.00	6028 3.000
5.000		62.00	14.00	6028 5.000
6.000		66.00	16.00	6028 6.000
6.350	1/4	70.00	17.00	6028 6.350
8.000		79.00	21.00	6028 8.000
9.520	3/8	89.00	25.00	6028 9.520
10.000		89.00	25.00	6028 10.000
12.000		102.00	30.00	6028 12.000
12.700	1/2	102.00	30.00	6028 12.700
15.870	5/8	115.00	37.50	6028 15.870
16.000		115.00	37.50	6028 16.000
19.050	3/4	131.00	45.00	6028 19.050
20.000		131.00	45.00	6028 20.000

142° NC spotting drills

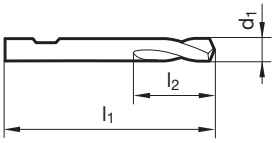


Tool material	**Solid carbide**
Surface	F
Shank form	HA/HB

P	•	facet point grind • only suitable for spotting • ≥ Ø 6.0 mm with clamping surface shank form HB • ≤ Ø 3.0 mm shank-Ø 4.0 mm with HA shank
M	•	
K	•	
N	○	universal material suitability
S	•	
H	○	

GÜHRINGNAVIGATOR

Cutting data page 306





Article no. **6029**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
1.000		50.00	3.00	6029 1.000
2.000		50.00	6.00	6029 2.000
3.000		50.00	9.00	6029 3.000
4.000		55.00	12.00	6029 4.000
5.000		62.00	14.00	6029 5.000
6.000		66.00	16.00	6029 6.000

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
8.000		79.00	21.00	6029 8.000
10.000		89.00	25.00	6029 10.000
12.000		102.00	30.00	6029 12.000
16.000		115.00	37.50	6029 16.000
20.000		131.00	45.00	6029 20.000

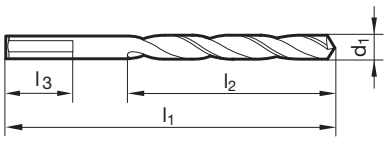
Jobber drills

~5xD | GU 3FS | DIN 338 | 135° | h8

Tool material	HSCO
Surface	●
Shank form	3-flats

P	●
M	●
K	●
N	●
S	○
H	

≥ Ø 4.00 mm with 3-flats on shank • 3-flats on shank prevent slipping in the chuck • for use in drilling machines with 3-jaw chucks • optimally suited for hand drilling machines and pillar drill machines • 4-facet point grind with split point ≥ Ø 1.000 • low feed force • fastest drilling progress • for universal application





Article no. **9000**

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
1.000		34.00	12.00	9000 1.000
1.500		40.00	18.00	9000 1.500
1.590	1/16	43.00	20.00	9000 1.590
1.980	5/64	49.00	24.00	9000 1.980
2.000		49.00	24.00	9000 2.000
2.380	3/32	57.00	30.00	9000 2.380
2.500		57.00	30.00	9000 2.500
2.780	7/64	61.00	33.00	9000 2.780
3.000		61.00	33.00	9000 3.000
3.180		65.00	36.00	9000 3.180
3.200		65.00	36.00	9000 3.200
3.300		65.00	36.00	9000 3.300
3.500		70.00	39.00	9000 3.500
3.570	9/64	70.00	39.00	9000 3.570
3.970	5/32	75.00	43.00	9000 3.970
4.000		75.00	43.00	9000 4.000
4.200		75.00	43.00	9000 4.200
4.370	11/64	80.00	47.00	9000 4.370
4.500		80.00	47.00	9000 4.500
4.760	3/16	86.00	52.00	9000 4.760
5.000		86.00	52.00	9000 5.000
5.100		86.00	52.00	9000 5.100
5.160	13/64	86.00	52.00	9000 5.160
5.200		86.00	52.00	9000 5.200
5.500		93.00	57.00	9000 5.500
5.560	7/32	93.00	57.00	9000 5.560
5.950	15/64	93.00	57.00	9000 5.950
6.000		93.00	57.00	9000 6.000
6.350	1/4	101.00	63.00	9000 6.350
6.500		101.00	63.00	9000 6.500
6.750	17/64	109.00	69.00	9000 6.750
6.800		109.00	69.00	9000 6.800
7.000		109.00	69.00	9000 7.000
7.150		109.00	69.00	9000 7.150
7.500		109.00	69.00	9000 7.500
7.540	19/64	117.00	75.00	9000 7.540

d1 mm	d1 inch	l1 mm	l2 mm	Order no.
7.940	5/16	117.00	75.00	9000 7.940
8.000		117.00	75.00	9000 8.000
8.330	21/64	117.00	75.00	9000 8.330
8.500		117.00	75.00	9000 8.500
8.730	11/32	125.00	81.00	9000 8.730
9.000		125.00	81.00	9000 9.000
9.130	23/64	125.00	81.00	9000 9.130
9.500		125.00	81.00	9000 9.500
9.530		133.00	87.00	9000 9.531
9.530	3/8	133.00	87.00	9000 9.530
9.920	25/64	133.00	87.00	9000 9.920
10.000		133.00	87.00	9000 10.000
10.200		133.00	87.00	9000 10.200
10.320	13/32	133.00	87.00	9000 10.320
10.500		133.00	87.00	9000 10.500
10.720	27/64	142.00	94.00	9000 10.720
11.000		142.00	94.00	9000 11.000
11.110	7/16	142.00	94.00	9000 11.110
11.500		142.00	94.00	9000 11.500
11.510	29/64	142.00	94.00	9000 11.510
11.910	15/32	151.00	101.00	9000 11.910
12.000		151.00	101.00	9000 12.000
12.300	31/64	151.00	101.00	9000 12.300
12.500		151.00	101.00	9000 12.500
12.700	1/2	151.00	101.00	9000 12.700
13.000		151.00	101.00	9000 13.000

Twist drill sets

~5xD | DIN 338 | GU 3FS | 135° | h8 | R

P	•
M	•
K	•
N	•
S	○
H	

≥ Ø 4.00 mm with 3-flats on shank • 3-flats on shank prevent slipping in the chuck • for use in drilling machines with 3-jaw chucks • optimally suited for hand drilling machines and pillar drill machines • 4-facet point grind with split point ≥ Ø 1.000 • low feed force • fastest drilling progress • for universal application

Tool material	**HSCO**
Surface	
Shank form	3-flats



	Article no.	**9001**

d1	increasing by	Pieces/set	**Order no.**
mm	mm	mm	
1.0-10.0	0.5	19	9001 0.013
1.0-13.0	0.5	25	9001 0.014

GÜHRINGNAVIGATOR Ratio drills

Generally 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!

Application recommendations for 7xD, 10xD and 12xD drills: Pilot holes are necessary for extra length SL drills 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 solid carbide drill, the drilling depth > 1xD.

2.) Alternatively solid carbide 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.

Article no.
Standard/DIN
Tool material
Carbide grade
Type
Surface
Cooling
Std. range page

Tools with bold feed column no. are preferred choice.

Drill Ø mm	Feed column no. 1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
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

Cooling:
- without coolant ducts
- with coolant ducts

Coolant:
- Air
- Neat oil
- Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
malleable cast iron	**0.7070** EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	●
Chilled cast iron	–		≤350 HB	●
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		● ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

≤3xD	≤3xD	≤3xD	≤5xD	≤3xD	≤5xD	≤3xD	≤5xD
5514	8524	5510	5511	8520	8521	6498	5498
6537K	6537K	6537K	6537L	6537K	6537L	6537K	6537L
Solid carbide	Solid carbide	Solid carbide		Solid carbide		Solid carbide	
K/P	K/P	K/P		K/P		K/P	
RT 100 U	RT 100 HF	RT 100 U		RT 100 HF		RT 100 XF	
F	Y	F		Y		F	
200	202	176	182	180	186	178	184







v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
130	7	130	7	145	7 7	145	7 7	200	8 8
110	6	110	6	120	6 6	120	6 6	200	7 7
145	8	145	8	170	8 8	170	8 8	200	8 8
110	7	110	7	145	8 8	145	8 8	200	8 8
120	7	120	7	130	8 8	130	8 8	180	8 8
110	7	110	7	125	7 7	125	7 7	160	8 8
105	7	105	7	120	7 7	120	7 7	130	8 8
105	7	105	7	120	7 7	120	7 7	120	8 8
100	6	100	6	105	7 7	105	7 7	120	7 7
130	8	130	8	145	8 8	145	8 8	180	8 8
120	7	120	7	120	7 7	120	7 7	120	8 8
85	5	85	5	85	5 5	85	5 5	110	7 7
100	6	100	6	110	7 7	110	7 7	110	7 7
90	5	90	5	105	5 5	105	5 5	100	5 5
65	6	65	6	80	6 6	80	6 6	90	7 7
55	5	55	5	65	5 5	65	5 5	65	6 6
		55	4	60	4 5	60	4 4	60	5 5
45	3	45	3	60	3 3	60	3 3	60	5 5
40	1	40	1	55	3 2	55	3 3	55	3 3
20	1	20	1	35	2 2	35	2 2		
40	2	40	2	60	5 5			80	5 5
15	1	15	1	55	2 2				
35	2	35	2	45	5 5			60	5 5
210	8			210	9 9			180	9 9
155	8			160	9 9			160	9 9
155	7			140	9 9			140	9 9
125	7			130	8 8			140	8 8
35	3			40	3 3				
								140	8 8
								140	8 8
								80	7 7
								80	7 7
25	4	25	4	35	4 4	35	4 4	30	4 4
15	1	15	1	45	4 4	45	4 4	40	4 4
15	1	15	1	40	3 3	40	3 3	35	3 3
260	9			310	9 9				
260	9			310	9 9				
220	9			260	9 9				
180	8			220	9 9				
260	8			280	8 8				
105	7			125	7 7				
270	8			325	8 8				
180	7			220	7 7				
105	6			125	7 7				
85	6			105	6 6				
80	5			90	6 6				
60	5			80	6 6				

GÜHRINGNAVIGATOR Ratio drills

Generally 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!

Application recommendations for 7xD, 10xD and 12xD drills: Pilot holes are necessary for extra length SL drills 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 solid carbide drill, the drilling depth > 1xD.

2.) Alternatively solid carbide 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.

Article no.
Standard/DIN
Tool material
Carbide grade
Type
Surface
Cooling
Std. range page

Tools with bold feed column no. are preferred choice.

Drill Ø mm	Feed column no. 1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
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

Cooling:
- without coolant ducts
- with coolant ducts

Coolant:
- Air
- Neat oil
- Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	● ●
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	● ●
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
malleable cast iron	**0.7070** EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	●
Chilled cast iron	–		≤350 HB	●
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	● ●
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	● ●
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		● ●
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		● ●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		● ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		● ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

≤ 7xD	≤ 7xD	≤ 7xD	≤ 12xD	≤ 3xD
5512	8522	5499	5525	1946
Company standard	Company standard	Company standard	Company standard	6537K
Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
K/P	K/P	K/P	K/P	K/P
RT 100 U	RT 100 HF	RT 100 XF	RT 100 U	N
F	Y	F	F	
188	192	190	193	204







v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
145	6	145	6	180	8	110	6		
120	5	120	5	180	7	110	5		
170	7	170	7	180	8	110	7		
145	7	145	7	180	8	100	7		
130	7	130	7	160	8	110	7		
125	6	125	6	140	8	110	6		
120	6	120	6	120	8	100	6		
120	6	120	6	110	8	110	6		
105	6	105	6	110	7	105	6	80	6
145	7	145	7	160	8	110	7		
120	6	120	6	110	8	110	6		
85	4	85	4	100	7	85	4	65	4
110	6	110	6	100	7	100	6		
105	4	105	4	90	5	80	4	80	4
80	5	80	5	80	7	80	5		
65	4	65	4	60	6	65	4		
60	4	60	3	55	5	50	4		
60	2	60	2	55	5	50	2		
55	2	55	2	45	3			40	2
35	1	35	1					30	1
60	4			70	5	60	4		
55	2					55	2		
45	4			50	5	45	4		
195	8			165	9	120	8	90	8
160	8			145	9	120	8	80	8
140	8			130	9	100	8	80	8
130	7			130	8	90	7	70	7
40	2							30	2
				130	8				
				130	8				
				70	7				
				70	7				
35	3	35	3	25	4				
40	3	45	3	35	4				
40	2	40	4	30	3				
310	8					150	8		
310	8					150	8		
260	8					150	8		
220	8					120	8		
280	7					150	7		
125	6					80	6		
325	7					120	7		
220	6					120	6		
125	6					40	6		
105	5								
90	5								
80	5					40	5		

GÜHRINGNAVIGATOR

Tools with bold feed column no. are preferred choice.
To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the Gühring Navigator on the internet: www.guehring.com.

Article no.
Standard/DIN
Tool material
Carbide grade
Type
Drilling depth/Point angle
Surface
Cooling
Std. range page

Drill Ø mm	Feed column no. NC spotting drills								
	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

Drill Ø mm	Feed column no. Micro-precision drills												
	56	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**
	f (mm/rev.)												
0.50	0.006	0.012	0.018	0.022	0.030	0.035	0.040	0.045	0.050	0.050	0.055	0.060	0.060
0.80	0.008	0.016	0.024	0.032	0.040	0.050	0.060	0.070	0.080	0.080	0.080	0.090	0.090
1.00	0.012	0.022	0.032	0.042	0.060	0.070	0.080	0.090	0.100	0.100	0.110	0.110	0.120
1.50	0.021	0.036	0.051	0.066	0.090	0.100	0.120	0.130	0.150	0.150	0.160	0.170	0.180
2.00	0.032	0.052	0.072	0.092	0.120	0.140	0.160	0.180	0.200	0.210	0.220	0.230	0.240
2.50	0.045	0.070	0.095	0.120	0.150	0.170	0.200	0.220	0.250	0.260	0.270	0.280	0.300
3.00	0.060	0.090	0.120	0.150	0.180	0.210	0.240	0.270	0.300	0.310	0.330	0.340	0.360

Coolant:
○ Air
● Neat oil
● Soluble oil

Cutting direction:
Ⓡ right-hand cutting

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
malleable cast iron	**0.7070** EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	●
Chilled cast iron	–		≤350 HB	●
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	● ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	● ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		● ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		● ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		● ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		● ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

ExclusiveLine micro-precision drills

6400	6401	6405	6408	6412
Company standard	Company standard	Company standard	Company standard	Company standard
Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
K/P	K/P	K/P	K/P	K/P
N	N	N	N	N
≤ 4xD	≤ 7xD	≤ 5xD	≤ 5xD	≤ 15xD
A	A	A	A	A
205	206	207	208	209







v_c m/min	Feed col. no.		v_c m/min	Feed col. no.		
100	64	62	105	62	58	58
100	64	62	100	62	58	58
100	64	62	105	62	59	59
90	63	61	90	61	59	59
90	64	62	95	62	58	58
90	64	62	95	62	58	58
90	63	61	90	61	58	58
90	63	61	90	61	58	58
70	62	60	70	60	58	58
100	63	61	100	61	57	57
85	63	61	85	61	58	58
70	62	60	70	60	58	58
70	62	60	70	60	57	57
60	62	60	60	60	57	57
50	62	60	60	60	58	58
60	62	60	60	60	58	58
60	57	57	60	57	57	57
60	57	57	60	57	57	57
30	57	57	70	57	57	57
15	56	56	60	56	56	56
30	57	57	70	57	57	57
130	68	66	150	60	60	60
130	68	66	140	60	60	60
130	68	66	140	60	60	60
120	67	65	130	60	60	60
10	56	56	25	56	56	56
15	56	56	35	56	56	56
15	56	56	35	56	56	56
70	68	68	100	68	68	68
70	68	68	100	68	68	68
135	59	59	135	59	59	59
135	59	59	135	59	59	59

GÜHRINGNAVIGATOR Ratio drills

Generally 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!

Application recommendations for 7xD, 10xD and 12xD drills: Pilot holes are necessary for extra length SL drills 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 solid carbide drill, the drilling depth > 1xD.

2.) Alternatively solid carbide 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.

	Article no.
	Standard/DIN
	Tool material
	Carbide grade
	Type
	Surface
	Cooling
	Std. range page

Tools with bold feed column no. are preferred choice.

Drill Ø mm	Feed column no. 1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
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

Cooling:
- without coolant ducts
- with coolant ducts

Coolant:
- Air
- Neat oil
- Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		
Nitriding steels	**1.8504** 34CrAl6	≤1000		
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	
Hardened steels	–		≤48 HRC	
			≤66 HRC	
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	
Chilled cast iron	–		≤350 HB	
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		
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	≤650		
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		
≤ 24 % 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	≤400		
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		
	2.0790 CuNi18Zn19Pb	≤850		
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		
Kevlar	Kevlar	≤1000		
Glass, carbon concentr. plastics	GFK/CFK	≤1000		

≤15xD	≤20xD	≤25xD	≤30xD	≤40xD
6509	6511	6512	6513	6514
Company standard	Company standard	Company standard	Company standard	Company standard
Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
K/P	K/P	K/P	K/P	K/P
RT 100 T	RT 100 T	RT 100 T	RT 100 T	RT 100 T
A	A	A	A	A
40 bar MQL	40 bar MQL	40 bar MQL	40 bar MQL	40 bar
195	196	197	198	199







v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
110	8			110	8			100	8			80	7			80	7
110	8			110	8			100	8			80	7			80	7
120	8			120	8			120	8			100	8			100	8
120	8			120	8			100	8			100	8			100	8
110	6			110	6			110	6			110	6			110	6
110	8			110	8			100	8			80	7			80	7
100	7			100	7			100	7			80	7			80	7
110	7	80	7	110	7	80	7	100	7	70	7	80	7	60	7	80	6-7
110	6	80	7	110	6	80	7	100	6	70	7	80	6	60	7	80	6
110	8			110	8			100	8			80	7			80	7
110	7	80	6-7	110	7	80	6-7	100	7	70	6-7	80	6	60	6-7	80	6
110	6	80	6-7	110	6	80	6-7	100	6	70	6-7	80	6	60	6-7	80	6
100	5			100	5			80	5			80	5			80	5
80	5			80	5			60	5			60	5			60	5
100	6-7			100	6			90	6			80	6			80	6-7
80	5			80	5			70	4			70	4			70	4
50	5			50	5			50	4			50	4			50	4
50	5			50	5			50	4			50	4			50	4
50	4			50	4			50	4			50	4			50	4
100	5			100	5			100	5			80	5			80	5
70	2-3			60	3			60	3			60	3			70	2-3
100	5			100	5			100	5			80	5			80	5
140	8			140	8			130	8			120	8			120	8
100	8			100	8			90	8			80	8			80	8
140	8			140	8			130	8			120	8			120	8
100	8			100	8			90	8			80	8	65	8	80	8
100	6			100	6			90	6			80	6			80	6
100	6			100	6			90	6			80	6			80	6
90	8	90	8	90	8	90	8	80	8	80	8	70	8	70	8	70	8
30	2			30	2			30	2			30	2			30	2
120	1			120	1			120	1			120	1			120	1
120	8			120	8			110	8			100	8			100	8

Drill Ø mm	Feed column no. 11	12	13	14	15	16	17	18
	f (mm/rev.)							
1.50	0.002	0.004	0.006	0.008	0.012	0.020	0.032	0.045
2.00	0.003	0.005	0.007	0.010	0.016	0.028	0.046	0.055
2.50	0.004	0.006	0.008	0.012	0.018	0.030	0.054	0.070
4.00	0.005	0.007	0.010	0.016	0.025	0.043	0.065	0.085
6.00	0.007	0.009	0.013	0.024	0.035	0.061	0.085	0.120
8.00	0.010	0.014	0.022	0.032	0.045	0.068	0.100	0.150
10.00	0.012	0.016	0.028	0.040	0.055	0.075	0.120	0.160
14.00	0.020	0.025	0.035	0.050	0.065	0.085	0.130	0.180
18.00	0.025	0.030	0.040	0.055	0.070	0.095	0.145	0.200
20.00	0.026	0.035	0.045	0.060	0.080	0.110	0.180	0.250
24.00	0.027	0.036	0.047	0.065	0.085	0.130	0.185	0.300
28.00	0.028	0.038	0.049	0.068	0.090	0.140	0.195	0.350
30.00	0.030	0.040	0.050	0.070	0.100	0.150	0.200	0.400
35.00	0.035	0.045	0.055	0.075	0.120	0.180	0.250	0.450
40.00	0.040	0.050	0.060	0.080	0.150	0.200	0.300	0.500

* The feed rates always relate to tools with the recommended coating.
In some cases the successful application of un-coated tools cannot be guaranteed.

Material dependent coolants:
○ Air
● Neat oil
◉ Soluble oil



All deep hole drills must have support for the pilot hole.
Deep hole drills must never operate at full speed without support in the machine shop.

Application advice
- For drilling depths in excess than 40 x D we recommend the use of two or more gun drills, e. g. Ø 10 x 400 mm and Ø 9.95 x 800 mm.
- Gun drills for drilling depths of more than 40 x D should enter the pilot hole revolving in the left hand direction.
- When changing tools for drilling depths of more than 40 x D, the tool can be damped by switching on coolant supply for just one second.
- For machining of long-chipping materials we recommend the use of gun drills with polished flutes.
- Generally we recommend the use of soluble oil with a minimum oil content of 10%.
- Single-fluted gun drills for long-chipping aluminium should be supplied with point grind 180° and coolant chamber.
- When spotting in aluminium with an Si-content of less than 1%, i.e. with recommended cutting rates vc > 160 m/min we recommend to advance to the final speed in several steps. In addition, a deeper pilot hole of approximately 3 x D should be produced.

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		◉
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		◉
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		◉
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		◉
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		◉
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		◉
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		◉
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		◉
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		◉
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		◉
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		◉
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		◉
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	◉ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	◉ ○
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	◉
malleable cast iron	**0.7070** EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	◉
Chilled cast iron	–		≤350 HB	◉
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	◉ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	◉ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		◉ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		◉ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		◉
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		◉
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		◉
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		◉ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		◉ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

Procedure
In order to achieve optimal machining results when producing deep holes with type RT 100 T especially spotting on radii or on an uneven surface structure, we recommend the following machining steps:

1. Initial milling of surface, i.e. with Guhring's centre cutting Ratio end mill RF 100 U. The surface must be machined at right angles to the entry angle of the drilling operation.
2. Production of a cylindrical pilot hole (tolerance G9) with a minimum drilling depth of 1 x D. For this operation we recommend our Ratio drills RT 100 U or RT 100 F respectively. Thanks to a 140° point angle and a m7 tolerance on diameter these Ratio drills are especially suitable for this machining task.
3. Entry of spiral-flute deep hole drill RT 100 T in the pilot hole at a speed of approx. 300 rev./min and with a feed rate of approx. 500 mm/min.
4. Setting of coolant pressure and speed.
5. Continuous drilling to complete hole depth without wood pecking.
6. For through holes with plain - i.e. 90° - exit, reduce feed rate v_f to 50 % approx. 1 mm prior to break-through.
7. For through holes with oblique exit, reduce the feed rate v_f to 40% approx. 1 mm prior to break-through.
8. After reaching hole depth stop machine spindle and coolant supply, withdrawal in top gear.



Ratio end mill RF 100 U, Article no. 5735
Thanks to its unequal helix angle, Gühring's FIRE-coated Ratio end mill RF 100 U offers highest feed rates and tool life for finishing and roughing operations in steel and cast materials as well as Ti- and Ni-alloys.



Ratio drill RT 100 F, Article no. 5510
Thanks to their special cutting edge geometry, Gühring's Ratio drills excel with very good self-centering characteristics and alignment accurate holes. Type U is especially suitable for the machining of steel and high-alloyed AlSi-alloys, type F for high-alloyed, stainless, acid- and heat-resistant steels, Al and Al-alloys, Mg and Mg-alloys as well as Ti and Ti-alloys.

EB100

Single-fluted gun drill

Solid carbide

1.0 ... 16.0



recom. coating	≤35xD v_c m/min	≤35xD Feed col. no.	>35xD v_c m/min	>35xD Feed col. no.
	100	15	100	15
	85	15	85	15
	90	15	90	15
	80	15	80	15
	80	14	80	14
	75	14	75	14
	75	14	75	14
A	75	14	75	14
A	65	14	65	14
A	80	15	80	15
	75	14	75	14
	65	14	65	14
A	75	14	75	14
A	65	14	65	14
A	75	13	75	13
A	65	13	65	13
A	55	12	55	12
A	65	13	65	13
	30	13	30	13
	25	10	25	14
	40	14	40	14
A	35	14	35	14
	35	14	35	14
	85	16	85	16
	80	16	85	16
	80	15	80	15
	70	15	70	15
	55	14	55	14
A	20	12	20	12
	35	12	35	12
	30	12	30	12
	150	17	150	17
	120	19	120	19
	120	20	120	20
	130	18	130	18
	110	17	110	17
A	75	15	75	15
	120	18	120	18
	90	18	90	18
	95	17	95	17
	75	17	75	17
	70	17	70	17
	60	17	60	17
	75	15	75	15
	70	15	70	15
	60	14	60	14
	50	14	50	14

EB80

Single-fluted gun drill

Solid carbide head

3.0 ... 32.0



recom. coating	≤35xD v_c m/min	≤35xD Feed col. no.	>35xD v_c m/min	>35xD Feed col. no.
S	100	14	95	13
	85	14	80	13
S	90	14	85	13
	80	14	75	13
	90	13	85	12
S	80	13	75	12
	75	13	70	12
S	75	13	70	12
	65	13	60	12
S	80	14	75	13
S	75	13	70	12
	65	13	60	12
C	75	13	70	12
	65	13	60	12
C	75	12	70	11
	65	12	60	11
C	55	11	50	11
C	65	12	60	12
	30	12	25	11
C	25	11	20	11
	55	13	50	12
C	45	13	40	12
	35	13	35	12
	85	15	80	14
	80	15	75	14
	80	14	75	13
	70	14	65	13
	55	13	50	12
C	20	11	20	11
	35	11	30	11
	30	11	25	11
C	150	16	140	15
	120	15	115	14
	150	16	140	15
	130	16	120	15
	110	16	100	15
C	75	14	70	13
	120	17	115	16
	90	17	85	16
	95	16	90	15
	75	16	70	15
	70	16	65	15
	60	16	55	15
	75	14	70	13
	70	14	65	13
	60	13	55	12
	50	13	45	12

GÜHRING NAVIGATOR

Tools with bold feed column no. are preferred choice.
To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the Gühring Navigator on the internet: www.guehring.com.

Article no. ®
Standard/DIN
Tool material
Carbide grade
Type
Drilling depth/Point angle
Surface
Cooling
Std. range page

Drill Ø mm	Feed column no. NC spotting drills								
	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

Drill Ø mm	Feed column no. Micro-precision drills												
	56	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**
	f (mm/rev.)												
0.50	0.006	0.012	0.018	0.022	0.030	0.035	0.040	0.045	0.050	0.050	0.055	0.060	0.060
0.80	0.008	0.016	0.024	0.032	0.040	0.050	0.060	0.070	0.080	0.080	0.080	0.090	0.090
1.00	0.012	0.022	0.032	0.042	0.060	0.070	0.080	0.090	0.100	0.100	0.110	0.110	0.120
1.50	0.021	0.036	0.051	0.066	0.090	0.100	0.120	0.130	0.150	0.150	0.160	0.170	0.180
2.00	0.032	0.052	0.072	0.092	0.120	0.140	0.160	0.180	0.200	0.210	0.220	0.230	0.240
2.50	0.045	0.070	0.095	0.120	0.150	0.170	0.200	0.220	0.250	0.260	0.270	0.280	0.300
3.00	0.060	0.090	0.120	0.150	0.180	0.210	0.240	0.270	0.300	0.310	0.330	0.340	0.360

○ ● ◉ ®

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		◉
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		◉
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		◉
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		◉
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		◉
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		◉
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		◉
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		◉
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		◉
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		◉
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		◉
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		◉
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	◉ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	◉ ○
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	◉
malleable cast iron	**0.7070** EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	◉
Chilled cast iron	–		≤350 HB	◉
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	◉ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	◉ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		◉ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		◉ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		◉
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		◉
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		◉
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		◉ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		◉ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

NC spotting drills

5678	6027	5679	6028	6029
Company standard	Company standard	Company standard	Company standard	Company standard
HSCO	Solid carbide	HSCO	Solid carbide	Solid carbide
	K10/K20		K10/K20	K10/K20
N	N	N	N	N
90°	90°	120°	120°	142°
F	F	F	F	F
289	290	291	292	293







v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
42	6	100	6	42	6	100	6	100	6
36	5	85	5	36	5	85	5	85	5
48	6	105	6	48	6	105	6	105	6
42	**6**	100	5	42	**6**	100	5	100	5
44	6	85	5	44	6	85	5	85	5
44	6	85	5	44	6	85	5	85	5
40	**5**	70	4	40	**5**	70	4	70	4
27	**4**	55	4	27	**4**	55	4	55	4
22	**3**	45	3	22	**3**	45	3	45	3
37	6	100	6	37	6	100	6	100	6
22	**4**	55	4	22	**4**	55	4	55	4
18	**3**	30	3	18	**3**	30	3	30	3
19	**4**			19	**4**				
15	**3**			15	**3**				
21	**4**	55	4	21	**4**	55	4	55	4
16	**3**			16	**3**				
12	3			12	3				
10	2			10	2				
		30	2			30	2	30	2
18	**3**	35	3	18	**3**	35	3	35	3
15	**3**	25	3	15	**3**	25	3	25	3
12	**3**	30	3	12	**3**	30	3	30	3
38	**6**	100	6	38	**6**	100	6	100	6
35	**6**	100	6	35	**6**	100	6	100	6
33	**6**	85	6	33	**6**	85	6	85	6
28	**6**	70	6	28	**6**	70	6	70	6
7	1	25	2	7	1	25	2	25	2
10	2	25	1	10	2	25	1	25	1
8	2	25	1	8	2	25	1	25	1
		230	7			230	7	230	7
85	7	230	7	85	7	230	7	230	7
65	7	165	7	65	7	165	7	165	7
65	6	165	6	65	6	165	6	165	6
80	6	230	6	80	6	230	6	230	6
70	5	200	5	70	5	200	5	200	5
75	**5**	200	5	75	**5**	200	5	200	5
50	**5**	135	5	50	**5**	135	5	135	5
45	**5**	100	4	45	**5**	100	4	100	4
40	**4**	85	4	40	**4**	85	4	85	4
25	**4**	55	4	25	**4**	55	4	55	4
20	**4**	45	4	20	**4**	45	4	45	4
25	**4**	65	4	25	**4**	65	4	65	4
40	**4**	95	5	40	**4**	95	5	95	5

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Article no.
Standard/DIN
Tool material
Carbide grade
in combination with holder
Surface
Application
Std. range page

Drill Ø mm	Feed column no. 1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
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

Coolant:
○ Air
● Neat oil
◍ Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		◍
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		◍
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		◍
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		◍
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		◍
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		◍
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		◍
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		◍
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		◍
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		◍
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		◍
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		◍
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	◍ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	◍ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	◍
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	◍
Chilled cast iron	–		≤350 HB	◍
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	◍ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	◍ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		◍ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		◍ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		◍
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		◍
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		◍
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		◍ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		◍ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

≤ 1×D / ≤ 1.5×D

4112	4115	4114	4111	4229
Co. std.	Co. std.	Co. std.	Co. std.	Co. std.
Sol. car.	Sol. car.	Sol. car.	Sol. car.	Sol. car.
K/P	K/P	K/P	K/P	K/P
4106	4106	4106	4106	4106
F	a	○	a	F
P	M	N	pil./ counters.	steel beams
223	229	226	220	232

≤ 3×D

4112	4115	4114	4111	4229
Co. std.	Co. std.	Co. std.	Co. std.	Co. std.
Sol. car.	Sol. car.	Sol. car.	Sol. car.	Sol. car.
K/P	K/P	K/P	K/P	K/P
4107	4107	4107	4107	4107
F	a	○	a	F
P	M	N	pil./ counters.	steel beams
223	229	226	220	232












v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
130	6					130	6	100	5	130	6					130	6	90	5
110	5					110	5	80	5	110	5					110	5	75	5
130	7					130	7			130	7					130	7		
110	6					110	6			110	6					110	6		
130	6					130	6			130	6					130	6		
125	6					125	6			125	6					125	6		
110	5					110	5			110	5					110	5		
110	6					110	6			110	6					110	6		
90	5					90	5			90	5					90	5		
130	7					130	7			130	7					130	7		
110	6					110	6			110	6					110	6		
70	4					70	4			70	4					70	4		
105	5					105	5			105	5					105	5		
70	4					70	4			70	4					70	4		
60	5					60	5			60	5					60	5		
55	4					55	4			55	4					55	4		
55	3					55	3			55	3					55	3		
50	2					50	2			50	2					50	2		
		25	2			25	2					25	2			25	2		
		55	3			55	3					55	3			55	3		
		40	3			40	3					40	3			40	3		
		35	3			35	3					35	3			35	3		
						100	6									100	6		
						90	6									90	6		
						120	7									120	7		
						100	6									100	6		
		90	6			90	6					90	6			90	6		
						80	5									80	5		
						80	5									80	5		
						80	5									80	5		
						80	5									80	5		
		25	2			25	2					25	2			25	2		
		40	3			40	3					40	3			40	3		
		35	2			35	2					35	2			35	2		
				200	7	200	7							200	7	200	7		
				180	7	180	7							180	7	180	7		
				150	7	150	7							150	7	150	7		
				120	7	120	7							120	7	120	7		
				180	7	180	7							180	7	180	7		
				70	6	70	6							70	6	70	6		
				180	7	180	7							180	7	180	7		
				120	6	120	6							120	6	120	6		
				70	6	70	6							70	6	70	6		
				50	6	50	6							50	6	50	6		
				45	6	45	6							45	6	45	6		
				35	5	35	5							35	5	35	5		

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Article no.
Standard/DIN
Tool material
Carbide grade
in combination with holder
Surface
Application
Std. range page

Drill Ø mm	Feed column no. 1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
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

Coolant:
○ Air
● Neat oil
◍ Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		◍
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		◍
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		◍
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		◍
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		◍
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		◍
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		◍
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		◍
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		◍
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		◍
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		◍
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		◍
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	◍ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	◍ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	◍
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	◍
Chilled cast iron	–		≤350 HB	◍
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	◍ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	◍ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		◍ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		◍ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		◍
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		◍
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		◍
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		◍ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		◍ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

≤5×D

4112	4115	4114	4111	4229
Co. std.	Co. std.	Co. std.	Co. std.	Co. std.
Sol. car.	Sol. car.	Sol. car.	Sol. car.	Sol. car.
K/P	K/P	K/P	K/P	K/P
4108	4108	4108	4108	4108
F	a	○	a	F
P	M	N	pil./ counters.	steel beams
223	229	226	220	232

≤7×D

4112	4115	4114	4111	4229
Co. std.	Co. std.	Co. std.	Co. std.	Co. std.
Sol. car.	Sol. car.	Sol. car.	Sol. car.	Sol. car.
K/P	K/P	K/P	K/P	K/P
4109	4109	4109	4109	4109
F	a	○	a	F
P	M	N	pil./ counters.	steel beams
223	229	226	220	232



v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
125	6					130	6	90	5	120	5					130	6	90	5
105	5					110	5	75	5	105	4					110	5	75	5
125	7					130	7			120	6					130	7		
105	6					110	6			105	5					110	6		
125	6					130	6			120	5					130	6		
120	6					125	6			110	5					125	6		
105	5					110	5			100	4					110	5		
105	6					110	6			100	5					110	6		
85	5					90	5			85	4					90	5		
125	7					130	7			120	6					130	7		
105	6					110	6			100	5					110	6		
70	4					70	4			70	4					70	4		
105	5					105	5			105	4					105	5		
70	4					70	4			70	3					70	4		
55	5					60	5			55	4					60	5		
50	4					55	4			50	3					55	4		
55	3					55	3			55	2					55	3		
50	2					50	2			50	2					50	2		
		25	2			25	2					25	1			25	2		
		55	3			55	3					55	2			55	3		
		40	3			40	3					40	2			40	3		
		35	3			35	3					35	2			35	3		
						100	6									100	6		
						90	6									90	6		
						120	7									120	7		
						100	6									100	6		
		90	6			90	6					70	6			90	6		
						80	5									80	5		
						80	5									80	5		
						80	5									80	5		
						80	5									80	5		
		25	2			25	2					25	1			25	2		
		40	3			40	3					40	2			40	3		
		35	2			35	2					35	1			35	2		
				180	7	200	7							180	6	200	7		
				180	7	180	7							180	6	180	7		
				140	7	150	7							140	6	150	7		
				110	7	120	7							110	6	120	7		
				180	7	180	7							180	6	180	7		
				70	6	70	6							70	5	70	6		
				180	7	180	7							180	6	180	7		
				120	6	120	6							120	5	120	6		
				70	6	70	6							70	5	70	6		
				50	6	50	6							50	5	50	6		
				45	6	45	6							45	5	45	6		
				35	5	35	5							35	4	35	5		

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All data are approximate values. The actually achievable cutting speeds and feed rates depend on the respective machining conditions. We recommend suitable drilling trials.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the Gühring Navigator on the internet: www.guehring.com.

Article no.
Standard/DIN
Tool material
Carbide grade
in combination with holder
Surface
Application
Std. range page

Drill Ø mm	Feed column no. 1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
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

Coolant:
○ Air
● Neat oil
● Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	○
Chilled cast iron	–		≤350 HB	○
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

≤ 10×D

4112	4115	4114	4111	4229
Co. std.	Co. std.	Co. std.	Co. std.	Co. std.
Sol. car.	Sol. car.	Sol. car.	Sol. car.	Sol. car.
K/P	K/P	K/P	K/P	K/P
4110	4110	4110	4110	4110
F	a	○	a	F
P	M	N	pil./ counters.	steel beams
223	229	226	220	232







v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
100	5					130	6	85	4
95	4					110	5	70	4
100	6					130	7		
95	5					110	6		
100	5					130	6		
95	5					125	6		
90	4					110	5		
90	5					110	6		
85	4					90	5		
100	6					130	7		
90	5					110	6		
70	4					70	4		
95	4					105	5		
70	3					70	4		
55	4					60	5		
50	3					55	4		
55	2					55	3		
50	2					50	2		
		25	1			25	2		
		55	2			55	3		
		40	2			40	3		
		35	2			35	3		
						100	6		
						90	6		
						120	7		
						100	6		
		70	6			90	6		
						80	5		
						80	5		
						80	5		
						80	5		
		25	1			25	2		
		40	2			40	3		
		35	1			35	2		
				150	6	200	7		
				150	6	180	7		
				130	6	150	7		
				105	6	120	7		
				150	6	180	7		
				70	5	70	6		
				150	6	180	7		
				110	5	120	6		
				70	5	70	6		
				50	5	50	6		
				45	5	45	6		
				35	4	35	5		

GÜHRINGNAVIGATOR

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To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the Gühring Navigator on the internet: www.guehring.com.

Article no.
Standard/DIN
Tool material
Surface
Type
Cooling
Std. range page

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

Coolant:
○ Air
● Neat oil
● Soluble oil

Cutting direction:
Ⓡ right-hand cutting
Ⓛ left-hand cutting

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	○
Chilled cast iron	–		≤350 HB	○
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

≤ 3xD

515
1897
HSS-E-PM
F
GT 500
267

≤ 5xD

622
338
HSCO
>Ø 2,36
GT 100
269

2459
338
HSCO
F
GT 100
272

1131
Company standard
HSCO
GT 80 IK
287

1132
Company standard
HSCO
S
GT 80 IK
288











vc m/min	Feed col. no.	vc m/min	Feed col. no.	vc m/min	Feed col. no.	vc m/min	Feed col. no.	vc m/min	Feed col. no.
30	**6**	35	5	42	6	48	7	60	7
24	**5**	30	5	36	5	38	6	48	6
33	**6**	40	5	48	6	48	7	60	7
33	5	40	**5**	42	**6**	38	6	48	6
28	**5**	40	5			48	6	60	6
28	**5**	40	5	48	6	48	6	60	6
25	4	35	4	42	5	38	**5**	50	**5**
22	4	20	**4**	30	**5**	28	**5**	33	**5**
		16	**3**	34	**4**	26	**4**	31	**4**
33	**6**	36	6	48	6	43	7	55	7
20	4	20	4	24	5	25	**5**	31	**5**
		15	**3**	20	**4**	24	**4**	31	**4**
14	4	16	4	24	5	25	**5**	30	**5**
		12	**3**	20	**4**	20	**4**	24	**4**
18	4	15	4	21	5	24	5	30	5
		12	**3**	16	**4**	16	**4**	20	**4**
		15	**3**	17	**4**	14	**4**	18	**4**
		8		11	3	12	**3**	15	**3**
				6	1	4	**3**	5	**3**
		18	**4**	22	**5**	20	**5**	25	**5**
		14	2	17	4	14	**4**	18	**4**
		16	3	20	4	16	**4**	20	**4**
33	6	35	6	45	7	48	7	60	7
33	6	30	6	40	7	38	**7**	48	**7**
28	**6**	30	6	36	7	42	7	52	7
22	6	28	6	29	7	32	**7**	40	**7**
		10	3	14	4	12	**4**	15	**4**
		8		7		10	**2**	12	**2**
		10		12		14	3	18	3
		6		8		10	**3**	12	**3**
		80	7	85	8	95	7	120	7
		70	6	72	7	75	8	95	8
80	6								
65	5	40	5	96	6	90	6	100	6
75	5								
45	5	40	4			45	6	55	6
33	**4**								
27	**4**			40		48	5	60	5
16	**4**	20	4	25	5	45	5	55	5
15	**4**	15	**4**	20	**5**	38	**5**	45	**5**
22	4	20	4	24	5				
36	5					38	6	48	6

GÜHRINGNAVIGATOR

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Article no.
Standard/DIN
Tool material
Surface
Type
Cooling
Std. range page

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

Coolant:
○ Air
● Neat oil
● Soluble oil

Cutting direction:
Ⓡ right-hand cutting
Ⓛ left-hand cutting

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	○
Chilled cast iron	–		≤350 HB	○
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

> 10xD

242	243	244
Co. std.	Co. std.	Co. std.
HSS	HSS	HSS
GT 100	GT 100	GT 100
281	282	283

618	619	620	621
1869 R1	1869 R2	1870 R1	1870 R2
HSCO	HSCO	HSCO	HSCO
GT 100	GT 100	GT 100	GT 100
278	279	284	285

571
1869 R3
HSCO
GT 100
280

≤ 10xD

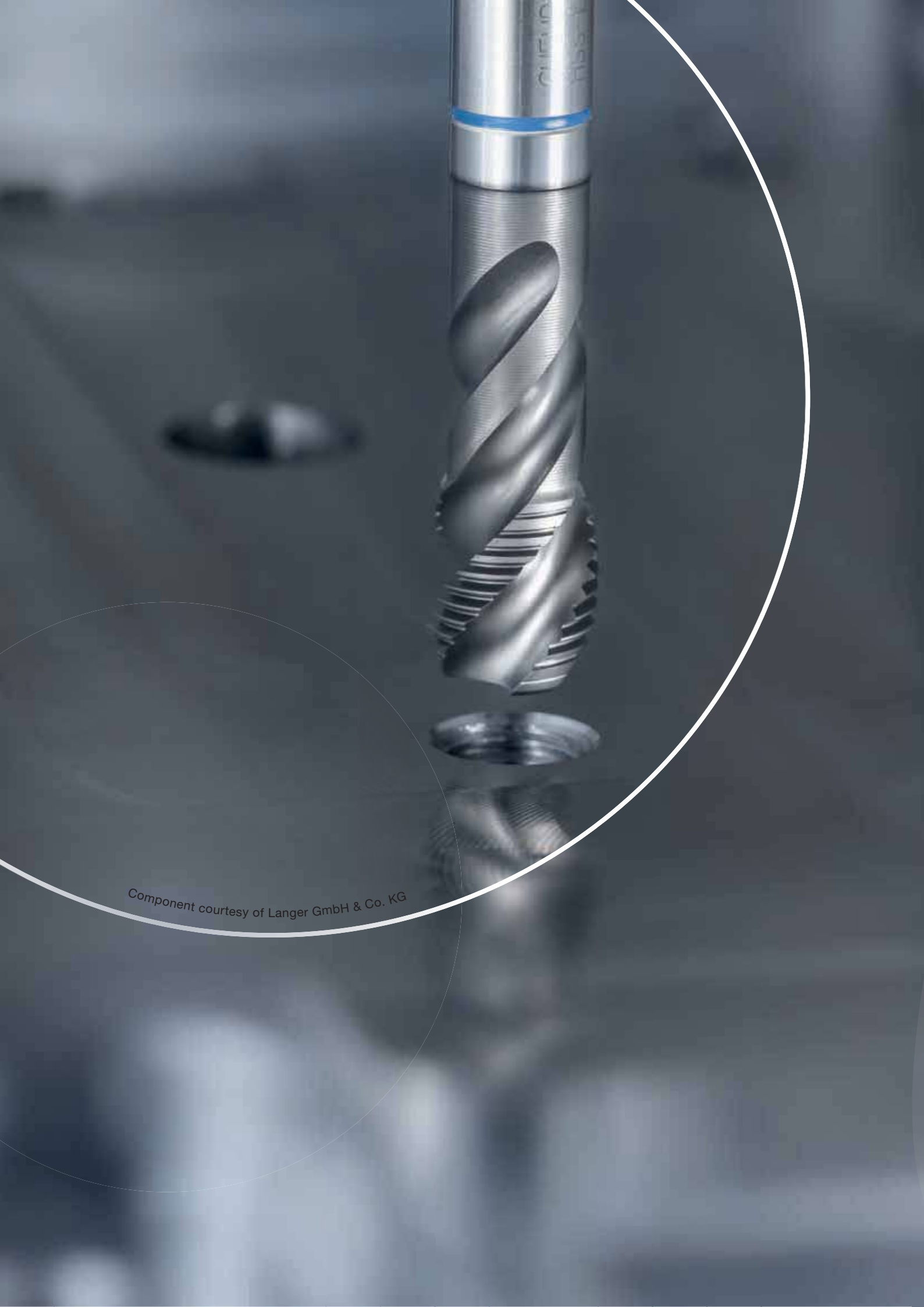
390
Co. std.
HSS
N
286

336
340
HSCO
GT 100
274

396
340
HSCO
GT 100
276



v_c m/min	Feed col. no.			v_c m/min	Feed col. no.				v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
22	5	5	5	30	4	4	4	4	30	4	26	6	33	5	36	5
18	4	4	4	25	4	4	4	4	25	4	22	5	27	5	30	4
22	5	5	5	33	4	4	4	4	33	4	30	6	36	5	40	5
18	4	4	4	30	4	4	4	4	30	4	30	5	32	5	36	5
22	4	4	4	33	4	4	4	4	33	4	24	5	36	5	40	5
18	4	4	4	33	4	4	4	4	33	4	24	5	36	5	40	5
				20	3	3	3	3	20	3	22	4	22	4	26	4
				14	3	3	3	3	14	3	20	4	18	4	18	4
				10	2	2	2	2	10	2	14	3	14	3	15	3
22	5	5	5	29	4	4	4	4	29	4	30	6	32	5	32	5
				14	3	3	3	3	14	3	17	4	18	4	20	4
				10	2	2	2	2	10	2	12	3	13	3	18	3
				10	3	3	3	3	10	3	14	4	14	4	18	4
				8	2	2	2	2	8	2	10	3	10	3	12	3
12	3	3	3	11	3	3	3	3	11	3	15	4	13	4	15	4
6	2	2	2	8	2	2	2	2	8	2	10	3	10	3	12	3
				8	2	2	2	2	8	2	10	3	12	3	14	3
				5	1	1	1	1	5	1	7	2	6	2	9	3
				3	1	1	1	1	3	1			4	1	5	1
				10	3	3	3	3	10	3			12	4	14	4
				8	2	2	2	2	8	2			8	2	10	3
				10	2	2	2	2	10	2			10	3	12	3
22	5	5	5								30	6	32	6	35	6
18	5	5	5	20	5	5	5	5	20	5	30	6	27	6	30	6
20	5	5	5								24	6	26	6	30	6
14	5	5	5	16	5	5	5	5	16	5	20	6	24	6	26	6
				5	2	2	2	2	5	2	7	3	6	3	12	3
				5	1	1	1	1	5	1			5			
				6	1	1	1	1	6	1			8			
				5	1	1	1	1	5	1			5			
											80	6				
45	6	6	6	50	6	6	6	6	50	6	50	7	70	7	77	7
36	5	5	5	40	5	5	5	5	40	5	50	6	60	6	66	6
55	5	5	5										60			
22	4	4	4	30	4	4	4	4	30	4	60	5	36	5	40	6
				45	4	4	4	4	45	4			54	5		
28	4	4	4	30	4	4	4	4	30	4	40	5	36	5	40	6
22	3	3	3	25	4	4	4	4	25	4			30	5		
20	3	3	3	20	4	4	4	4	20	4	24	4	24	5		
18	3	3	3	16	3	3	3	3	16	3	24	4	18	4	21	5
				10	3	3	3	3	10	3	22	4	13	4	15	5
12	3	3	3	14	3	3	3	3	14	3			16	4	30	5
18	4	4	4	20	3	3	3	3	20	3	24	5	26			



Component courtesy of Langer GmbH & Co. KG

THREADING

3

Circular thread milling cutters	P. 336
Thread milling cutters	P. 338
Taps for hard machining	P. 351
Pionex high-performance taps	P. 357
High-performance taps for steel	P. 368
Pionex high-performance fluteless taps	P. 376

THREADING
OVERVIEW

Circular thread milling cutters

P M N H S K

- Circular thread milling cutters for high-strength and hardened steels combine core hole and thread production with one tool. The MTMH3-Z guarantees process reliability and gauge-containing threads in almost all materials up to 66 HRC.

Thread milling cutters

P M N H S K

- Thread milling cutters are suitable for both right-hand and left-hand threads and allow different thread tolerances to be produced with just one tool. Thanks to the low cutting pressure, Gühring thread milling cutters are also ideally suited for higher-strength materials. In addition to specially designed thread milling cutters for hard machining up to 66 HRC, the range also includes tools for universal use. Within their machining areas, the thread milling cutters promise absolute process reliability and high productivity.

Taps for hard machining

H

- Due to their negative rake angle, solid carbide taps are suitable for machining hardened steels between 55 and 62 HRC. The PM HSS-E taps, on the other hand, are designed for use in steels with a hardness between 45 and 55 HRC.

Pionex high-performance taps

P M N S K

- The high-performance Pionex taps for blind and through-hole machining impress with versatile designs. The taps promise high cutting speeds and a long service life.

High-performance taps for steel

P

- The high-performance taps are specially designed for high-strength steels up to 1200 N/mm^2.

Pionex high-performance fluteless taps

P M N S K

- High-performance fluteless taps that significantly reduce the temperature during fluteless tapping thanks to an optimised lubrication groove and polygon shape. In addition, the torque and axial force are reduced by up to 30 %, which greatly increases the tool life of the fluteless tap.



P. 336



P. 338



P. 351



P. 357



P. 368



P. 376



BLIND
HOLES

Thread depth		≤3xD			≤1.5xD	
Tool material		HSS-E			HSS-E-PM	
Form		C	C	C	C	C
Surface		A	A	C	A	S
Cutting direction		R	R	R	R	R
Coolant delivery		☒	☒	☒	☒	☒
Shank tolerance		h9	h9	h9	h9	h9 + HB
						

● = Neat oil
● = Soluble oil
△ = Paste
□ = Minimal quantity lubrication (MQL)

Thread type	Tolerance	Article no./page				
M	6H			1916/1917 *P.368/9*	1577/1578 *P.370/1*	
	6HX	393 *P. 357*	4633 *P. 359*			
	6GX	4625 *P. 358*				
	7GX	4626 *P. 358*				
	6H+0,1	4627 *P. 358*				
MF	6H					
	6HX	394 *P. 364*				
	6GX	4628 *P. 364*				
G	- X	395 *P. 366*				
NPT	-					1088 *P. 374*
RC „BSPT“	-					
	Suitable lubricant:	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△

		Group of materials	Tensile strength	Material example	Material no.	Recommended cutting speed v_c [m/min]				
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**20**	**20**			**15**
P	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	**15**	**15**	10	8	**12**
P	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	**10**	**10**	**12**	**8**	8
M	M1	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	**12**	**12**			**8**
M	M2	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	**10**	**10**			**6**
M	M3	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	6	6			
K	K1	Cast Iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	20	20			15
K	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	20	20			10
K	K3	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		10	10			6
N	N1	Aluminium and wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	10	10			8
N	N2	Al cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	20	20			15
N	N3	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08					
N	N4	Copper and copper alloys	long-chipping	CuZn20 CuZn37Pb0,5	2.0250 2.0332	20	20			
N	N4	Copper and copper alloys	short-chipping	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	20	20			
N	N5	Copper special alloys	≤1400 N/mm²	Ampco		10	10			
N	N6	Plastics [Thermo-plastics, Duroplastics]	long-chipping short-chipping	PMMA, POM,PVC Pertinax						
S	S1	Titanium and Titanium alloys	≤ 1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165	3	3			
S	S2	Nickel, cobalt, iron alloys	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	2	2			
H	H1	High tensile steels, hardened steels	45 - 55 HRC							
H	H2		55 - 62 HRC							

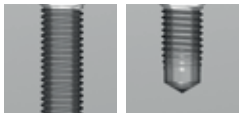


THROUGH
HOLES

Thread depth		≤3xD		
Tool material		HSS-E		
Form		B	B	B
Surface		S	S	C
Cutting direction		R	R	R
Coolant delivery		☒	☒	☒
Shank tolerance		h9	h9	h9
				
Thread type	Tolerance	Article no./page		
M	6H			1914/1915 *P. 372/373*
	6HX	4218 *P. 360*	4645 *P. 362*	
	6GX	4638 *P. 361*		
	7GX	4639 *P. 361*		
	6H+0,1	4640 *P. 361*		
MF	6H			
	6HX	4219 *P. 365*		
	6GX	4641 *P. 365*		
G	- X	4220 *P. 367*		
NPT	-			
RC „BSPT“	-			
Suitable lubricant:		●/●/△	●/●/△	●/●/△

● = Neat oil
● = Soluble oil
△ = Paste
☐ = Minimal quantity lubrication (MQL)

		Group of materials	Tensile strength	Material example	Material no.	Recommended cutting speed v_c [m/min]		
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**20**	**20**	
	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	**15**	**15**	10
	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	**10**	**10**	**12**
M	M1	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	**12**	**12**	
	M2	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	**10**	**10**	
	M3	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	6	6	
K	K1	Cast Iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	20	20	
	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	20	20	
	K3	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		10	10	
N	N1	Aluminium and wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	10	10	
	N2	Al cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	20	20	
	N3	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08			
	N4	Copper and copper alloys	long-chipping	CuZn20 CuZn37Pb0,5	2.0250 2.0332	20	20	
			short-chipping	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	20	20	
	N5	Copper special alloys	≤1400 N/mm²	Ampco		10	10	
	N6	Plastics [Thermo-plastics, Duroplastics]	long-chipping short-chipping	PMMA, POM,PVC Pertinax				
S	S1	Titanium and Titanium alloys	≤ 1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165	3	3	
	S2	Nickel, cobalt, iron alloys	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	2	2	
H	H1	High tensile steels, hardened steels	45 - 55 HRC					
	H2		55 - 62 HRC					



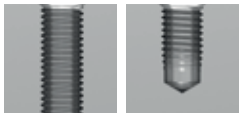
THROUGH AND
BLIND HOLES

Thread depth		≤1.5xD		
Tool material		PM HSS-E		Solid carbide
Form		C	D	D
Surface		A	C	C
Cutting direction		R	R	R
Coolant delivery		☒	☒	☒
Shank tolerance		h9	h9	h6
				

● = Neat oil
● = Soluble oil
△ = Paste
□ = Minimal quantity lubrication (MQL)

Thread type	Tolerance	Article no./page		
M	6H			2944 *P. 351*
	6HX		1201 *P. 354*	
	6GX			
	7GX			
	6H+0,1			
MF	6H			1161 *P. 352*
	6HX		4161 *P. 355*	
	6GX			
G	- X		4607 *P. 356*	4599 *P. 353*
NPT	-			
RC „BSPT“	-	4683 *P. 375*		
	Suitable lubricant:	●/●/△	●/●/△	●/●/△

		Group of materials	Tensile strength	Material example	Material no.	Recommended cutting speed v_c [m/min]		
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718			
	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	15		
	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	**12**		
M	M1	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305			
	M2	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512			
	M3	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501			
K	K1	Cast Iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	**25**	**25**	35
	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	**20**	**20**	25
	K3	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		**15**	**15**	20
N	N1	Aluminium and wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335			
	N2	Al cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	30		
	N3	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08			
	N4	Copper and copper alloys	long-chipping	CuZn20 CuZn37Pb0,5	2.0250 2.0332			
			short-chipping	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410			
	N5	Copper special alloys	≤1400 N/mm²	Ampco		2	2	
	N6	Plastics [Thermo-plastics, Duroplastics]	long-chipping short-chipping	PMMA, POM,PVC Pertinax				
S	S1	Titanium and Titanium alloys	≤ 1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165			
	S2	Nickel, cobalt, iron alloys	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634			
H	H1	High tensile steels, hardened steels	45 - 55 HRC				**3**	
	H2		55 - 62 HRC					2



THROUGH AND
BLIND HOLES

Thread depth	≤3xD
Tool material	PM HSS-E
Form	C
Surface	C
Cutting direction	R
Coolant delivery	☒
Shank tolerance	h6



● = Neat oil
● = Soluble oil
△ = Paste
□ = Minimal quantity lubrication (MQL)

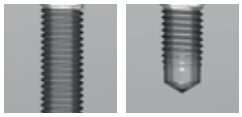
Thread type	Tolerance	Article no./page
M	6H	
	6HX	4487 *P. 376*
	6GX	4488 *P. 376*
	7GX	
	6H+0,1	
MF	6H	
	6HX	4489 *P. 377*
	6GX	4490 *P. 377*
G	- X	4493 *P. 378*
NPT	-	
RC „BSPT“	-	
Suitable lubricant:		●/●/△

		Group of materials	Tensile strength	Material example	Material no.	Recommended cutting speed v_c [m/min]
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	25
	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	25
	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	15
M	M1	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	10
	M2	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	8
	M3	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	6
K	K1	Cast Iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	
	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	30
	K3	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		25
N	N1	Aluminium and wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	15
	N2	Al cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	30
	N3	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	
	N4	Copper and copper alloys	long-chipping	CuZn20 CuZn37Pb0,5	2.0250 2.0332	30
			short-chipping	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	
	N5	Copper special alloys	≤1400 N/mm²	Ampco		
	N6	Plastics [Thermo-plastics, Duroplastics]	long-chipping short-chipping	PMMA, POM,PVC Pertinax		
S	S1	Titanium and Titanium alloys	≤ 1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165	8
	S2	Nickel, cobalt, iron alloys	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	8
H	H1	High tensile steels, hardened steels	45 - 55 HRC			
	H2		55 - 62 HRC			

General recommendations:
1.) From 2.5xD [thread depth], the thread Ø should be programmed in 2 passes. [2/31/3 in opposite direction]
2.) In general, for stainless steel and hard machining from > HRC40, it is recommended that we program the thread Ø in 2 passes. [2/31/3 in opposite direction]

optimal suitability ●●
suited ●
not suitable ○

		Group of materials	Tensile strength	Material example	Material no.	Cutting speed
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	90
	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	80
	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	70
M	M1	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	55
	M2	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	50
	M3	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	45
K	K1	Cast Iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	120
	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	100
	K3	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		80
N	N1	Aluminium and wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	250
	N2	Al cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	230
	N3	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	180
	N4	Copper and copper alloys	long-chipping	CuZn20 CuZn37Pb0,5	2.0250 2.0332	130
			short-chipping	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	130
	N5	Copper special alloys	≤1400 N/mm²	Ampco		160
	N6	Plastics [Thermoplastics, Duroplastics]	long-chipping short-chipping	PMMA, POM,PVC Pertinax		300
S	S1	Titanium and Titanium alloys	≤ 1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165	40
	S2	Nickel, cobalt, iron alloys	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	30
H	H1	High tensile steels, hardened steels	45 - 55 HRC	Hardox		45
	H2		55 - 62 HRC	PM30		40



THROUGH AND
BLIND HOLES

Thread depth	≤2xD	universal	≤3xD	
Tool material	Solid carbide			
Type	TM SP	TMU SP	MTM3SP	MTMH3SP
Surface	C	C	C	X
Coolant delivery	axial	axial	☒	☒
Shank form	HB	HB	HA	HA
Spiral	27°	15°	15°	15°
Cutting direction	right-hand	right-hand	right-hand	right-hand
				

● = Neat oil
◍ = Soluble oil
△ = Paste
☐ = Minimal quantity lubrication (MQL)

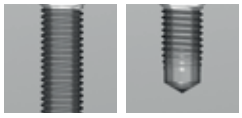
Thread type	Article no./page			
M	3743 *P. 343*	3556 *P. 346*	4226 *P. 340*	4227 *P. 339*
MF	3743 *P. 343*	3556 *P. 346*		
G (BSP)	3748 *P. 344*	3557 *P. 347*	4228 *P. 341*	
Rp (BSPP)	3748 *P. 344*	3557 *P. 347*	4228 *P. 341*	
NPT	3754 *P. 345*	3769 *P. 348*		
Rc (BSPT)		4770 *P. 349*		
Suitable lubricant:	◍/●	◍/●	◍/●	○/☐

Milling part diameter [d_1] / Feed per tooth [f_z] [Reverse rotation]

Ø1 mm	Ø2 mm	Ø3 mm	Ø4 mm	Ø5 mm	Ø6 mm	Ø7 mm	Ø8 mm	Ø9 mm	Ø10 mm	Ø12 mm	Ø14 mm	Ø16 mm	Ø18 mm	Ø20 mm	Tool suitability			
0.01	0.02	0.02	0.025	0.03	0.035	0.045	0.05	0.055	0.06	0.06	0.065	0.065	0.07	0.08	●●	●●	●●	○
0.01	0.02	0.02	0.025	0.03	0.035	0.045	0.05	0.055	0.06	0.06	0.065	0.065	0.07	0.08	●●	●●	●●	○
0.01	0.02	0.02	0.025	0.03	0.035	0.045	0.05	0.055	0.06	0.06	0.065	0.065	0.07	0.08	●	●●	●●	●
0.01	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.05	0.055	0.06	0.065	0.065	0.07	0.075	●	●●	●●	○
0.01	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.05	0.055	0.06	0.065	0.065	0.07	0.075	●	●●	●●	○
0.01	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.05	0.055	0.06	0.065	0.065	0.07	0.075	●	●●	●●	○
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06	0.065	0.07	0.08	0.09	0.1	0.12	●●	●●	●●	○
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06	0.065	0.07	0.08	0.09	0.1	0.12	●●	●●	●●	○
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.06	0.065	0.07	0.08	0.09	0.1	0.12	●●	●●	●●	●
0.02	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.08	0.085	0.09	0.1	0.12	●●	●●	●●	○
0.02	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.08	0.085	0.09	0.1	0.12	●●	●●	●●	○
0.02	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.08	0.085	0.09	0.1	0.12	●●	●●	●●	○
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	0.08	0.09	●●	●●	●●	○
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	0.08	0.09	●●	●●	●●	○
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.06	0.065	0.07	0.075	0.08	●●	●●	●●	○
0.02	0.03	0.04	0.045	0.05	0.055	0.06	0.07	0.08	0.09	0.09	0.1	0.12	0.13	0.15	●●	●●	●●	○
0.01	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.04	0.045	0.05	0.055	0.06	0.065	0.07	●●	●●	●●	○
0.01	0.01	0.015	0.02	0.025	0.03	0.035	0.04	0.04	0.045	0.05	0.055	0.06	0.065	0.07	●●	●●	●●	●●
x	0.01	0.015	0.02	0.025	0.03	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	●	●	●●	●●
x	0.01	0.015	0.02	0.025	0.03	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	○	○	○	●●

optimal suitability ●●
suited ●
not suitable ○

		Group of materials	Tensile strength	Material example	Material no.	Cutting speed
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	90
	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	80
	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	70
M	M1	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	55
	M2	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	50
	M3	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	45
K	K1	Cast Iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	120
	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	100
	K3	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		80
N	N1	Aluminium and wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	250
	N2	Al cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	230
	N3	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	180
	N4	Copper and copper alloys	long-chipping	CuZn20 CuZn37Pb0,5	2.0250 2.0332	130
			short-chipping	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	130
	N5	Copper special alloys	≤1400 N/mm²	Ampco		160
	N6	Plastics [Thermoplastics, Duroplastics]	long-chipping short-chipping	PMMA, POM,PVC Pertinax		300
S	S1	Titanium and Titanium alloys	≤ 1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165	40
	S2	Nickel, cobalt, iron alloys	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	30
H	H1	High tensile steels, hardened steels	45 - 55 HRC	Hardox		45
	H2		55 - 62 HRC	PM30		40



THROUGH AND
BLIND HOLES

Thread depth	**SC-LINE**
Tool material	**Solid carbide**
Type	SC-MTM3 SP
Surface	C
Coolant delivery	axial
Shank form	HA
Spiral	15°
Rotating direction	left-hand



● = Neat oil
◍ = Soluble oil
△ = Paste
☐ = Minimal quantity lubrication (MQL)

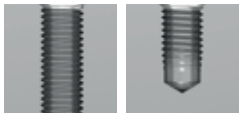
Thread type	Article no./page
M	4001 *P. 342*
MF	
G (BSP)	
Rp (BSPP)	
NPT	
Rc (BSPT)	
Suitable lubricant:	◍/●

Milling part diameter [d1] / Feed per tooth [f_z] [Climb milling process]

Ø1 mm	Ø2 mm	Ø3 mm	Ø4 mm	Ø5 mm	Ø6 mm	Ø7 mm	Ø8 mm	Ø9 mm	Ø10 mm	Ø12 mm	Ø14 mm	Ø16 mm	Tool suitability
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.008	0.015	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.055	●●
0.008	0.015	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.055	●●
0.008	0.015	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.055	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
													●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.005	0.007	0.012	0.015	0.02	0.025	0.03	0.035	0.035	0.04	0.045	0.045	0.05	●●
0.005	0.007	0.012	0.015	0.02	0.025	0.03	0.035	0.035	0.04	0.045	0.045	0.05	●●
0.005	0.008	0.01	0.012	0.015	0.02	0.025	0.025	0.03	0.03	0.035	0.04	0.045	●●
x	x	x	x	x	x	x	x	x	x	x	x	x	○

optimal suitability ●●
suited ●
not suitable ○

		Group of materials	Tensile strength	Material example	Material no.	Cutting speed
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	90
	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	80
	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	70
M	M1	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	55
	M2	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	50
	M3	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	45
K	K1	Cast Iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	120
	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	100
	K3	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		80
N	N1	Aluminium and wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	250
	N2	Al cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	230
	N3	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	180
	N4	Copper and copper alloys	long-chipping	CuZn20 CuZn37Pb0,5	2.0250 2.0332	130
			short-chipping	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	130
	N5	Copper special alloys	≤1400 N/mm²	Ampco		160
	N6	Plastics [Thermoplastics, Duroplastics]	long-chipping short-chipping	PMMA, POM,PVC Pertinax		300
S	S1	Titanium and Titanium alloys	≤ 1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.702<5 3.7115 3.7165	40
	S2	Nickel, cobalt, iron alloys	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	30
H	H1	High tensile steels, hardened steels	45 - 55 HRC	Hardox		45
	H2		55 - 66 HRC	PM30		40



THROUGH AND
BLIND HOLES

Thread depth	≤2.5xD	
Tool material	Solid carbide	Solid carbide
Type	MTMH3-Z	MTMH3SP
Surface		
Coolant delivery	with cooling grooves	
Shank form	HA	HA
Spiral	15°	15°
Rotating direction	left-hand	left-hand
		

● = Neat oil
◍ = Soluble oil
△ = Paste
☐ = Minimal quantity lubrication (MQL)

Thread type	Article no./page	
M	4002 *P. 336*	4496 *P. 338*
MF	4002 *P. 336*	
G (BSP)	4780 *P. 337*	
Rp (BSPP)	4780 *P. 337*	
NPT		
Rc (BSPT)		
Suitable lubricant:	○/◍/●/☐	○/☐

Milling part diameter [d1] / Feed per tooth [fz]											Tool suitability	
Ø1-1.8 mm	mm	Ø1.81-2.4 mm	Ø2.41-2.7 mm	Ø2.71-3.1 mm	Ø3.11-3.8 mm	Ø3.81-4.6 mm	Ø4.61-6.2 mm	Ø6.21-7.5 mm	Ø7.51-9.0 mm	Ø9.01-16 mm		
0.008	0.008	0.012	0.014	0.018	0.026	0.028	0.030	0.035	0.040	0.048	●●	○
0.008	0.008	0.012	0.014	0.018	0.026	0.028	0.030	0.035	0.040	0.048	●●	○
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●	●
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●	○
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●	○
0.005	0.005	0.007	0.008	0.010	0.014	0.016	0.018	0.020	0.026	0.033	●●	○
0.008	0.008	0.012	0.014	0.016	0.020	0.024	0.030	0.036	0.040	0.048	●●	○
0.008	0.008	0.012	0.014	0.016	0.020	0.024	0.030	0.036	0.040	0.048	●●	○
0.007	0.007	0.011	0.013	0.015	0.018	0.022	0.028	0.033	0.038	0.046	●●	●
x	x	x	x	x	x	x	x	x	x	x	●	○
0.007	0.007	0.011	0.013	0.015	0.018	0.022	0.028	0.033	0.038	0.046	●	○
x	x	x	x	x	x	x	x	x	x	x	●	○
0.008	0.008	0.012	0.014	0.016	0.020	0.024	0.030	0.036	0.040	0.048	●●	○
0.008	0.008	0.012	0.014	0.016	0.020	0.024	0.030	0.036	0.040	0.048	●●	○
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.048	●●	○
x	x	x	x	x	x	x	x	x	x	x	○	○
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●	○
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●	●●
0.007	0.007	0.010	0.011	0.012	0.016	0.020	0.025	0.030	0.036	0.044	●●	●●
0.005	0.005	0.008	0.009	0.010	0.014	0.018	0.022	0.028	0.033	0.042	●●	●●

P	M	K	N	S	H	Tool illustration	Standard	Hardness	Type	Form	Tolerance on Ø	Tool material	Surface	d1/mm	Article no.	Page
Micro thread milling cutters																
•	•	•	•	•	•		WN	66 HRC	MTMH3-Z			VHM		M 2 - M20	4002	336
•	•	•	•	•	•		WN	66 HRC	MTMH3-Z			VHM			4780	337
○				•	•		WN	66 HRC	MTMH3 SP			VHM	X	M 2 - M16	4496	338
				○	•		WN	66 HRC	MTMH3 SP			VHM	X	M 2 - M16	4227	339
•	•	•	•	•	○		WN	55 HRC	MTM3 SP			VHM	C	M1,6 - M20	4226	340
•	•	•	•	•	○		WN	55 HRC	MTM3 SP			VHM	C		4228	341
•	•	•	•	•	○		WN	55 HRC	SC MTM3 SP			VHM	C	M1,6 - M20	4001	342
Thread milling cutters without chamfer for ISO metric threads																
•	○	•	•	○	○		WN	55 HRC	TM SP			VHM	C	M4 - M20 x 1,5	3743	343
Thread milling cutters without chamfer for BSP threads																
•	○	•	•	○	○		WN	55 HRC	TM SP			VHM	C	G1/8 - G3/8	3748	344
Thread milling cutters without chamfer for NPT threads																
•	•	•	•	•	○		WN	55 HRC	TM SP			VHM	C	1/16 - 3/8	3754	345
Universal thread milling cutters for ISO metric threads																
•	•	•	•	•	○		WN	55 HRC	TMU SP			VHM	C	> 10 - > 30	3556	346
Universal thread milling cutters for BSP threads																
•	•	•	•	•	○		WN	55 HRC	TMU SP			VHM	C	≥ 1/4 - ≥ 1	3557	347
Universal thread milling cutters for NPT threads																
•	•	•	•	•	○		WN	55 HRC	TMU SP			VHM	C	≥ 1 - ≥ 1/2	3769	348
Universal thread milling cutters for Rc threads																
•	•	•	•	•	○		WN	55 HRC	TMU SP			VHM	C	Rc1/8 - Rc 1-Rc 2	4770	349
Taps for ISO metric threads																
					•		~DIN 371	62 HRC	H	D	ISO2/6H	VHM	C	M3 - M16	2944	351
Taps for ISO metric fine threads																
					•		~DIN 371	62 HRC	H	D	ISO2/6H	VHM	C	M6 x 0,5 - M16 x 1,5	1161	352
Taps for BSP threads																
					•		~DIN 371	62 HRC	H	D		VHM	C	G1/8 - G1/2	4599	353

P	M	K	N	S	H	Tool illustration	Standard	Hardness	Type	Form	Tolerance on Ø	Tool material	Surface	d1/mm	Article no.	Page
Taps for ISO metric threads																
					○		DIN 371	55 HRC	H	D	6HX	HSS-E-PM	C	M3 - M16	1201	354
Taps for ISO metric fine threads																
					○		~DIN 371	55 HRC	H	D	6HX	HSS-E-PM	C	M6 x 0,75 - M16 x 1,5	4161	355
Taps for BSP threads																
					○		DIN 371	55 HRC	H	D		HSS-E-PM	C	G1/8 - G1/2	4607	356
Taps for ISO metric threads																
●	●	○	○	○			DIN 371/376		VA R45	C	6HX	HSS-E	A	M 2 - M42	393	357
●	●	○	○	○			DIN 371/376		VA R45	C	6GX	HSS-E	A	M 2 - M30	4625	358
●	●	○	○	○			DIN 371/376		VA R45	C	7GX	HSS-E	A	M 2 - M30	4626	358
●	●	○	○	○			DIN 371/376		VA R45	C	6H +0,1	HSS-E	A	M 2 - M30	4627	358
●	●	○	○	○			WN		VA R45	C	6HX	HSS-E	A	M3 - M20	4633	359
●	●	○	○	○			DIN 371/376		VA	B	6HX	HSS-E	S	M 2 - M42	4218	360
●	●	○	○	○			DIN 371/376		VA	B	6GX	HSS-E	S	M 2 - M30	4638	361
●	●	○	○	○			DIN 371/376		VA	B	7GX	HSS-E	S	M 2 - M30	4639	361
●	●	○	○	○			DIN 371/376		VA	B	6H +0,1	HSS-E	S	M 2 - M30	4640	361
●	●	○	○	○			WN		VA	B	6HX	HSS-E	S	M3 - M20	4645	362
Taps for ISO metric fine threads																
●	●	○	○	○			DIN 374		VA R45	C	6HX	HSS-E	A	M3 x 0,35 - M24 x 2	394	364
●	●	○	○	○			DIN 374		VA R45	C	6GX	HSS-E	A	M3 x 0,35 - M24 x 2	4628	364
●	●	○	○	○			DIN 374		VA	B	6HX	HSS-E	S	M3 x 0,35 - M24 x 2	4219	365
●	●	○	○	○			DIN 374		VA	B	6GX	HSS-E	S	M3 x 0,35 - M24 x 2	4641	365
Taps for BSP threads																
●	●	○	○	○			DIN 5156		VA R45	C		HSS-E	A	G1/16 - G1	395	366
●	●	○	○	○			DIN 5156		VA	B		HSS-E	S	G1/16 - G1	4220	367
Taps for ISO metric threads																
≤ 1200							DIN 371		H R40	C	ISO2/6H	HSS-E	C	M 2 - M10	1916	368

P	M	K	N	S	H	Tool illustration	Standard	Hardness	Type	Form	Tolerance on Ø	Tool material	Surface	d1/mm	Article no.	Page
Taps for ISO metric threads																
≤ 1200							DIN 376		HR40	C	ISO2/6H	HSS-E	C	M3 - M30	1917	369
≤ 1200							DIN 371		HR15	C	ISO2/6H	HSS-E-PM	A	M3 - M10	1577	370
≤ 1200							DIN 376		HR15	C	ISO2/6H	HSS-E-PM	A	M12 - M20	1578	371
≤ 1200							DIN 371		H	B	ISO2/6H	HSS-E	C	M2,2 - M10	1914	372
≤ 1200							DIN 376		H	B	ISO2/6H	HSS-E	C	M3 - M24	1915	373
Taps for NPT threads																
≤ 1000	●	○	○				WN		N	C		HSS-E	S	1/16 - 1	1088	374
Taps for Rc (BSPT) threads																
≤ 1200		●	≥ 7				DIN 5156		H	C		HSS-E-PM	A	Rc1/8 - Rc1	4683	375
Fluteless taps for ISO metric threads																
●	●	●	○	●			~DIN 371/376		N	C	4HX/6HX	HSS-E-PM	C	M1 - M20	4487	376
●	●	●	○	●			~DIN 371/376		N	C	6GX	HSS-E-PM	C	M1 - M20	4488	376
Fluteless taps for ISO metric fine threads																
●	●	●	○	●			~DIN 374		N	C	6HX	HSS-E-PM	C	M3 x 0,35 - M24 x 2	4489	377
●	●	●	○	●			~DIN 374		N	C	6GX	HSS-E-PM	C	M3 x 0,35 - M24 x 2	4490	377
Fluteless taps for BSP threads																
●	●	●	○	●			DIN 2189		N	C		HSS-E-PM	C	G1/8 - G1/2	4493	378

MTMH3-Z

helical drill thread milling into solid material up to 66 HRC

+ guaranteed process reliability and threads with gauges
+ core hole and thread in a single step: significantly shorter cycle and setting time
+ universally usable in unhardened and hardened materials up to 66 HRC



Micro thread milling cutters

2,5xD | 66 HRC

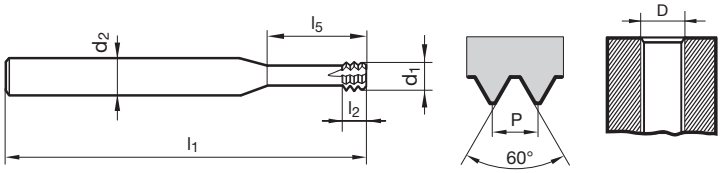
Tool material	**Solid carbide**
Surface	
Type	MTMH3-Z
Internal cooling	
Shank form	~HB

NEW

P	•
M	•
K	•
N	•
S	•
H	•

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

- with cooling grooves
- rotating direction left-hand





Article no. **4002**

D	P	d1	d2	l1	l2	l5	Z	Order no.
	mm	mm	mm	mm	mm	mm		
M2	0.400	1.40	3.00	39.00	1.20	5.00	4	4002 2.000
M2,5	0.450	1.80	3.00	39.00	1.30	6.50	4	4002 2.500
M3	0.500	2.40	6.00	58.00	1.50	7.50	4	4002 3.000
M3,5	0.600	2.70	6.00	58.00	1.80	9.00	4	4002 3.500
M4	0.700	3.10	6.00	58.00	2.10	10.00	4	4002 4.000
M5	0.800	3.80	6.00	58.00	2.40	12.50	4	4002 5.000
M6	1.000	4.60	8.00	64.00	3.00	15.00	4	4002 6.000
M5x0,5/M6x0,5	0.500	3.80	6.00	58.00	1.50	15.00	4	4002 6.003
M8	1.250	6.20	8.00	64.00	3.60	20.00	4	4002 8.000
M6x0,75/M8x0,75	0.750	4.60	8.00	64.00	2.30	20.00	4	4002 8.004
M10	1.500	7.50	10.00	73.00	4.50	25.00	4	4002 10.000
M12	1.750	9.00	10.00	73.00	5.20	30.00	4	4002 12.000
M10x1/M12x1	1.000	7.50	8.00	64.00	3.00	25.00	4	4002 12.005
M16	2.000	11.50	12.00	90.00	6.00	40.00	4	4002 16.000
M14x1,5/M16x1,5	1.500	11.50	12.00	90.00	4.50	40.00	4	4002 16.007
M20	2.500	14.50	16.00	105.00	7.50	50.00	4	4002 20.000

Micro thread milling cutters

2,5xD | 66 HRC

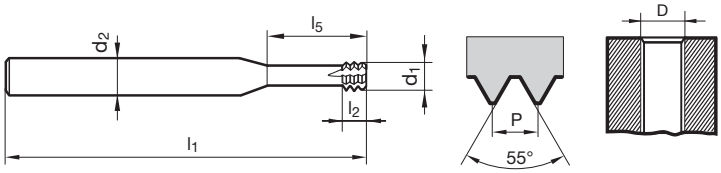
P	•
M	•
K	•
N	•
S	•
H	•

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

- with cooling grooves
- rotating direction left-hand

Tool material	**Solid carbide**
Surface	
Type	MTMH3-Z
Internal cooling	
Shank form	~HB

NEW





Article no.	**4780**

D	P	d1	d2	l1	l2	l5	Z	Order no.
	G/inch	mm	mm	mm	mm	mm		
G1/16-G1/8	28	6.10	8.00	64.00	2.70	24.00	4	4780 9.728
G1/4-G3/8	19	10.30	12.00	90.00	4.00	40.00	4	4780 16.662
G1/2-G5/8-G3/4	14	15.70	16.00	105.00	5.40	50.00	4	4780 26.441

Micro thread milling cutters

2,5xD | 66 HRC

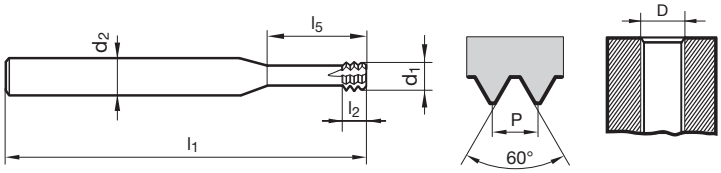
Tool material	**Solid carbide**
Surface	X
Type	MTMH3 SP
Internal cooling	
Shank form	~HA

NEW

P	○
M	
K	
N	
S	•
H	•

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

- suitable for hardened steels up to HRC 66
- M4 counter clockwise





Article no. **4496**

D	P	d1	d2	l1	l2	l5	Z	Order no.
	mm	mm	mm	mm	mm	mm		
M2	0.400	1.55	3.00	39.00	1.20	5.00	4	4496 2.000
M2,5	0.450	1.95	3.00	39.00	1.40	6.50	4	4496 2.500
M3	0.500	2.35	6.00	58.00	1.50	7.50	4	4496 3.000
M3,5	0.600	2.80	6.00	58.00	1.80	9.00	4	4496 3.500
M4	0.700	3.10	6.00	58.00	2.10	10.00	4	4496 4.000
M5	0.800	3.80	6.00	58.00	2.40	12.50	4	4496 5.000
M6	1.000	4.80	6.00	58.00	3.00	15.00	4	4496 6.000
M8	1.250	5.95	6.00	58.00	3.80	20.00	5	4496 8.000
M10	1.500	7.80	8.00	64.00	4.50	25.00	5	4496 10.000
M12	1.750	9.00	10.00	73.00	5.30	30.00	6	4496 12.000
M16	2.000	11.80	12.00	84.00	6.00	35.00	6	4496 16.000

Micro thread milling cutters

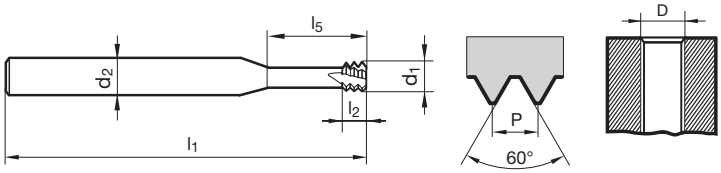
3xD | 66 HRC

Tool material	**Solid carbide**
Surface	X
Type	MTMH3 SP
Internal cooling	
Shank form	HA

P	
M	
K	
N	
S	○
H	•

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• for hard machining 45-65 HRC





Company std. Article no. **4227**

D	P	d1	d2	l1	l2	l5	Z	Order no.
	mm	mm	mm	mm	mm	mm		
M2	0.400	1.55	3.00	39.00	1.20	6.00	4	4227 2.000
M2,5	0.450	1.95	3.00	39.00	1.40	7.50	4	4227 2.500
M3	0.500	2.35	6.00	58.00	1.50	9.50	4	4227 3.000
M4	0.700	3.10	6.00	58.00	2.10	12.50	4	4227 4.000
M5	0.800	3.80	6.00	58.00	2.40	16.00	4	4227 5.000
M6	1.000	4.80	6.00	58.00	3.00	20.00	4	4227 6.000
M8	1.250	5.95	6.00	58.00	3.80	24.00	4	4227 8.000
M10	1.500	7.80	8.00	64.00	4.50	23.00	4	4227 10.000
M12	1.750	9.00	10.00	73.00	5.30	26.00	5	4227 12.000
M16	2.000	11.80	12.00	90.00	6.00	40.00	5	4227 16.000

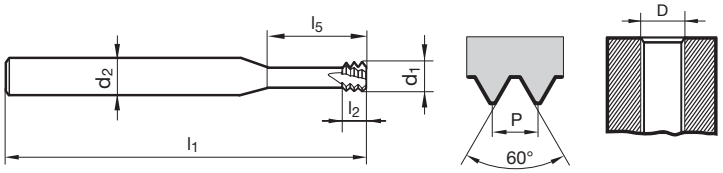
Micro thread milling cutters

3xD | 55 HRC

P	•
M	•
K	•
N	•
S	•
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	**Solid carbide**
Surface	C
Type	MTM3 SP
Internal cooling	
Shank form	HA





Company std. Article no. **4226**

D	P	d1	d2	l1	l2	l5	Z	Order no.
	mm	mm	mm	mm	mm	mm		
M1,6	0.350	1.20	3.00	39.00	1.10	4.80	3	4226 1.600
M1,8	0.350	1.40	3.00	39.00	1.10	5.40	3	4226 1.800
M2	0.400	1.55	3.00	39.00	1.20	6.00	4	4226 2.000
M2,5	0.450	1.95	3.00	39.00	1.40	7.50	4	4226 2.500
M3	0.500	2.40	6.00	58.00	1.50	9.50	4	4226 3.000
M3,5	0.600	2.80	6.00	58.00	1.80	11.00	4	4226 3.500
M4	0.700	3.20	6.00	58.00	2.10	12.50	4	4226 4.000
M5	0.800	4.00	6.00	58.00	2.40	16.00	4	4226 5.000
M6	1.000	4.80	6.00	58.00	3.00	20.00	4	4226 6.000
M8	1.250	5.95	6.00	58.00	3.80	24.00	4	4226 8.000
M10	1.500	7.80	8.00	73.00	4.50	33.00	4	4226 10.000
M12	1.750	9.00	10.00	84.00	5.30	38.00	4	4226 12.000
M16	2.000	11.80	12.00	84.00	6.00	35.00	5	4226 16.000
M20	2.500	15.00	16.00	109.00	7.50	56.00	5	4226 20.000

Micro thread milling cutters

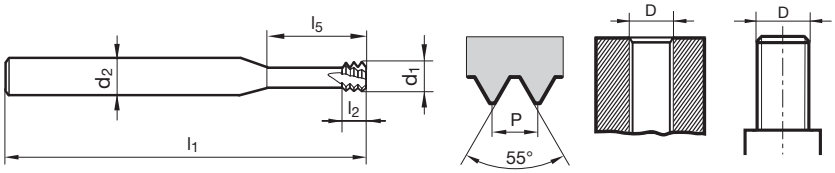
3xD | 55 HRC

P	•
M	•
K	•
N	•
S	•
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• thread milling cutters for internal and external threads

Tool material	**Solid carbide**
Surface	C
Type	MTM3 SP
Internal cooling	
Shank form	HA





Company std. Article no. **4228**

D	P	d1	d2	l1	l2	l5	Z	**Order no.**
	mm	mm	mm	mm	mm	mm		
G1/16-G1/8	0.907	6.20	8.00	64.00	2.70	19.50	4	4228 9.728
G1/4-G3/8	1.337	9.95	10.00	73.00	4.00	25.00	4	4228 16.662
G1/2-G7/8	1.814	11.95	12.00	84.00	5.40	37.00	4	4228 30.201
G1-G2	2.309	15.95	16.00	105.00	6.90	44.00	5	4228 59.614

Micro thread milling cutters

2,5xD | 55 HRC

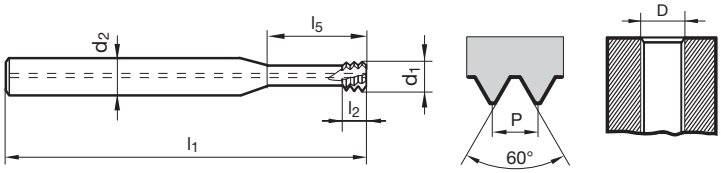
P	•
M	•
K	•
N	•
S	•
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

- M1.6 - M3 with 2 cooling grooves
- with internal cooling ≥ M3.5
- M4 counter clockwise

Tool material	**Solid carbide**
Surface	C
Type	SC-MTM3-SP
Internal cooling	
Shank form	~HA

NEW





Article no. **4001**

D	P	d1	d2	l1	l2	l5	Z	Order no.
	mm	mm	mm	mm	mm	mm		
M1,6	0.350	1.20	3.00	39.00	1.10	4.00	3	4001 1.600
M1,8	0.350	1.40	3.00	39.00	1.10	4.50	4	4001 1.800
M2	0.400	1.55	3.00	39.00	1.20	5.00	4	4001 2.000
M2,5	0.450	1.95	3.00	39.00	1.40	6.50	4	4001 2.500
M3	0.500	2.40	3.00	39.00	1.50	8.00	5	4001 3.000
M3,5	0.600	2.80	6.00	58.00	1.80	9.00	5	4001 3.500
M4	0.700	3.20	6.00	58.00	2.10	11.00	5	4001 4.000
M5	0.800	4.00	6.00	58.00	2.40	13.50	6	4001 5.000
M6	1.000	4.80	6.00	58.00	3.00	16.00	6	4001 6.000
M8	1.250	5.95	6.00	58.00	3.80	21.00	7	4001 8.000
M10	1.500	7.80	8.00	73.00	4.50	26.00	7	4001 10.000
M12	1.750	9.00	10.00	84.00	5.30	31.00	7	4001 12.000
M16	2.000	11.80	12.00	90.00	6.00	41.00	8	4001 16.000
M20	2.500	15.00	16.00	105.00	7.50	51.00	8	4001 20.000

Thread milling cutters without chamfer for ISO metric threads

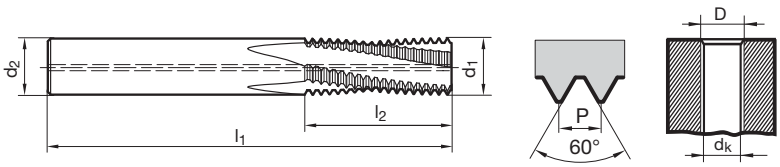
2xD | 55 HRC

Tool material	Solid carbide
Surface	C
Type	TM SP
Internal cooling	
Shank form	HB

P	•
M	○
K	•
N	•
S	○
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• without chamfer





Company std. Article no. **3743**

D	P	d1	d2	dk	l1	l2	Z	Order no.
	mm	mm	mm	mm	mm	mm		
M4	0.700	3.00	6.00	3.30	48.00	8.80	3	3743 4.000
M5	0.800	4.00	6.00	4.20	54.00	10.80	3	3743 5.000
M6	1.000	4.80	6.00	5.00	54.00	13.50	3	3743 6.000
M8	1.250	6.40	8.00	6.80	62.00	18.10	3	3743 8.000
M8 x 1	1.000	6.40	8.00	7.00	62.00	17.50	3	3743 8.005
M10	1.500	7.95	10.00	8.50	74.00	21.80	3	3743 10.000
M10 x 1	1.000	7.95	10.00	9.00	74.00	21.50	3	3743 10.005
M10 x 1,25	1.250	7.95	10.00	8.80	74.00	21.90	3	3743 10.006
M12	1.750	9.95	10.00	10.20	74.00	25.40	4	3743 12.000
M12 x 1,5	1.500	9.95	10.00	10.50	74.00	26.30	4	3743 12.007
M14	2.000	11.20	12.00	12.00	90.00	31.00	4	3743 14.000
M14 x 1,5	1.500	11.20	12.00	12.50	90.00	30.80	4	3743 14.007
M16	2.000	12.80	14.00	14.00	90.00	35.00	4	3743 16.000
M16 x 1,5	1.500	12.80	14.00	14.50	90.00	33.80	4	3743 16.007
M20	2.500	14.95	16.00	17.50	102.00	41.30	4	3743 20.000
M20 x 1,5	1.500	14.95	16.00	18.50	102.00	42.80	4	3743 20.007

Thread milling cutters without chamfer for BSP threads

2xD | 55 HRC

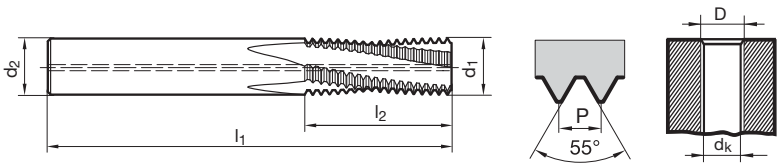
Tool material	**Solid carbide**
Surface	C
Type	TM SP
Internal cooling	
Shank form	HB

NEW

P	•
M	○
K	•
N	•
S	○
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• without chamfer





Company std. Article no. **3748**

D	P	d1	d2	dk	l1	l2	Z	**Order no.**
	G/inch	mm	mm	mm	mm	mm		
G1/8	28	7.95	8.00	8.80	64.00	21.30	3	3748 9.728
G1/4	19	10.50	12.00	11.80	90.00	28.70	4	3748 13.157
G3/8	19	13.60	14.00	15.25	90.00	35.40	4	3748 16.662

Thread milling cutters without chamfer for NPT threads

2xD | 55 HRC

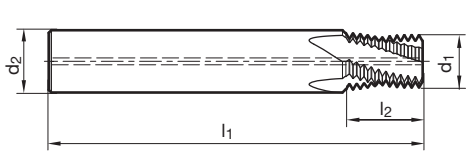
Tool material	**Solid carbide**
Surface	C
Type	TM SP
Internal cooling	
Shank form	HB

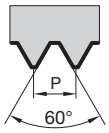
NEW

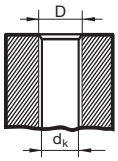
P	•
M	•
K	•
N	•
S	•
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• without chamfer









Company std. Article no. **3754**

D	P	d1	d2	dk	l1	l2	Z	Order no.
	G/inch	mm	mm	mm	mm	mm		
1/16	27	5.90	8.00	6.15	54.00	9.90	3	3754 8.190
1/8	27	7.30	8.00	8.40	64.00	9.90	3	3754 10.620
1/4	18	9.95	12.00	11.10	72.00	19.00	4	3754 14.140
3/8	18	12.50	14.00	14.30	80.00	14.80	4	3754 17.570

Universal thread milling cutters for ISO metric threads

55 HRC

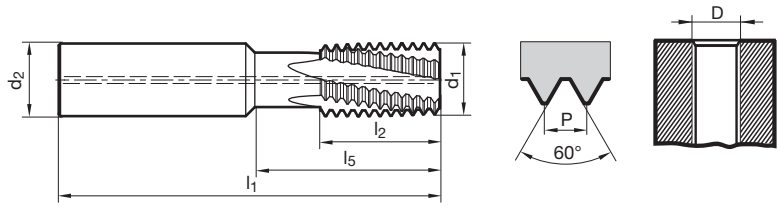
P	•
M	•
K	•
N	•
S	•
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	**Solid carbide**
Surface	C
Type	TMU SP
Internal cooling	
Shank form	HB

NEW

• universal thread milling cutters for internal threads M / MF





Company std. Article no. **3556**

P	D	d1	d2	l1	l5	l2	Z	Order no.
mm		mm	mm	mm	mm	mm		
0.500	> 10	7.95	8.00	64.00		20.00	4	3556 8.050
1.500	> 14	9.95	10.00	70.00	25.00	16.00	4	3556 10.150
1.000	> 12	9.95	10.00	70.00	25.00	16.00	4	3556 10.100
1.250	> 14	9.95	10.00	70.00	25.00	16.00	4	3556 10.125
1.250	> 16	11.95	12.00	80.00	31.00	20.00	4	3556 12.125
1.000	> 16	11.95	12.00	80.00	31.00	20.00	4	3556 12.100
1.500	> 16	11.95	12.00	80.00	31.00	20.00	4	3556 12.150
1.500	> 20	15.95	16.00	90.00	40.00	25.00	5	3556 16.150
1.000	> 18	15.95	16.00	90.00	40.00	25.00	5	3556 16.100
2.000	> 22	15.95	16.00	90.00	40.00	25.00	5	3556 16.200
3.000	> 24	17.95	18.00	102.00	50.00	33.00	5	3556 18.300
2.000	> 26	19.95	20.00	105.00	50.00	33.00	5	3556 20.200
1.000	> 24	19.95	20.00	105.00	50.00	33.00	5	3556 20.100
1.500	> 26	19.95	20.00	105.00	50.00	33.00	5	3556 20.150
2.500	> 26	19.95	20.00	105.00	50.00	33.00	5	3556 20.250
3.000	> 27	19.95	20.00	105.00	50.00	33.00	5	3556 20.300
3.500	> 30	19.95	20.00	105.00	50.00	33.00	5	3556 20.350

Universal thread milling cutters for BSP threads

55 HRC

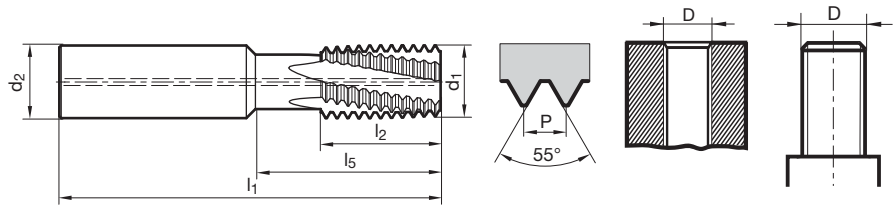
P	•
M	•
K	•
N	•
S	•
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	**Solid carbide**
Surface	C
Type	TMU SP
Internal cooling	
Shank form	HB

NEW

• universal thread milling cutters for internal and external threads





Company std. Article no. **3557**

P	D	d1	d2	l1	l5	l2	Z	**Order no.**
G/inch		mm	mm	mm	mm	mm		
19	≥ 1/4	9.95	10.00	70.00	25.00	16.00	4	3557 10.190
14	≥ 1/2	15.95	16.00	90.00	40.00	25.00	5	3557 16.140
11	≥ 1	19.95	20.00	105.00	50.00	33.00	5	3557 20.110

Universal thread milling cutters for NPT threads

55 HRC

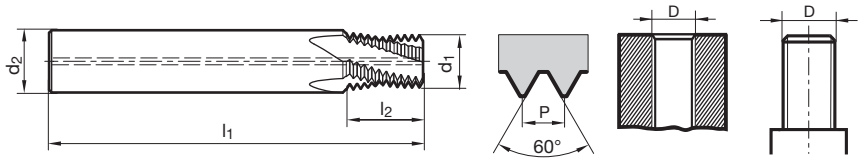
P	•
M	•
K	•
N	•
S	•
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	**Solid carbide**
Surface	C
Type	TMU SP
Internal cooling	
Shank form	HB

NEW

• universal thread milling cutters for internal and external threads





Company std. Article no. **3769**

P	D	d1	d2	l1	l2	Z	Order no.
G/inch		mm	mm	mm	mm		
11	≥ 1	18.50	20.00	90.00	23.19	5	3769 34.180
14	≥ 1/2	14.50	16.00	90.00	19.05	5	3769 21.900

Universal thread milling cutters for Rc threads

55 HRC

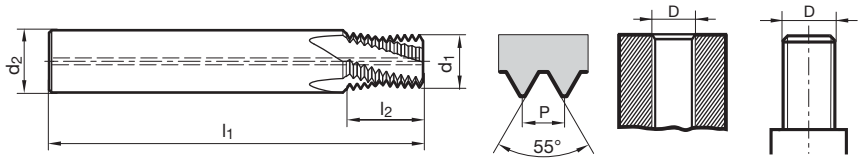
Tool material	**Solid carbide**
Surface	C
Type	TMU SP
Internal cooling	
Shank form	~HB

NEW

P	•
M	•
K	•
N	•
S	•
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• universal thread milling cutters for internal and external threads





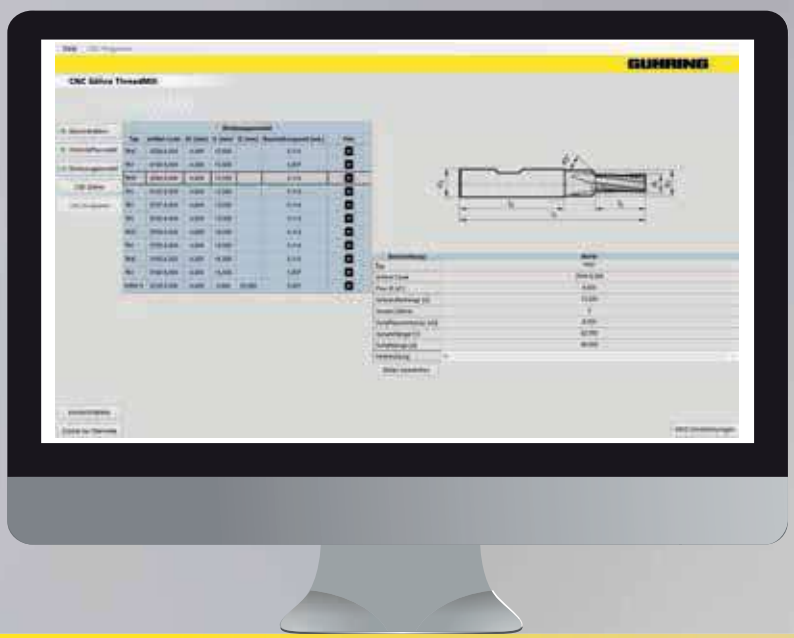
Article no. **4770**

P	D	d1	d2	l1	l2	Z	**Order no.**
G/inch		mm	mm	mm	mm		
28	Rc1/8	7.40	8.00	64.00	8.60	3	4770 9.728
19	Rc1/4-Rc3/8	9.12	10.00	74.00	14.04	4	4770 13.157
14	Rc1/2-Rc3/4	14.80	16.00	90.00	19.05	5	4770 20.955
11	Rc 1-Rc 2	18.00	20.00	105.00	33.40	5	4770 33.249

CNC Gühro ThreadMill

Free programming software

for thread milling cutters and drill thread milling cutters



In order to make the machining with Gühring thread milling cutters even more user friendly, we have developed the intuitive "CNC Gühro ThreadMill".

"CNC Gühro ThreadMill" is available free-of-charge. Simply download it from our homepage www.guehring.com!

To the optimal CNC programme in five steps

1. Specify the thread data
   Select from all current thread standards
2. Select the material
   You are always referred to the optimal parameters
3. Select the tool
   Technical data, drawing, machining time and video simplify selection
4. Record CNC data
   Enter required milling strategy and parameters
5. Receive CNC programme with code and data sheet
   Programming data (Sinumerik, Haidenhain, Fanuc, Philips, Mazatrol or Hurco) are imported and automatically recognised

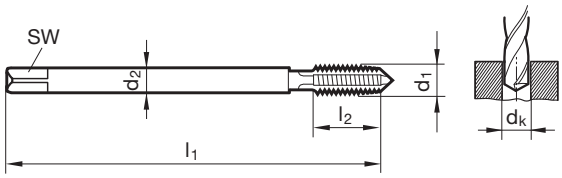
Taps for ISO metric threads

62 HRC

P	
M	
K	
N	
S	
H	•

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	**Solid carbide**
Tolerance on Ø	ISO2/6H
Surface	C
Type	H
Form	D
Internal cooling	





Company std. ~DIN 371 Article no. **2944**

d1	P	d2	SW	dk	l1	l2	**Order no.**
	mm	mm	mm	mm	mm	mm	
M3	0.500	3.50	2.70	2.60	56.00	12.00	2944 3.000
M4	0.700	4.50	3.40	3.40	63.00	14.00	2944 4.000
M5	0.800	6.00	4.90	4.30	70.00	17.00	2944 5.000
M6	1.000	6.00	4.90	5.10	80.00	20.00	2944 6.000
M8	1.250	8.00	6.20	6.90	90.00	20.00	2944 8.000
M10	1.500	10.00	8.00	8.60	100.00	24.00	2944 10.000
M12	1.750	12.00	9.00	10.40	110.00	28.00	2944 12.000
M16	2.000	16.00	12.00	14.10	110.00	40.00	2944 16.000

Taps for ISO metric fine threads

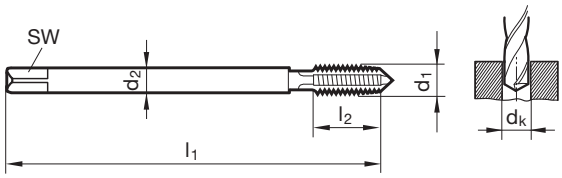
62 HRC

Tool material	Solid carbide
Tolerance on Ø	ISO2/6H
Surface	C
Type	H
Form	D
Internal cooling	

P	
M	
K	
N	
S	
H	•

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• with internal cooling ≥ M12





Company std. ~DIN 371 Article no. **1161**

d1	d2	SW	dk	l1	l2	Order no.
	mm	mm	mm	mm	mm	
M6 x 0,5	6.00	4.90	5.60	80.00	15.00	1161 6.003
M6 x 0,75	6.00	4.90	5.30	80.00	20.00	1161 6.004
M8 x 1	8.00	6.20	7.10	90.00	18.00	1161 8.005
M10 x 1	10.00	8.00	9.10	90.00	22.00	1161 10.005
M10 x 1,25	10.00	8.00	8.90	100.00	28.00	1161 10.006
M12 x 1	12.00	9.00	11.10	100.00	25.00	1161 12.005
M12 x 1,25	12.00	9.00	10.90	100.00	28.00	1161 12.006
M12 x 1,5	12.00	9.00	10.60	100.00	28.00	1161 12.007
M14 x 1,5	14.00	11.00	12.60	100.00	30.00	1161 14.007
M16 x 1,5	16.00	12.00	14.60	100.00	40.00	1161 16.007

Taps for BSP threads

62 HRC

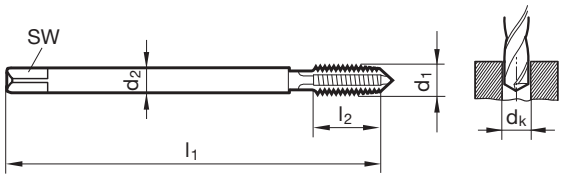
Tool material	**Solid carbide**
Tolerance on Ø	
Surface	C
Type	H
Form	D
Internal cooling	

NEW

P	
M	
K	
N	
S	
H	•

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• for hard machining 55-62 HRC





~DIN 371 Article no. **4599**

d1	P	d2	SW	dk	l1	l2	**Order no.**
	G/inch	mm	mm	mm	mm	mm	
G1/8	28	10.00	8.00	8.90	90.00	22.00	4599 9.728
G1/4	19	14.00	11.00	11.90	100.00	30.00	4599 13.157
G3/8	19	16.00	12.00	15.35	100.00	40.00	4599 16.662
G1/2	14	20.00	16.00	19.00	125.00	40.00	4599 20.955

Taps for ISO metric threads

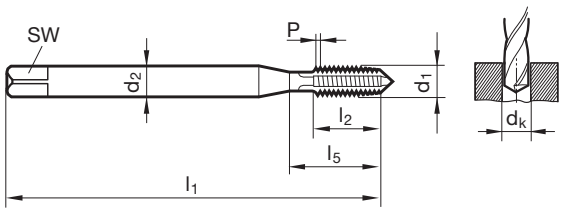
55 HRC

Tool material	HSS-E-PM
Tolerance on Ø	6HX
Surface	C
Type	H
Form	D
Internal cooling	

P	
M	
K	
N	
S	
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• for hard machining 45-55 HRC





DIN 2184-1 DIN 371 Article no. **1201**

d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M3	0.500	3.50	2.70	2.60	56.00	10.00	18.00	1201 3.000
M4	0.700	4.50	3.40	3.40	63.00	12.00	21.00	1201 4.000
M5	0.800	6.00	4.90	4.30	70.00	14.00	25.00	1201 5.000
M6	1.000	6.00	4.90	5.10	80.00	16.00	30.00	1201 6.000
M8	1.250	8.00	6.20	6.90	90.00	17.00	35.00	1201 8.000
M10	1.500	10.00	8.00	8.60	100.00	20.00	39.00	1201 10.000
M12	1.750	12.00	9.00	10.40	110.00	24.00	49.00	1201 12.000
M14	2.000	14.00	11.00	12.10	110.00	26.00	53.00	1201 14.000
M16	2.000	16.00	12.00	14.10	110.00	26.00	54.00	1201 16.000

Taps for ISO metric fine threads

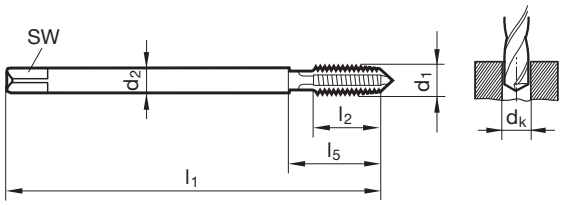
55 HRC

Tool material	HSS-E-PM
Tolerance on Ø	6HX
Surface	C
Type	H
Form	D
Internal cooling	

P	
M	
K	
N	
S	
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• for hard machining 45-55 HRC





DIN 2184-1 ~DIN 371 Article no. **4161**

d1	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	6.00	4.90	5.30	80.00	13.00	30.00	4161 6.004
M8 x 1	8.00	6.20	7.10	90.00	17.00	35.00	4161 8.005
M10 x 1	10.00	8.00	9.10	90.00	16.00	35.00	4161 10.005
M10 x 1,25	10.00	8.00	8.90	100.00	20.00	39.00	4161 10.006
M12 x 1	12.00	9.00	11.10	100.00	20.00	40.00	4161 12.005
M12 x 1,25	12.00	9.00	10.90	100.00	20.00	40.00	4161 12.006
M12 x 1,5	12.00	9.00	10.60	100.00	20.00	40.00	4161 12.007
M14 x 1,5	14.00	11.00	12.60	100.00	20.00	40.00	4161 14.007
M16 x 1,5	16.00	12.00	14.60	100.00	22.00	44.00	4161 16.007

Taps for BSP threads

55 HRC

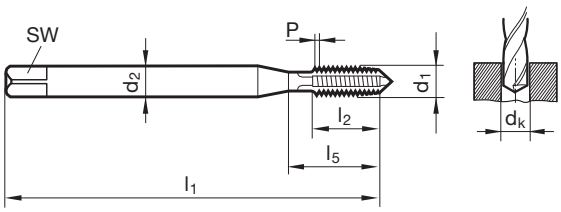
Tool material	HSS-E-PM
Tolerance on Ø	
Surface	C
Type	H
Form	D
Internal cooling	

NEW

P	
M	
K	
N	
S	
H	○

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• for hard machining 45-55 HRC





DIN 2184-1 DIN 371 Article no. **4607**

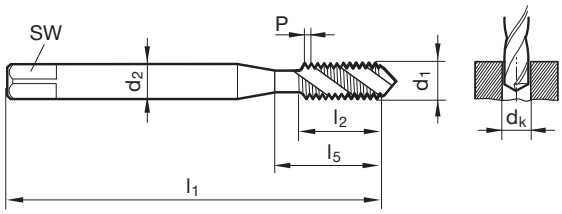
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/8	28	10.00	8.00	8.90	100.00	19.00	39.00	4607 9.728
G1/4	19	14.00	11.00	11.90	110.00	28.00	49.00	4607 13.157
G3/8	19	16.00	12.00	15.35	125.00	28.00	54.00	4607 16.662
G1/2	14	20.00	16.00	19.00	140.00	35.00	62.00	4607 20.955

Taps for ISO metric threads

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	HSS-E
Tolerance on Ø	6HX
Surface	A
Type	VA R45
Form	C
Internal cooling	





DIN 2184-1 DIN 371/DIN 376 Article no. **393**

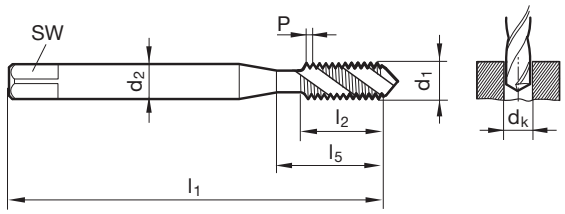
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M2	0.400	2.80	2.10	1.60	45.00	4.50	13.50	393 2.000
M2,5	0.450	2.80	2.10	2.05	50.00	5.00	14.50	393 2.500
M3	0.500	3.50	2.70	2.50	56.00	6.00	18.00	393 3.000
M3,5	0.600	4.00	3.00	2.90	56.00	7.00	20.00	393 3.500
M4	0.700	4.50	3.40	3.30	63.00	7.50	21.00	393 4.000
M4,5	0.750	6.00	4.90	3.70	70.00	8.50	25.00	393 4.500
M5	0.800	6.00	4.90	4.20	70.00	8.50	25.00	393 5.000
M6	1.000	6.00	4.90	5.00	80.00	11.00	30.00	393 6.000
M7	1.000	7.00	5.50	6.00	80.00	11.00	30.00	393 7.000
M8	1.250	8.00	6.20	6.80	90.00	14.00	35.00	393 8.000
M9	1.250	9.00	7.00	7.80	90.00	14.00	35.00	393 9.000
M10	1.500	10.00	8.00	8.50	100.00	16.00	39.00	393 10.000
M11	1.500	8.00	6.20	9.50	100.00	16.00	42.00	393 11.000
M12	1.750	9.00	7.00	10.20	110.00	18.50	49.00	393 12.000
M14	2.000	11.00	9.00	12.00	110.00	20.00	53.00	393 14.000
M16	2.000	12.00	9.00	14.00	110.00	20.00	54.00	393 16.000
M18	2.500	14.00	11.00	15.50	125.00	25.00	62.00	393 18.000
M20	2.500	16.00	12.00	17.50	140.00	25.00	62.00	393 20.000
M22	2.500	18.00	14.50	19.50	140.00	27.00	62.00	393 22.000
M24	3.000	18.00	14.50	21.00	160.00	30.00	73.00	393 24.000
M27	3.000	20.00	16.00	24.00	160.00	30.00	73.00	393 27.000
M30	3.500	22.00	18.00	26.50	180.00	35.00	85.00	393 30.000
M33	3.500	25.00	20.00	29.50	180.00	40.00	91.00	393 33.000
M36	4.000	28.00	22.00	32.00	200.00	40.00	102.00	393 36.000
M39	4.000	32.00	24.00	35.00	200.00	50.00	107.00	393 39.000
M42	4.500	32.00	24.00	37.50	200.00	45.00	112.00	393 42.000

Taps for ISO metric threads

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	HSS-E		
Tolerance on Ø	6GX	7GX	6H+0,1
Surface	A	A	A
Type	VA R45	VA R45	VA R45
Form	C	C	C
Internal cooling	✕	✕	✕





DIN 2184-1

d1	P	d2	SW	dk	l1	l2	l5	Article no.	4625	4626	4627
	mm	mm	mm	mm	mm	mm	mm	Order no.			
M2	0.400	2.80	2.10	1.60	45.00	4.50	13.50		4625 2.000	4626 2.000	4627 2.000
M2,5	0.450	2.80	2.10	2.05	50.00	5.00	14.50		4625 2.500	4626 2.500	4627 2.500
M3	0.500	3.50	2.70	2.50	56.00	6.00	18.00		4625 3.000	4626 3.000	4627 3.000
M3,5	0.600	4.00	3.00	2.90	56.00	7.00	20.00		4625 3.500	4626 3.500	4627 3.500
M4	0.700	4.50	3.40	3.30	63.00	7.50	21.00		4625 4.000	4626 4.000	4627 4.000
M5	0.800	6.00	4.90	4.20	70.00	8.50	25.00		4625 5.000	4626 5.000	4627 5.000
M6	1.000	6.00	4.90	5.00	80.00	11.00	30.00		4625 6.000	4626 6.000	4627 6.000
M8	1.250	8.00	6.20	6.80	90.00	14.00	35.00		4625 8.000	4626 8.000	4627 8.000
M10	1.500	10.00	8.00	8.50	100.00	16.00	39.00		4625 10.000	4626 10.000	4627 10.000
M12	1.750	9.00	7.00	10.20	110.00	18.50	49.00		4625 12.000	4626 12.000	4627 12.000
M14	2.000	11.00	9.00	12.00	110.00	20.00	53.00		4625 14.000	4626 14.000	4627 14.000
M16	2.000	12.00	9.00	14.00	110.00	20.00	54.00		4625 16.000	4626 16.000	4627 16.000
M18	2.500	14.00	11.00	15.50	125.00	25.00	62.00		4625 18.000	4626 18.000	4627 18.000
M20	2.500	16.00	12.00	17.50	140.00	25.00	62.00		4625 20.000	4626 20.000	4627 20.000
M24	3.000	18.00	14.50	21.00	160.00	30.00	73.00		4625 24.000	4626 24.000	4627 24.000
M30	3.500	22.00	18.00	26.50	180.00	35.00	85.00		4625 30.000	4626 30.000	4627 30.000

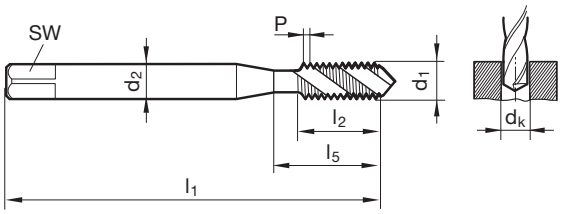
Taps for ISO metric threads

Tool material	HSS-E
Tolerance on Ø	6HX
Surface	A
Type	VA R45
Form	C
Internal cooling	

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• long version





Company std. Article no. **4633**

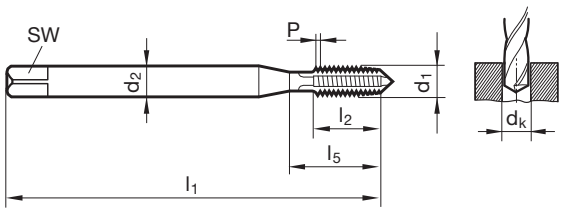
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M3	0.500	3.50	2.70	2.50	90.00	6.00	18.00	4633 3.000
M4	0.700	4.50	3.40	3.30	125.00	7.50	21.00	4633 4.000
M5	0.800	6.00	4.90	4.20	140.00	8.50	25.00	4633 5.000
M6	1.000	6.00	4.90	5.00	160.00	11.00	30.00	4633 6.000
M8	1.250	8.00	6.20	6.80	180.00	14.00	35.00	4633 8.010
M10	1.500	10.00	8.00	8.50	200.00	16.00	39.00	4633 10.010
M12	1.750	9.00	7.00	10.20	220.00	18.50	158.00	4633 12.000
M14	2.000	11.00	9.00	12.00	220.00	20.00	160.00	4633 14.000
M16	2.000	12.00	9.00	14.00	220.00	20.00	160.00	4633 16.000
M20	2.500	16.00	12.00	17.50	280.00	25.00	217.00	4633 20.000

Taps for ISO metric threads

Tool material	HSS-E
Tolerance on Ø	6HX
Surface	S
Type	VA
Form	B
Internal cooling	

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 371/DIN 376 Article no. **4218**

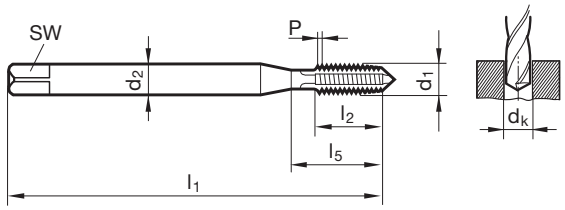
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M2	0.400	2.80	2.10	1.60	45.00	8.00	13.50	4218 2.000
M2,5	0.450	2.80	2.10	2.05	50.00	9.00	14.50	4218 2.500
M3	0.500	3.50	2.70	2.50	56.00	10.00	18.00	4218 3.000
M4	0.700	4.50	3.40	3.30	63.00	12.00	21.00	4218 4.000
M4,5	0.750	6.00	4.90	3.70	70.00	14.00	25.00	4218 4.500
M5	0.800	6.00	4.90	4.20	70.00	14.00	25.00	4218 5.000
M6	1.000	6.00	4.90	5.00	80.00	16.00	30.00	4218 6.000
M7	1.000	7.00	5.50	6.00	80.00	16.00	30.00	4218 7.000
M8	1.250	8.00	6.20	6.80	90.00	17.00	35.00	4218 8.000
M9	1.250	9.00	7.00	7.80	90.00	17.00	35.00	4218 9.000
M10	1.500	10.00	8.00	8.50	100.00	20.00	39.00	4218 10.000
M11	1.500	8.00	6.20	9.50	100.00	20.00	42.00	4218 11.000
M12	1.750	9.00	7.00	10.20	110.00	24.00	49.00	4218 12.000
M14	2.000	11.00	9.00	12.00	110.00	26.00	53.00	4218 14.000
M16	2.000	12.00	9.00	14.00	110.00	26.00	54.00	4218 16.000
M18	2.500	14.00	11.00	15.50	125.00	30.00	62.00	4218 18.000
M20	2.500	16.00	12.00	17.50	140.00	32.00	62.00	4218 20.000
M22	2.500	18.00	14.50	19.50	140.00	32.00	62.00	4218 22.000
M24	3.000	18.00	14.50	21.00	160.00	36.00	73.00	4218 24.000
M27	3.000	20.00	16.00	24.00	160.00	36.00	73.00	4218 27.000
M30	3.500	22.00	18.00	26.50	180.00	40.00	85.00	4218 30.000
M33	3.500	25.00	20.00	29.50	180.00	40.00	91.00	4218 33.000
M36	4.000	28.00	22.00	32.00	200.00	50.00	102.00	4218 36.000
M39	4.000	32.00	24.00	35.00	200.00	50.00	107.00	4218 39.000
M42	4.500	32.00	24.00	37.50	200.00	56.00	112.00	4218 42.000

Taps for ISO metric threads

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	HSS-E		
Tolerance on Ø	6GX	7GX	6H+0,1
Surface	S	S	S
Type	VA	VA	VA
Form	B	B	B
Internal cooling	✕	✕	✕





DIN 2184-1

d1	P	d2	SW	dk	l1	l2	l5	Article no. 4638	4639	4640
	mm	mm	mm	mm	mm	mm	mm	Order no.		
M2	0.400	2.80	2.10	1.60	45.00	8.00	13.50	4638 2.000	4639 2.000	4640 2.000
M2,5	0.450	2.80	2.10	2.05	50.00	9.00	14.50	4638 2.500	4639 2.500	4640 2.500
M3	0.500	3.50	2.70	2.50	56.00	10.00	18.00	4638 3.000	4639 3.000	4640 3.000
M4	0.700	4.50	3.40	3.30	63.00	12.00	21.00	4638 4.000	4639 4.000	4640 4.000
M5	0.800	6.00	4.90	4.20	70.00	14.00	25.00	4638 5.000	4639 5.000	4640 5.000
M6	1.000	6.00	4.90	5.00	80.00	16.00	30.00	4638 6.000	4639 6.000	4640 6.000
M8	1.250	8.00	6.20	6.80	90.00	17.00	35.00	4638 8.000	4639 8.000	4640 8.000
M10	1.500	10.00	8.00	8.50	100.00	20.00	39.00	4638 10.000	4639 10.000	4640 10.000
M12	1.750	9.00	7.00	10.20	110.00	24.00	49.00	4638 12.000	4639 12.000	4640 12.000
M14	2.000	11.00	9.00	12.00	110.00	26.00	53.00	4638 14.000	4639 14.000	4640 14.000
M16	2.000	12.00	9.00	14.00	110.00	26.00	54.00	4638 16.000	4639 16.000	4640 16.000
M18	2.500	14.00	11.00	15.50	125.00	30.00	62.00	4638 18.000	4639 18.000	4640 18.000
M20	2.500	16.00	12.00	17.50	140.00	32.00	62.00	4638 20.000	4639 20.000	4640 20.000
M24	3.000	18.00	14.50	21.00	160.00	36.00	73.00	4638 24.000	4639 24.000	4640 24.000
M30	3.500	22.00	18.00	26.50	180.00	40.00	85.00	4638 30.000	4639 30.000	4640 30.000

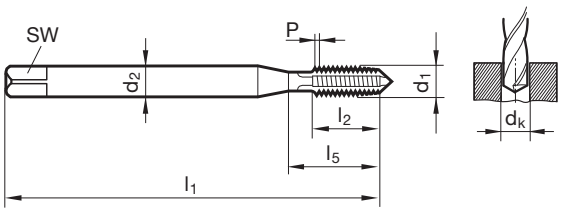
Taps for ISO metric threads

Tool material	HSS-E
Tolerance on Ø	6HX
Surface	S
Type	VA
Form	B
Internal cooling	

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

• long version





Company std. Article no. **4645**

d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M3	0.500	3.50	2.70	2.50	90.00	10.00	18.00	4645 3.000
M4	0.700	4.50	3.40	3.30	125.00	12.00	21.00	4645 4.000
M5	0.800	6.00	4.90	4.20	140.00	14.00	25.00	4645 5.000
M6	1.000	6.00	4.90	5.00	160.00	16.00	30.00	4645 6.000
M8	1.250	8.00	6.20	6.80	180.00	17.00	35.00	4645 8.010
M10	1.500	10.00	8.00	8.50	200.00	20.00	39.00	4645 10.010
M12	1.750	9.00	7.00	10.20	220.00	24.00	158.00	4645 12.000
M14	2.000	11.00	9.00	12.00	220.00	26.00	160.00	4645 14.000
M16	2.000	12.00	9.00	14.00	220.00	26.00	160.00	4645 16.000
M20	2.500	16.00	12.00	17.50	280.00	32.00	217.00	4645 20.000

XL lengths

for deep-set threads

+ bridging of interfering edges or pre-drilled holes
+ process-reliable chip removal even with difficult machining
+ outstanding service life in almost all materials

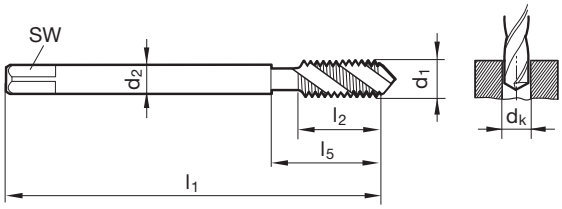


Taps for ISO metric fine threads

Tool material	HSS-E	
Tolerance on Ø	6HX	6GX
Surface	A	A
Type	VA R45	VA R45
Form	C	C
Internal cooling	✕	✕

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 374 — Article no. **394** **4628**

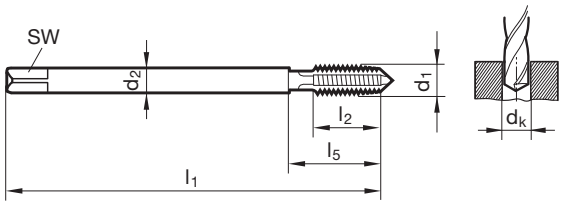
d1	d2	SW	dk	l1	l2	l5	Order no.	
	mm	mm	mm	mm	mm	mm		
M3 x 0,35	2.20	1.80	2.65	56.00	4.00	18.00	394 3.002	
M4 x 0,35	2.80	2.10	3.65	63.00	5.00	21.00	394 4.002	
M4 x 0,5	2.80	2.10	3.50	63.00	5.00	21.00	394 4.003	
M5 x 0,5	3.50	2.70	4.50	70.00	5.00	25.00	394 5.003	
M6 x 0,5	4.50	3.40	5.50	80.00	5.00	30.00	394 6.003	
M6 x 0,75	4.50	3.40	5.20	80.00	8.00	30.00	394 6.004	4628 6.004
M8 x 0,75	6.00	4.90	7.20	80.00	8.00	30.00	394 8.004	4628 8.004
M8 x 1	6.00	4.90	7.00	90.00	11.00	35.00	394 8.005	4628 8.005
M9 x 1	7.00	5.50	8.00	90.00	11.00	35.00	394 9.005	
M10 x 0,75	7.00	5.50	9.20	90.00	11.00	35.00	394 10.004	
M10 x 1	7.00	5.50	9.00	90.00	11.00	35.00	394 10.005	4628 10.005
M10 x 1,25	7.00	5.50	8.80	100.00	14.00	39.00	394 10.006	4628 10.006
M11 x 1	8.00	6.20	10.00	90.00	11.00	33.00	394 11.005	
M12 x 1	9.00	7.00	11.00	100.00	11.00	40.00	394 12.005	4628 12.005
M12 x 1,25	9.00	7.00	10.80	100.00	15.00	40.00	394 12.006	4628 12.006
M12 x 1,5	9.00	7.00	10.50	100.00	15.00	40.00	394 12.007	4628 12.007
M14 x 1	11.00	9.00	13.00	100.00	11.00	40.00	394 14.005	
M14 x 1,25	11.00	9.00	12.80	100.00	15.00	40.00	394 14.006	
M14 x 1,5	11.00	9.00	12.50	100.00	15.00	40.00	394 14.007	4628 14.007
M16 x 1	12.00	9.00	15.00	100.00	11.00	44.00	394 16.005	
M16 x 1,5	12.00	9.00	14.50	100.00	15.00	44.00	394 16.007	4628 16.007
M18 x 1	14.00	11.00	17.00	110.00	12.00	44.00	394 18.005	
M18 x 1,5	14.00	11.00	16.50	110.00	16.00	44.00	394 18.007	4628 18.007
M18 x 2	14.00	11.00	16.00	125.00	20.00	58.00	394 18.008	
M20 x 1	16.00	12.00	19.00	125.00	12.00	44.00	394 20.005	
M20 x 1,5	16.00	12.00	18.50	125.00	16.00	44.00	394 20.007	4628 20.007
M20 x 2	16.00	12.00	18.00	140.00	20.00	60.00	394 20.008	
M22 x 1	18.00	14.50	21.00	125.00	12.00	44.00	394 22.005	
M22 x 1,5	18.00	14.50	20.50	125.00	16.00	44.00	394 22.007	
M22 x 2	18.00	14.50	20.00	140.00	22.00	62.00	394 22.008	
M24 x 1	18.00	14.50	23.00	140.00	15.00	48.00	394 24.005	
M24 x 1,5	18.00	14.50	22.50	140.00	16.00	48.00	394 24.007	4628 24.007
M24 x 2	18.00	14.50	22.00	140.00	22.00	48.00	394 24.008	

Taps for ISO metric fine threads

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	HSS-E	
Tolerance on Ø	6HX	6GX
Surface	S	S
Type	VA	VA
Form	B	B
Internal cooling	✕	✕





DIN 2184-1 DIN 374 — Article no. **4219** **4641**

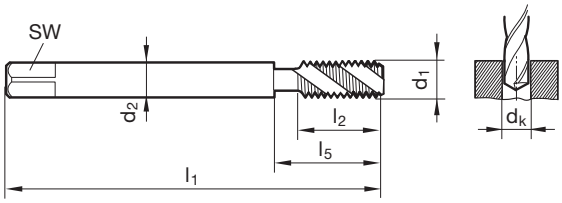
d1	d2	SW	dk	l1	l2	l5	Order no.	
	mm	mm	mm	mm	mm	mm		
M3 x 0,35	2.20	1.80	2.65	56.00	7.00	18.00	4219 3.002	
M4 x 0,35	2.80	2.10	3.65	63.00	8.00	21.00	4219 4.002	
M4 x 0,5	2.80	2.10	3.50	63.00	8.00	21.00	4219 4.003	
M5 x 0,5	3.50	2.70	4.50	70.00	10.00	25.00	4219 5.003	
M6 x 0,5	4.50	3.40	5.50	80.00	13.00	30.00	4219 6.003	
M6 x 0,75	4.50	3.40	5.20	80.00	13.00	30.00	4219 6.004	4641 6.004
M8 x 0,75	6.00	4.90	7.20	80.00	14.00	30.00	4219 8.004	4641 8.004
M8 x 1	6.00	4.90	7.00	90.00	17.00	35.00	4219 8.005	4641 8.005
M9 x 1	7.00	5.50	8.00	90.00	16.00	35.00	4219 9.005	
M10 x 0,75	7.00	5.50	9.20	90.00	16.00	35.00	4219 10.004	
M10 x 1	7.00	5.50	9.00	90.00	16.00	35.00	4219 10.005	4641 10.005
M10 x 1,25	7.00	5.50	8.80	100.00	20.00	39.00	4219 10.006	4641 10.006
M11 x 1	8.00	6.20	10.00	90.00	20.00	33.00	4219 11.005	
M12 x 1	9.00	7.00	11.00	100.00	20.00	40.00	4219 12.005	4641 12.005
M12 x 1,25	9.00	7.00	10.80	100.00	20.00	40.00	4219 12.006	4641 12.006
M12 x 1,5	9.00	7.00	10.50	100.00	20.00	40.00	4219 12.007	4641 12.007
M14 x 1	11.00	9.00	13.00	100.00	20.00	40.00	4219 14.005	
M14 x 1,25	11.00	9.00	12.80	100.00	20.00	40.00	4219 14.006	
M14 x 1,5	11.00	9.00	12.50	100.00	20.00	40.00	4219 14.007	4641 14.007
M16 x 1	12.00	9.00	15.00	100.00	22.00	44.00	4219 16.005	
M16 x 1,5	12.00	9.00	14.50	100.00	22.00	44.00	4219 16.007	4641 16.007
M18 x 1	14.00	11.00	17.00	110.00	25.00	44.00	4219 18.005	
M18 x 1,5	14.00	11.00	16.50	110.00	25.00	44.00	4219 18.007	4641 18.007
M18 x 2	14.00	11.00	16.00	125.00	30.00	58.00	4219 18.008	
M20 x 1	16.00	12.00	19.00	125.00	25.00	44.00	4219 20.005	
M20 x 1,5	16.00	12.00	18.50	125.00	25.00	44.00	4219 20.007	4641 20.007
M20 x 2	16.00	12.00	18.00	140.00	32.00	60.00	4219 20.008	
M22 x 1	18.00	14.50	21.00	125.00	25.00	44.00	4219 22.005	
M22 x 1,5	18.00	14.50	20.50	125.00	25.00	44.00	4219 22.007	
M22 x 2	18.00	14.50	20.00	140.00	32.00	62.00	4219 22.008	
M24 x 1	18.00	14.50	23.00	140.00	28.00	48.00	4219 24.005	
M24 x 1,5	18.00	14.50	22.50	140.00	28.00	48.00	4219 24.007	4641 24.007
M24 x 2	18.00	14.50	22.00	140.00	28.00	48.00	4219 24.008	

Taps for BSP threads

Tool material	HSS-E
Tolerance on Ø	
Surface	A
Type	VA R45
Form	C
Internal cooling	

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 5156 Article no. **395**

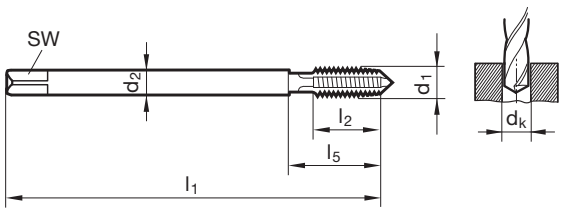
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28	6.00	4.90	6.80	90.00	11.00	30.00	395 7.723
G1/8	28	7.00	5.50	8.80	90.00	11.00	35.00	395 9.728
G1/4	19	11.00	9.00	11.80	100.00	14.00	40.00	395 13.157
G3/8	19	12.00	9.00	15.25	100.00	14.00	44.00	395 16.662
G1/2	14	16.00	12.00	19.00	125.00	18.00	44.00	395 20.955
G5/8	14	18.00	14.50	21.00	125.00	18.00	48.00	395 22.911
G3/4	14	20.00	16.00	24.50	140.00	20.00	53.00	395 26.441
G7/8	14	22.00	18.00	28.25	150.00	22.00	53.00	395 30.201
G1	11	25.00	20.00	30.75	160.00	24.00	56.00	395 33.249

Taps for BSP threads

Tool material	HSS-E
Tolerance on Ø	
Surface	S
Type	VA
Form	B
Internal cooling	

P	•
M	•
K	○
N	○
S	○
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 5156 Article no. **4220**

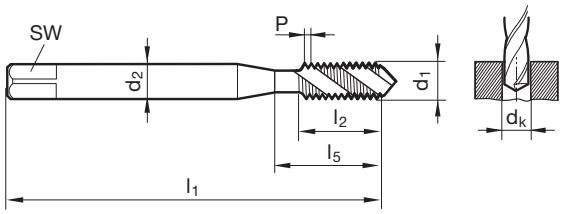
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28	6.00	4.90	6.80	90.00	18.00	30.00	4220 7.723
G1/8	28	7.00	5.50	8.80	90.00	18.00	35.00	4220 9.728
G1/4	19	11.00	9.00	11.80	100.00	20.00	40.00	4220 13.157
G3/8	19	12.00	9.00	15.25	100.00	22.00	44.00	4220 16.662
G1/2	14	16.00	12.00	19.00	125.00	25.00	44.00	4220 20.955
G5/8	14	18.00	14.50	21.00	125.00	25.00	48.00	4220 22.911
G3/4	14	20.00	16.00	24.50	140.00	28.00	53.00	4220 26.441
G7/8	14	22.00	18.00	28.25	150.00	28.00	53.00	4220 30.201
G1	11	25.00	20.00	30.75	160.00	30.00	56.00	4220 33.249

Taps for ISO metric threads

Tool material	HSS-E
Tolerance on Ø	ISO2/6H
Surface	C
Type	H R40
Form	C
Internal cooling	

P	≤ 1200
M	
K	
N	
S	
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 371 Article no. **1916**

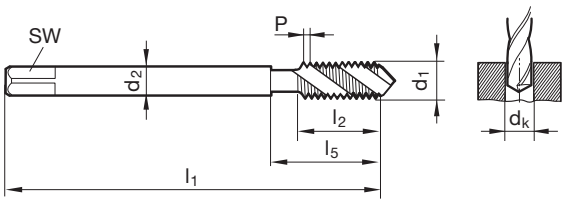
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M2	0.400	2.80	2.10	1.60	45.00	4.50	13.50	1916 2.000
M3	0.500	3.50	2.70	2.50	56.00	6.00	18.00	1916 3.000
M3,5	0.600	4.00	3.00	2.90	56.00	7.00	20.00	1916 3.500
M4	0.700	4.50	3.40	3.30	63.00	7.50	21.00	1916 4.000
M5	0.800	6.00	4.90	4.20	70.00	8.50	25.00	1916 5.000
M6	1.000	6.00	4.90	5.00	80.00	11.00	30.00	1916 6.000
M7	1.000	7.00	5.50	6.00	80.00	11.00	30.00	1916 7.000
M8	1.250	8.00	6.20	6.80	90.00	14.00	35.00	1916 8.000
M10	1.500	10.00	8.00	8.50	100.00	16.00	39.00	1916 10.000

Taps for ISO metric threads

Tool material	**HSS-E**
Tolerance on Ø	ISO2/6H
Surface	C
Type	H R40
Form	C
Internal cooling	

P	≤ 1200
M	
K	
N	
S	
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 376 Article no. **1917**

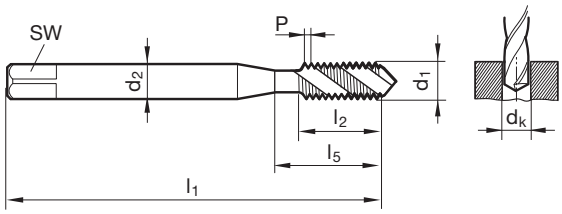
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M3	0.500	2.20	1.80	2.50	56.00	6.00	18.00	1917 3.000
M4	0.700	2.80	2.10	3.30	63.00	7.50	21.00	1917 4.000
M5	0.800	3.50	2.70	4.20	70.00	8.50	25.00	1917 5.000
M6	1.000	4.50	3.40	5.00	80.00	11.00	30.00	1917 6.000
M8	1.250	6.00	4.90	6.80	90.00	14.00	35.00	1917 8.000
M10	1.500	7.00	5.50	8.50	100.00	16.00	39.00	1917 10.000
M12	1.750	9.00	7.00	10.20	110.00	18.50	49.00	1917 12.000
M14	2.000	11.00	9.00	12.00	110.00	20.00	53.00	1917 14.000
M16	2.000	12.00	9.00	14.00	110.00	20.00	54.00	1917 16.000
M18	2.500	14.00	11.00	15.50	125.00	25.00	62.00	1917 18.000
M20	2.500	16.00	12.00	17.50	140.00	25.00	62.00	1917 20.000
M22	2.500	18.00	14.50	19.50	140.00	27.00	62.00	1917 22.000
M24	3.000	18.00	14.50	21.00	160.00	30.00	73.00	1917 24.000
M30	3.500	22.00	18.00	26.50	180.00	35.00	85.00	1917 30.000

Taps for ISO metric threads

Tool material	HSS-E-PM
Tolerance on Ø	ISO2/6H
Surface	A
Type	H R15
Form	C
Internal cooling	

P	≤ 1200
M	
K	
N	
S	
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 371 Article no. **1577**

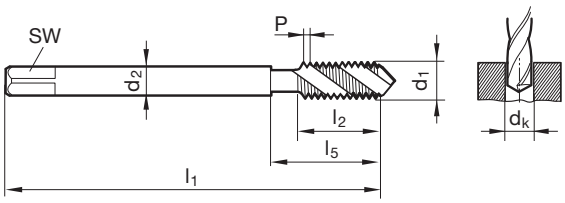
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M3	0.500	3.50	2.70	2.50	56.00	6.00	18.00	1577 3.000
M4	0.700	4.50	3.40	3.30	63.00	7.50	21.00	1577 4.000
M5	0.800	6.00	4.90	4.20	70.00	8.50	25.00	1577 5.000
M6	1.000	6.00	4.90	5.00	80.00	11.00	30.00	1577 6.000
M8	1.250	8.00	6.20	6.80	90.00	14.00	35.00	1577 8.000
M10	1.500	10.00	8.00	8.50	100.00	16.00	39.00	1577 10.000

Taps for ISO metric threads

Tool material	HSS-E-PM
Tolerance on Ø	ISO2/6H
Surface	A
Type	H R15
Form	C
Internal cooling	

P	≤ 1200
M	
K	
N	
S	
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 376 — Article no. **1578**

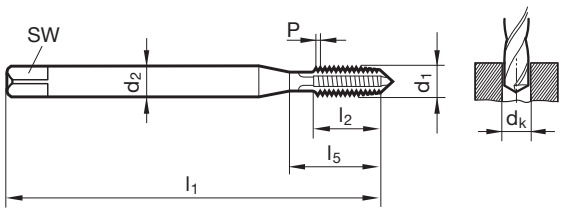
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M12	1.750	9.00	7.00	10.20	110.00	18.50	49.00	1578 12.000
M16	2.000	12.00	9.00	14.00	110.00	20.00	54.00	1578 16.000
M20	2.500	16.00	12.00	17.50	140.00	25.00	62.00	1578 20.000

Taps for ISO metric threads

Tool material	HSS-E
Tolerance on Ø	ISO2/6H
Surface	C
Type	H
Form	B
Internal cooling	

P	≤ 1200
M	
K	
N	
S	
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 371 Article no. **1914**

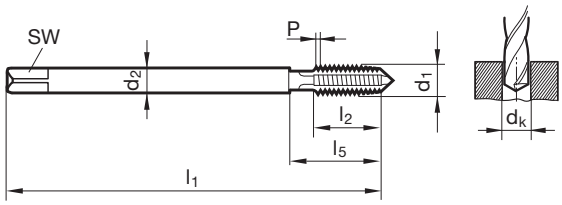
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M2,2	0.450	2.80	2.10	1.75	45.00	9.00	14.50	1914 2.200
M2,3	0.400	2.80	2.10	1.90	45.00	9.00	14.50	1914 2.300
M2	0.400	2.80	2.10	1.60	45.00	8.00	13.50	1914 2.000
M2,5	0.450	2.80	2.10	2.05	50.00	9.00	14.50	1914 2.500
M2,6	0.450	2.80	2.10	2.15	50.00	9.00	14.50	1914 2.600
M3	0.500	3.50	2.70	2.50	56.00	10.00	18.00	1914 3.000
M3,5	0.600	4.00	3.00	2.90	56.00	12.00	20.00	1914 3.500
M4	0.700	4.50	3.40	3.30	63.00	12.00	21.00	1914 4.000
M5	0.800	6.00	4.90	4.20	70.00	14.00	25.00	1914 5.000
M6	1.000	6.00	4.90	5.00	80.00	16.00	30.00	1914 6.000
M8	1.250	8.00	6.20	6.80	90.00	17.00	35.00	1914 8.000
M10	1.500	10.00	8.00	8.50	100.00	20.00	39.00	1914 10.000

Taps for ISO metric threads

Tool material	HSS-E
Tolerance on Ø	ISO2/6H
Surface	C
Type	H
Form	B
Internal cooling	

P	≤ 1200
M	
K	
N	
S	
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 376 Article no. **1915**

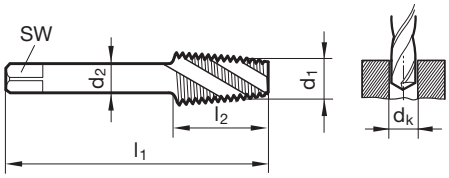
d1	P	d2	SW	dk	l1	l2	l5	Order no.
	mm	mm	mm	mm	mm	mm	mm	
M3	0.500	2.20	1.80	2.50	56.00	10.00	18.00	1915 3.000
M4	0.700	2.80	2.10	3.30	63.00	12.00	21.00	1915 4.000
M5	0.800	3.50	2.70	4.20	70.00	14.00	25.00	1915 5.000
M6	1.000	4.50	3.40	5.00	80.00	16.00	30.00	1915 6.000
M8	1.250	6.00	4.90	6.80	90.00	17.00	35.00	1915 8.000
M10	1.500	7.00	5.50	8.50	100.00	20.00	39.00	1915 10.000
M12	1.750	9.00	7.00	10.20	110.00	24.00	49.00	1915 12.000
M14	2.000	11.00	9.00	12.00	110.00	26.00	53.00	1915 14.000
M16	2.000	12.00	9.00	14.00	110.00	26.00	54.00	1915 16.000
M18	2.500	14.00	11.00	15.50	125.00	30.00	62.00	1915 18.000
M20	2.500	16.00	12.00	17.50	140.00	32.00	62.00	1915 20.000
M24	3.000	18.00	14.50	21.00	160.00	36.00	73.00	1915 24.000

Taps for NPT threads

Tool material	HSS-E
Tolerance on Ø	
Surface	S
Type	N
Form	C
Internal cooling	

P	≤ 1000
M	•
K	○
N	○
S	
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





Company std. Article no. **1088**

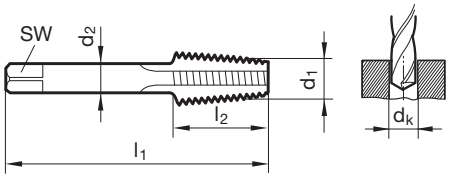
d1	P	d2	SW	dk	l1	l2	Order no.
	G/inch	mm	mm	mm	mm	mm	
1/16	27	8.00	6.20	6.25	90.00	14.00	1088 8.190
1/8	27	11.00	9.00	8.50	90.00	15.00	1088 10.620
1/4	18	14.00	11.00	11.20	100.00	21.00	1088 14.140
3/8	18	16.00	12.00	14.40	110.00	21.00	1088 17.570
1/2	14	18.00	14.50	18.00	125.00	27.00	1088 21.900
3/4	14	22.00	18.00	23.40	140.00	27.00	1088 27.230
1	11	25.00	20.00	29.10	170.00	32.00	1088 34.180

Taps for Rc (BSPT) threads

Tool material	HSS-E-PM
Tolerance on Ø	
Surface	A
Type	H
Form	C
Internal cooling	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 5156 Article no. **4683**

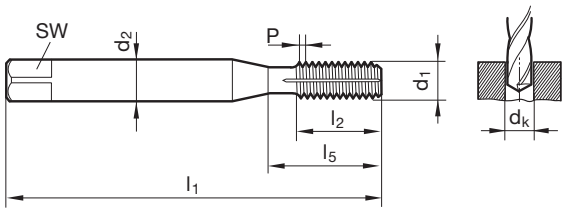
D	P	d2	SW	dk	l1	l2	l5	Order no.
	G/inch	mm	mm	mm	mm	mm	mm	
Rc1/8	28	7.00	5.50	8.20	90.00	18.00	35.00	4683 9.728
Rc1/4	19	11.00	9.00	10.85	100.00	20.00	40.00	4683 13.157
Rc3/8	19	12.00	9.00	14.30	100.00	22.00	44.00	4683 16.662
Rc1/2	14	16.00	12.00	17.80	125.00	25.00	44.00	4683 20.955
Rc3/4	14	20.00	16.00	23.20	140.00	28.00	53.00	4683 26.441
Rc1	11	25.00	20.00	29.20	160.00	30.00	56.00	4683 33.249

Fluteless taps for ISO metric threads

P	•
M	•
K	•
N	○
S	•
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	HSS-E-PM	
Tolerance on Ø	4HX/6HX	6GX
Surface	C	C
Type	N	N
Form	C	C
Internal cooling		





DIN 2174 ~DIN 371/~DIN 376 — Article no. **4487** **4488**

d1	P	d2	SW	dk	l1	l2	l5	Order no.	
	mm	mm	mm	mm	mm	mm	mm		
M1	0.250	2.50	2.10	0.90	40.00	4.00	4.00	4487 1.000	
M1,2	0.250	2.50	2.10	1.10	40.00	4.80	4.80	4487 1.200	
M1,4	0.300	2.50	2.10	1.25	40.00	5.60	5.60	4487 1.400	
M1,6	0.350	2.50	2.10	1.45	40.00	6.40	6.40	4487 1.600	
M1,7	0.350	2.50	2.10	1.55	40.00	6.80	6.80	4487 1.700	
M1,8	0.350	2.50	2.10	1.65	40.00	7.30	7.30	4487 1.800	
M2	0.400	2.80	2.10	1.85	45.00	8.00	13.50	4487 2.000	4488 2.000
M2,5	0.450	2.80	2.10	2.30	50.00	9.00	14.50	4487 2.500	4488 2.500
M3	0.500	3.50	2.70	2.80	56.00	10.00	18.00	4487 3.000	4488 3.000
M3,5	0.600	4.00	3.00	3.25	56.00	12.00	20.00	4487 3.500	
M4	0.700	4.50	3.40	3.70	63.00	12.00	21.00	4487 4.000	4488 4.000
M4,5	0.750	6.00	4.90	4.20	70.00	14.00	25.00	4487 4.500	
M5	0.800	6.00	4.90	4.65	70.00	14.00	25.00	4487 5.000	4488 5.000
M6	1.000	6.00	4.90	5.55	80.00	16.00	30.00	4487 6.000	4488 6.000
M7	1.000	7.00	5.50	6.55	80.00	16.00	30.00	4487 7.000	
M8	1.250	8.00	6.20	7.40	90.00	17.00	35.00	4487 8.000	4488 8.000
M9	1.250	9.00	7.00	8.40	90.00	17.00	35.00	4487 9.000	
M10	1.500	10.00	8.00	9.30	100.00	20.00	39.00	4487 10.000	4488 10.000
M11	1.500	8.00	6.20	10.30	100.00	20.00	42.00	4487 11.000	
M12	1.750	9.00	7.00	11.20	110.00	24.00	49.00	4487 12.000	4488 12.000
M14	2.000	11.00	9.00	13.10	110.00	26.00	53.00	4487 14.000	4488 14.000
M16	2.000	12.00	9.00	15.10	110.00	26.00	54.00	4487 16.000	4488 16.000
M20	2.500	16.00	12.00	18.90	140.00	32.00	62.00	4487 20.000	4488 20.000

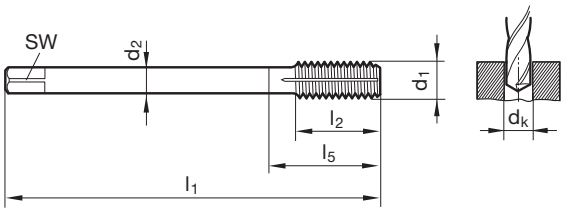
Article no. 4487 from Ø M2 with oil grooves, Ø tolerance ≤ M1.4 = 4HX

Fluteless taps for ISO metric fine threads

P	•
M	•
K	•
N	○
S	•
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.

Tool material	HSS-E-PM	
Tolerance on Ø	6HX	6GX
Surface	C	C
Type	N	N
Form	C	C
Internal cooling		





DIN 2174 ~DIN 374 — Article no. **4489** **4490**

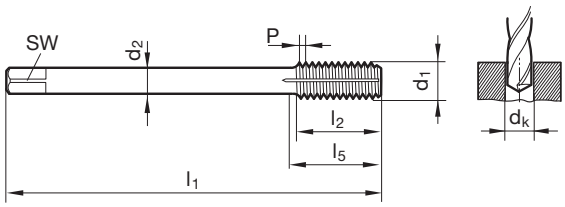
d1	d2	SW	dk	l1	l2	l5	Order no.	
	mm	mm	mm	mm	mm	mm		
M3 x 0,35	2.20	1.80	2.85	56.00	7.00	18.00	4489 3.002	
M4 x 0,35	2.80	2.10	3.85	63.00	8.00	21.00	4489 4.002	
M4 x 0,5	2.80	2.10	3.80	63.00	8.00	21.00	4489 4.003	
M5 x 0,5	3.50	2.70	4.80	70.00	10.00	25.00	4489 5.003	
M6 x 0,5	4.50	3.40	5.75	80.00	13.00	30.00	4489 6.003	
M6 x 0,75	4.50	3.40	5.65	80.00	13.00	30.00	4489 6.004	
M8 x 0,75	6.00	4.90	7.65	80.00	14.00	30.00	4489 8.004	
M8 x 1	6.00	4.90	7.55	90.00	17.00	35.00	4489 8.005	4490 8.005
M9 x 1	7.00	5.50	8.55	90.00	16.00	35.00	4489 9.005	
M10 x 0,75	7.00	5.50	9.65	90.00	16.00	35.00	4489 10.004	
M10 x 1	7.00	5.50	9.55	90.00	16.00	35.00	4489 10.005	4490 10.005
M10 x 1,25	7.00	5.50	9.40	100.00	20.00	39.00	4489 10.006	4490 10.006
M11 x 1	8.00	6.20	10.55	90.00	20.00	33.00	4489 11.005	
M12 x 1	9.00	7.00	11.55	100.00	20.00	40.00	4489 12.005	
M12 x 1,25	9.00	7.00	11.40	100.00	20.00	40.00	4489 12.006	4490 12.006
M12 x 1,5	9.00	7.00	11.30	100.00	20.00	40.00	4489 12.007	4490 12.007
M14 x 1	11.00	9.00	13.55	100.00	20.00	40.00	4489 14.005	
M14 x 1,25	11.00	9.00	13.40	100.00	20.00	40.00	4489 14.006	4490 14.006
M14 x 1,5	11.00	9.00	13.30	100.00	20.00	40.00	4489 14.007	4490 14.007
M16 x 1	12.00	9.00	15.55	100.00	22.00	44.00	4489 16.005	
M16 x 1,5	12.00	9.00	15.30	100.00	22.00	44.00	4489 16.007	4490 16.007
M18 x 1	14.00	11.00	17.55	110.00	25.00	44.00	4489 18.005	
M18 x 1,5	14.00	11.00	17.30	110.00	25.00	44.00	4489 18.007	
M18 x 2	14.00	11.00	17.10	125.00	30.00	58.00	4489 18.008	
M20 x 1	16.00	12.00	19.55	125.00	25.00	44.00	4489 20.005	
M20 x 1,5	16.00	12.00	19.30	125.00	25.00	44.00	4489 20.007	4490 20.007
M20 x 2	16.00	12.00	19.10	140.00	32.00	60.00	4489 20.008	
M22 x 1	18.00	14.50	21.55	125.00	25.00	44.00	4489 22.005	
M22 x 1,5	18.00	14.50	21.30	125.00	25.00	44.00	4489 22.007	
M22 x 2	18.00	14.50	21.10	140.00	32.00	62.00	4489 22.008	
M24 x 1	18.00	14.50	23.55	140.00	28.00	48.00	4489 24.005	
M24 x 1,5	18.00	14.50	23.30	140.00	28.00	48.00	4489 24.007	
M24 x 2	18.00	14.50	23.10	140.00	28.00	48.00	4489 24.008	

Fluteless taps for BSP threads

Tool material	HSS-E-PM
Tolerance on Ø	
Surface	C
Type	N
Form	C
Internal cooling	

P	•
M	•
K	•
N	○
S	•
H	

You can find the cutting data in our online navigator at https://webnavigator.guehring.de.





DIN 2184-1 DIN 2189 — Article no. **4493**

d1	P	d2	SW	dk	l1	l2	l5	Order no.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/8	28	7.00	5.50	9.30	90.00	18.00	35.00	4493 9.728
G1/4	19	11.00	9.00	12.50	100.00	20.00	40.00	4493 13.157
G3/8	19	12.00	9.00	16.00	100.00	22.00	44.00	4493 16.662
G1/2	14	16.00	12.00	20.00	125.00	25.00	44.00	4493 20.955



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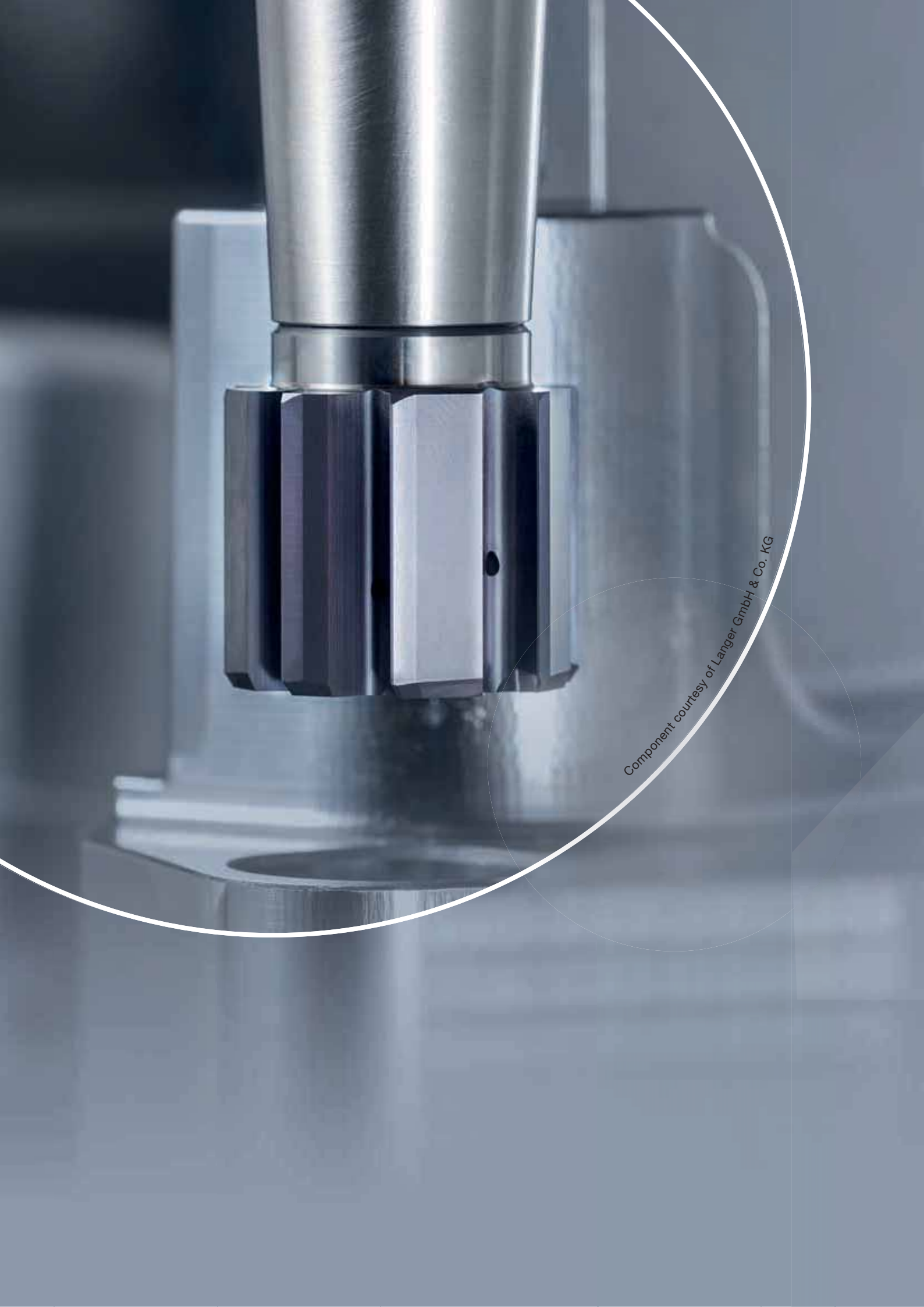
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Component courtesy of Langer GmbH & Co. KG

REAMING & COUNTER-SINKING

4

Solid carbide reamers	*P. 388*
HSS reamers	*P. 407*
Countersinks	*P. 415*

REAMING & COUNTERSINKING **OVERVIEW**

Solid carbide reamers

P M H S

- High-performance reaming in both high-strength and hardened tool steels of H7 fits or 0.01 over/undersizes with perfect surfaces. Time-saving and reliable with internal cooling for the highest cutting values and perfect chip removal in blind and through-holes. Many dimensions and lengths available as standard. Excess lengths for large machining depths can be flexibly achieved with our HR 500 T and various shrink extensions.

HSS reamers

P M N S K

- Universal reaming of H7 fits or 0.01 over/undersizes in tool steels and many other materials. Can be used on NC and conventional machines without internal cooling. Many dimensions are available with cylindrical shank and morse taper adaptor as standard.

Countersinks

P M N H S K

- SpyroTec spiral countersinks are used to produce perfectly round, rattle-free countersinks with 60°, 82° and 90°. Thanks to reduced cutting forces, even large countersinks can be produced with manual machines. Extra-long versions enable bridging of interfering contours and machining of deeper recesses.



P. 388

P. 407

P. 415

P	M	K	N	S	H	Tool illustration	Shank form	Hard-ness	Standard	Form	Cutting direction	Tool material	Sur-face	d1/mm	Article no.	Page
High-performance reamers																
•	•	○		•	•		HA	65 HRC	WN		R	VHM	a	2.000 - 20.000	1685	388
•	•	○		•	•		HA	65 HRC	WN		R	VHM	a	2.000 - 20.000	1686	389
•	•	○		•	•		HA	65 HRC	WN		R	VHM	a	1.970 - 12.030	1675	390
•	•	○		•	•		HA	65 HRC	WN		R	VHM	a	1.970 - 12.030	1676	392
•	•	○		•	•		HA	65 HRC	WN		R	VHM	a	14.000 - 42.000	1548	394
•	•	○		•	•		HA	65 HRC	WN		R	VHM	a	14.000 - 42.000	1549	395
•	•	•	○	○	○		HA	48 HRC	WN		R	HM	a	22.000 - 40.000	1680	396
•	•	•	○	○	○		HA	48 HRC	WN		R	HM	a	22.000 - 40.000	1681	397
NC machine reamers																
•	○	•	•	○	○		HA	48 HRC	WN	B	R	VHM	○	3.000 - 20.000	6016	400
•	•	•		•	•		HA	55 HRC	WN	B	R	VHM	a	3.000 - 20.000	6017	401
•	○	•	•	○	○		HA	48 HRC	WN	B	R	VHM	○	0.980 - 12.050	5527	402
•	•	•		•	•		HA	55 HRC	WN	B	R	VHM	a	0.980 - 12.050	6018	404
Machine reamers																
•	○	•	•	•	○		MK	48 HRC	~DIN 8094	B	R	HM	○	5.000 - 40.000	1411	406
NC machine reamers																
•	○	•	•	○			HA		DIN 212-3	B	R	HSS-E	○	1.500 - 20.000	6019	407
•	○	•	•	○			HA		DIN 212-3	B	R	HSS-E	○	1.000 - 12.030	6020	408
Machine reamers																
•	○	•	•	•			MK		DIN 208	B	R	HSS-E	○	3.000 - 50.000	405	410
Hand reamers																
•		•	•				Cyl		DIN 206	B	R	HSS	○	1.000 - 60.000	413	412

P	M	K	N	S	H	Tool illustration	Shank form	Standard	Form	Cutting direction	Tool material	Surface	d1/mm	Article no.	Page
90° Countersinks, spiral-fluted															
•	•	•	○	○			Cyl	DIN 335	C	R	HSCO	A	6.300 - 40.000	5500	415
•	•	•	○	○			3	DIN 335	C	R	HSCO	A	6.300 - 40.000	5501	416
•	○	•	○	○			Cyl	WN	C	R	HSS	A	6.300 - 31.000	5503	417
90° Countersink sets, spiral-fluted															
•	•	•	○	○			Cyl	DIN 335	C	R	HSCO	A		5538	418
•	•	•	○	○			3	DIN 335	C	R	HSCO	A		5539	419
60° Countersinks, spiral-fluted															
•	•	•	○	○			Cyl	DIN 334	C	R	HSS	A	6.300 - 25.000	5670	420
•	•	•	○	○			3	DIN 334	C	R	HSS	A	6.300 - 25.000	5671	421
60° Countersink sets, spiral-fluted															
•	•	•	○	○			Cyl	DIN 334	C	R	HSS	A		5672	422
•	•	•	○	○			3	DIN 334	C	R	HSS	A		5673	423
82° Countersinks, spiral-fluted															
•	•	•	○	○			Cyl	WN	C	R	HSCO	A	6.350 - 31.750	5674	424

P	M	K	N	S	H	Tool illustration	Shank form	Standard	Form	Cutting direction	Tool material	Surface	d1/mm	Article no.	Page
82° Countersinks, spiral-fluted															
•	•	•	○	○			3	WN	C	R	HSCO	A	6.350 - 31.750	5675	425
82° Countersink sets, spiral-fluted															
•	•	•	○	○			Cyl	WN	C	R	HSCO	A		5676	426
•	•	•	○	○			3	WN	C	R	HSCO	A		5677	427

HR 500

High-performance reaming up to 65 HRC

+ universally usable in unhardened and hardened materials up to 65 HRC
+ create perfect fits with process reliability
+ High-performance reaming with internal cooling in H7 tolerance or in 0.01 increments possible



High-performance reamers

WN | HA | R | H7 | EU | 65 HRC

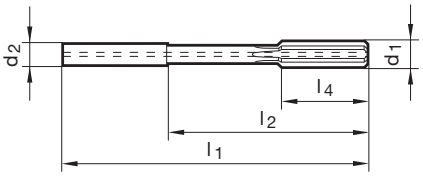
P	•
M	•
K	○
N	
S	•
H	•

- with axial coolant duct
- for clamping in hydraulic chucks or shrink fit chucks

Tool material	**Solid carbide**
Surface	a
Form	
Type	HR 500 S

GÜHRINGNAVIGATOR

Cutting data page 428





Article no.	**1685**

d1	d2 h6	l1	l2	l4	Z	**Order no.**
mm	mm	mm	mm	mm		
2.000	4.000	50.000	22.000	8.000	4	1685 2.000
2.500	4.000	50.000	22.000	8.000	4	1685 2.500
3.000	4.000	68.000	40.000	12.000	4	1685 3.000
3.500	4.000	68.000	40.000	12.000	4	1685 3.500
4.000	4.000	68.000	40.000	12.000	4	1685 4.000
4.500	6.000	76.000	40.000	12.000	4	1685 4.500
5.000	6.000	76.000	40.000	12.000	4	1685 5.000
5.500	6.000	76.000	40.000	12.000	4	1685 5.500
6.000	6.000	76.000	40.000	12.000	4	1685 6.000
6.500	8.000	101.000	65.000	16.000	6	1685 6.500
7.000	8.000	101.000	65.000	16.000	6	1685 7.000
7.500	8.000	101.000	65.000	16.000	6	1685 7.500
8.000	8.000	101.000	65.000	16.000	6	1685 8.000
8.500	10.000	101.000	61.000	19.000	6	1685 8.500
9.000	10.000	101.000	61.000	19.000	6	1685 9.000
9.500	10.000	101.000	61.000	19.000	6	1685 9.500
10.000	10.000	101.000	61.000	19.000	6	1685 10.000
10.500	12.000	130.000	85.000	19.000	6	1685 10.500
11.000	12.000	130.000	85.000	19.000	6	1685 11.000
11.500	12.000	130.000	85.000	19.000	6	1685 11.500
12.000	12.000	130.000	85.000	19.000	6	1685 12.000
13.000	14.000	130.000	85.000	22.000	6	1685 13.000
14.000	14.000	130.000	85.000	22.000	6	1685 14.000
15.000	16.000	150.000	102.000	22.000	6	1685 15.000
16.000	16.000	150.000	102.000	22.000	6	1685 16.000
17.000	18.000	150.000	102.000	25.000	6	1685 17.000
18.000	18.000	150.000	102.000	25.000	6	1685 18.000
19.000	20.000	150.000	100.000	25.000	6	1685 19.000
20.000	20.000	150.000	100.000	25.000	6	1685 20.000

High-performance reamers

WN | HA | R | H7 | EU | 65 HRC

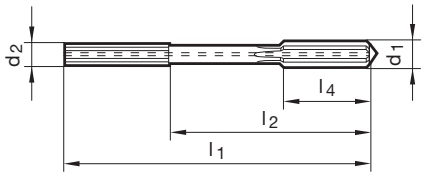
Tool material	**Solid carbide**
Surface	a
Form	
Type	HR 500 D

P	•
M	•
K	○
N	
S	•
H	•

- < Ø 2.950 with axial, off-centre coolant ducts through the shank
- ≥ Ø 2.950 with longitudinal flutes on the shank for coolant supply
- for clamping in hydraulic chucks or shrink fit chucks

GÜHRINGNAVIGATOR

Cutting data page 428





Article no. **1686**

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
2.000	4.000	50.000	22.000	8.000	4	1686 2.000
2.500	4.000	50.000	22.000	8.000	4	1686 2.500
3.000	4.000	68.000	40.000	12.000	4	1686 3.000
3.500	4.000	68.000	40.000	12.000	4	1686 3.500
4.000	4.000	68.000	40.000	12.000	4	1686 4.000
4.500	6.000	76.000	40.000	12.000	4	1686 4.500
5.000	6.000	76.000	40.000	12.000	4	1686 5.000
5.500	6.000	76.000	40.000	12.000	4	1686 5.500
6.000	6.000	76.000	40.000	12.000	4	1686 6.000
6.500	8.000	101.000	65.000	16.000	6	1686 6.500
7.000	8.000	101.000	65.000	16.000	6	1686 7.000
7.500	8.000	101.000	65.000	16.000	6	1686 7.500
8.000	8.000	101.000	65.000	16.000	6	1686 8.000
8.500	10.000	101.000	61.000	19.000	6	1686 8.500
9.000	10.000	101.000	61.000	19.000	6	1686 9.000
9.500	10.000	101.000	61.000	19.000	6	1686 9.500
10.000	10.000	101.000	61.000	19.000	6	1686 10.000
10.500	12.000	130.000	85.000	19.000	6	1686 10.500
11.000	12.000	130.000	85.000	19.000	6	1686 11.000
11.500	12.000	130.000	85.000	19.000	6	1686 11.500
12.000	12.000	130.000	85.000	19.000	6	1686 12.000
13.000	14.000	130.000	85.000	22.000	6	1686 13.000
14.000	14.000	130.000	85.000	22.000	6	1686 14.000
15.000	16.000	150.000	102.000	22.000	6	1686 15.000
16.000	16.000	150.000	102.000	22.000	6	1686 16.000
17.000	18.000	150.000	102.000	25.000	6	1686 17.000
18.000	18.000	150.000	102.000	25.000	6	1686 18.000
19.000	20.000	150.000	100.000	25.000	6	1686 19.000
20.000	20.000	150.000	100.000	25.000	6	1686 20.000

High-performance reamers

WN | HA | R | +0,005 | EU | 65 HRC

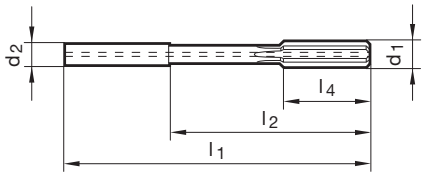
Tool material	Solid carbide
Surface	a
Form	
Type	HR 500 S

P	•
M	•
K	○
N	
S	•
H	•

- with axial coolant duct
- for clamping in hydraulic chucks or shrink fit chucks

GÜHRINGNAVIGATOR

Cutting data page 428





Article no. **1675**

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
1.970	4.000	50.000	22.000	8.000	4	1675 1.970
1.980	4.000	50.000	22.000	8.000	4	1675 1.980
1.990	4.000	50.000	22.000	8.000	4	1675 1.990
2.000	4.000	50.000	22.000	8.000	4	1675 2.000
2.010	4.000	50.000	22.000	8.000	4	1675 2.010
2.020	4.000	50.000	22.000	8.000	4	1675 2.020
2.030	4.000	50.000	22.000	8.000	4	1675 2.030
2.970	4.000	68.000	40.000	12.000	4	1675 2.970
2.980	4.000	68.000	40.000	12.000	4	1675 2.980
2.990	4.000	68.000	40.000	12.000	4	1675 2.990
3.000	4.000	68.000	40.000	12.000	4	1675 3.000
3.010	4.000	68.000	40.000	12.000	4	1675 3.010
3.020	4.000	68.000	40.000	12.000	4	1675 3.020
3.030	4.000	68.000	40.000	12.000	4	1675 3.030
3.970	4.000	68.000	40.000	12.000	4	1675 3.970
3.980	4.000	68.000	40.000	12.000	4	1675 3.980
3.990	4.000	68.000	40.000	12.000	4	1675 3.990
4.000	4.000	68.000	40.000	12.000	4	1675 4.000
4.010	4.000	68.000	40.000	12.000	4	1675 4.010
4.020	4.000	68.000	40.000	12.000	4	1675 4.020
4.030	4.000	68.000	40.000	12.000	4	1675 4.030
4.970	6.000	76.000	40.000	12.000	4	1675 4.970
4.980	6.000	76.000	40.000	12.000	4	1675 4.980
4.990	6.000	76.000	40.000	12.000	4	1675 4.990
5.000	6.000	76.000	40.000	12.000	4	1675 5.000
5.010	6.000	76.000	40.000	12.000	4	1675 5.010
5.020	6.000	76.000	40.000	12.000	4	1675 5.020
5.030	6.000	76.000	40.000	12.000	4	1675 5.030
5.970	6.000	76.000	40.000	12.000	4	1675 5.970
5.980	6.000	76.000	40.000	12.000	4	1675 5.980
5.990	6.000	76.000	40.000	12.000	4	1675 5.990
6.000	6.000	76.000	40.000	12.000	4	1675 6.000
6.010	6.000	76.000	40.000	12.000	4	1675 6.010
6.020	6.000	76.000	40.000	12.000	4	1675 6.020
6.030	6.000	76.000	40.000	12.000	4	1675 6.030
7.000	8.000	101.000	65.000	16.000	6	1675 7.000

						Article no.	1675
d1	d2 h6	l1	l2	l4	Z	**Order no.**	
mm	mm	mm	mm	mm			
7.970	8.000	101.000	65.000	16.000	6	1675 7.970	
7.980	8.000	101.000	65.000	16.000	6	1675 7.980	
7.990	8.000	101.000	65.000	16.000	6	1675 7.990	
8.000	8.000	101.000	65.000	16.000	6	1675 8.000	
8.010	8.000	101.000	65.000	16.000	6	1675 8.010	
8.020	8.000	101.000	65.000	16.000	6	1675 8.020	
8.030	8.000	101.000	65.000	16.000	6	1675 8.030	
9.000	10.000	101.000	61.000	19.000	6	1675 9.000	
9.970	10.000	101.000	61.000	19.000	6	1675 9.970	
9.980	10.000	101.000	61.000	19.000	6	1675 9.980	
9.990	10.000	101.000	61.000	19.000	6	1675 9.990	
10.000	10.000	101.000	61.000	19.000	6	1675 10.000	
10.010	10.000	101.000	61.000	19.000	6	1675 10.010	
10.020	10.000	101.000	61.000	19.000	6	1675 10.020	
10.030	10.000	101.000	61.000	19.000	6	1675 10.030	
11.000	12.000	130.000	85.000	19.000	6	1675 11.000	
11.970	12.000	130.000	85.000	19.000	6	1675 11.970	
11.980	12.000	130.000	85.000	19.000	6	1675 11.980	
11.990	12.000	130.000	85.000	19.000	6	1675 11.990	
12.000	12.000	130.000	85.000	19.000	6	1675 12.000	
12.010	12.000	130.000	85.000	19.000	6	1675 12.010	
12.020	12.000	130.000	85.000	19.000	6	1675 12.020	
12.030	12.000	130.000	85.000	19.000	6	1675 12.030	

High-performance reamers

WN | HA | R | +0,005 | EU | 65 HRC

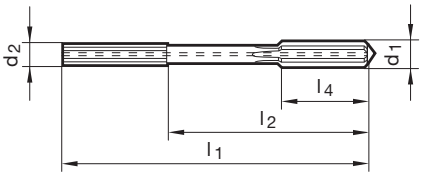
Tool material	**Solid carbide**
Surface	a
Form	
Type	HR 500 D

P	•
M	•
K	○
N	
S	•
H	•

- < Ø 2.950 with axial, off-centre coolant ducts through the shank
- ≥ Ø 2.950 with longitudinal flutes on the shank for coolant supply
- for clamping in hydraulic chucks or shrink fit chucks

GÜHRINGNAVIGATOR

Cutting data page 428





Article no. **1676**

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
1.970	4.000	50.000	22.000	8.000	4	1676 1.970
1.980	4.000	50.000	22.000	8.000	4	1676 1.980
1.990	4.000	50.000	22.000	8.000	4	1676 1.990
2.000	4.000	50.000	22.000	8.000	4	1676 2.000
2.010	4.000	50.000	22.000	8.000	4	1676 2.010
2.020	4.000	50.000	22.000	8.000	4	1676 2.020
2.030	4.000	50.000	22.000	8.000	4	1676 2.030
2.970	4.000	68.000	40.000	12.000	4	1676 2.970
2.980	4.000	68.000	40.000	12.000	4	1676 2.980
2.990	4.000	68.000	40.000	12.000	4	1676 2.990
3.000	4.000	68.000	40.000	12.000	4	1676 3.000
3.010	4.000	68.000	40.000	12.000	4	1676 3.010
3.020	4.000	68.000	40.000	12.000	4	1676 3.020
3.030	4.000	68.000	40.000	12.000	4	1676 3.030
3.970	4.000	68.000	40.000	12.000	4	1676 3.970
3.980	4.000	68.000	40.000	12.000	4	1676 3.980
3.990	4.000	68.000	40.000	12.000	4	1676 3.990
4.000	4.000	68.000	40.000	12.000	4	1676 4.000
4.010	4.000	68.000	40.000	12.000	4	1676 4.010
4.020	4.000	68.000	40.000	12.000	4	1676 4.020
4.030	4.000	68.000	40.000	12.000	4	1676 4.030
4.970	6.000	76.000	40.000	12.000	4	1676 4.970
4.980	6.000	76.000	40.000	12.000	4	1676 4.980
4.990	6.000	76.000	40.000	12.000	4	1676 4.990
5.000	6.000	76.000	40.000	12.000	4	1676 5.000
5.010	6.000	76.000	40.000	12.000	4	1676 5.010
5.020	6.000	76.000	40.000	12.000	4	1676 5.020
5.030	6.000	76.000	40.000	12.000	4	1676 5.030
5.970	6.000	76.000	40.000	12.000	4	1676 5.970
5.980	6.000	76.000	40.000	12.000	4	1676 5.980
5.990	6.000	76.000	40.000	12.000	4	1676 5.990
6.000	6.000	76.000	40.000	12.000	4	1676 6.000
6.010	6.000	76.000	40.000	12.000	4	1676 6.010
6.020	6.000	76.000	40.000	12.000	4	1676 6.020
6.030	6.000	76.000	40.000	12.000	4	1676 6.030
7.000	8.000	101.000	65.000	16.000	6	1676 7.000

						Article no.	**1676**
d1	d2 h6	l1	l2	l4	Z	**Order no.**
mm	mm	mm	mm	mm		
7.970	8.000	101.000	65.000	16.000	6	1676 7.970
7.980	8.000	101.000	65.000	16.000	6	1676 7.980
7.990	8.000	101.000	65.000	16.000	6	1676 7.990
8.000	8.000	101.000	65.000	16.000	6	1676 8.000
8.010	8.000	101.000	65.000	16.000	6	1676 8.010
8.020	8.000	101.000	65.000	16.000	6	1676 8.020
8.030	8.000	101.000	65.000	16.000	6	1676 8.030
9.000	10.000	101.000	61.000	19.000	6	1676 9.000
9.970	10.000	101.000	61.000	19.000	6	1676 9.970
9.980	10.000	101.000	61.000	19.000	6	1676 9.980
9.990	10.000	101.000	61.000	19.000	6	1676 9.990
10.000	10.000	101.000	61.000	19.000	6	1676 10.000
10.010	10.000	101.000	61.000	19.000	6	1676 10.010
10.020	10.000	101.000	61.000	19.000	6	1676 10.020
10.030	10.000	101.000	61.000	19.000	6	1676 10.030
11.000	12.000	130.000	85.000	19.000	6	1676 11.000
11.970	12.000	130.000	85.000	19.000	6	1676 11.970
11.980	12.000	130.000	85.000	19.000	6	1676 11.980
11.990	12.000	130.000	85.000	19.000	6	1676 11.990
12.000	12.000	130.000	85.000	19.000	6	1676 12.000
12.010	12.000	130.000	85.000	19.000	6	1676 12.010
12.020	12.000	130.000	85.000	19.000	6	1676 12.020
12.030	12.000	130.000	85.000	19.000	6	1676 12.030

High-performance reamers

WN | HA | R | H7 | EU | 65 HRC

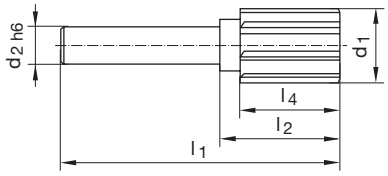
Tool material	**Solid carbide**
Surface	a
Form	
Type	HR 500 TS

P	•
M	•
K	○
N	
S	•
H	•

- for clamping in hydraulic and shrink fit chucks
- for extension, shrink extensions e.g. art. no. 4719 are recommended

GÜHRINGNAVIGATOR

Cutting data page 428





Article no.	**1548**

d1	d2 h6	l1	l2	l4	Z	**Order no.**
mm	mm	mm	mm	mm		
14.000	6.000	66.000	30.000	25.000	8	1548 14.000
15.000	6.000	66.000	30.000	25.000	8	1548 15.000
16.000	8.000	66.000	30.000	25.000	8	1548 16.000
18.000	8.000	66.000	30.000	25.000	8	1548 18.000
20.000	10.000	70.000	30.000	25.000	8	1548 20.000
22.000	10.000	70.000	30.000	25.000	8	1548 22.000
24.000	12.000	75.000	30.000	25.000	8	1548 24.000
25.000	12.000	75.000	30.000	25.000	8	1548 25.000
26.000	12.000	75.000	30.000	25.000	8	1548 26.000
28.000	12.000	75.000	30.000	25.000	8	1548 28.000
30.000	16.000	78.000	30.000	25.000	8	1548 30.000
32.000	16.000	78.000	30.000	25.000	8	1548 32.000
34.000	20.000	80.000	30.000	25.000	8	1548 34.000
36.000	20.000	80.000	30.000	25.000	8	1548 36.000
38.000	20.000	80.000	30.000	25.000	8	1548 38.000
40.000	20.000	80.000	30.000	25.000	8	1548 40.000
42.000	20.000	80.000	30.000	25.000	8	1548 42.000

High-performance reamers

WN | HA | R | H7 | EU | 65 HRC

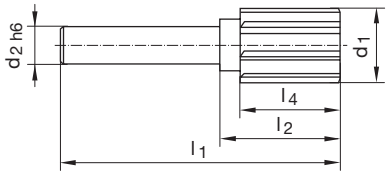
P	•
M	•
K	○
N	
S	•
H	•

- for clamping in hydraulic and shrink fit chucks
- for extension, shrink extensions e.g. art. no. 4719 are recommended

Tool material	**Solid carbide**
Surface	a
Form	
Type	HR 500 TD

GÜHRINGNAVIGATOR

Cutting data page 428





Article no.	1549

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
14.000	6.000	66.000	30.000	25.000	8	1549 14.000
15.000	6.000	66.000	30.000	25.000	8	1549 15.000
16.000	8.000	66.000	30.000	25.000	8	1549 16.000
18.000	8.000	66.000	30.000	25.000	8	1549 18.000
20.000	10.000	70.000	30.000	25.000	8	1549 20.000
22.000	10.000	70.000	30.000	25.000	8	1549 22.000
24.000	12.000	75.000	30.000	25.000	8	1549 24.000
25.000	12.000	75.000	30.000	25.000	8	1549 25.000
26.000	12.000	75.000	30.000	25.000	8	1549 26.000
28.000	12.000	75.000	30.000	25.000	8	1549 28.000
30.000	16.000	78.000	30.000	25.000	8	1549 30.000
32.000	16.000	78.000	30.000	25.000	8	1549 32.000
34.000	20.000	80.000	30.000	25.000	8	1549 34.000
36.000	20.000	80.000	30.000	25.000	8	1549 36.000
38.000	20.000	80.000	30.000	25.000	8	1549 38.000
40.000	20.000	80.000	30.000	25.000	8	1549 40.000
42.000	20.000	80.000	30.000	25.000	8	1549 42.000

High-performance reamers

WN | HA | R | H7 | EU | 48 HRC

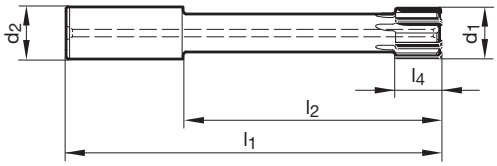
Tool material	Carbide
Surface	a
Form	
Type	HR 500 G S

P	•
M	•
K	•
N	○
S	○
H	○

- The carbide-tipped high-performance reamer is preferred for cast iron grades GG, GGG60-GG70,GGV and ADI.
- Carbide-tipped tools with Signum coating for machining of castings with the highest surface finish requirements can be obtained as special tools.

GÜHRINGNAVIGATOR

Cutting data page 428





Article no.	1680

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
22.000	20.000	160.000	110.000	22.000	6	1680 22.000
24.000	25.000	180.000	124.000	22.000	6	1680 24.000
25.000	25.000	180.000	124.000	22.000	6	1680 25.000
26.000	25.000	180.000	124.000	22.000	6	1680 26.000
28.000	25.000	180.000	124.000	25.000	6	1680 28.000
30.000	25.000	180.000	124.000	25.000	6	1680 30.000
32.000	32.000	200.000	140.000	25.000	6	1680 32.000
34.000	32.000	200.000	140.000	25.000	6	1680 34.000
36.000	32.000	200.000	140.000	25.000	8	1680 36.000
38.000	32.000	200.000	140.000	25.000	8	1680 38.000
40.000	32.000	200.000	140.000	25.000	8	1680 40.000

High-performance reamers

WN | HA | R | H7 | EU | 48 HRC

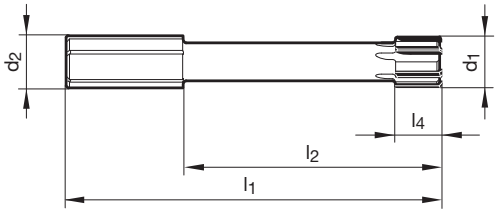
Tool material	**Carbide**
Surface	a
Form	
Type	HR 500 G D

P	•
M	•
K	•
N	○
S	○
H	○

- The carbide-tipped high-performance reamer is preferred for cast iron grades GG, GGG60-GG70,GGV and ADI.
- Carbide-tipped tools with Signum coating for machining of castings with the highest surface finish requirements can be obtained as special tools.

GÜHRINGNAVIGATOR

Cutting data page 428





Article no.	**1681**

d1	d2 h6	l1	l2	l4	Z	**Order no.**
mm	mm	mm	mm	mm		
22.000	20.000	160.000	110.000	22.000	6	1681 22.000
24.000	25.000	180.000	124.000	22.000	6	1681 24.000
25.000	25.000	180.000	124.000	22.000	6	1681 25.000
26.000	25.000	180.000	124.000	22.000	6	1681 26.000
28.000	25.000	180.000	124.000	25.000	6	1681 28.000
30.000	25.000	180.000	124.000	25.000	6	1681 30.000
32.000	32.000	200.000	140.000	25.000	6	1681 32.000
34.000	32.000	200.000	140.000	25.000	6	1681 34.000
36.000	32.000	200.000	140.000	25.000	8	1681 36.000
38.000	32.000	200.000	140.000	25.000	8	1681 38.000
40.000	32.000	200.000	140.000	25.000	8	1681 40.000

HR 500 T

the solid carbide head solution



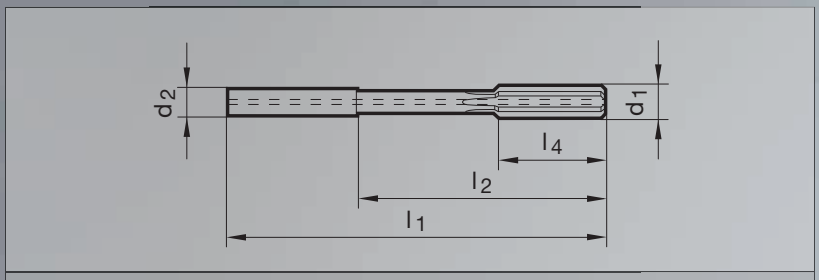
+ High-performance reamer for particularly cost-effective production

+ flexible mounting options thanks to rear axle shaft

+ easy extension with shrink extension or hydraulic expansion chuck

HR 500 XL

for reaming deep or sunken holes



HR 500 L & XL				
d1 (Nom.-Ø)	d2 (Shank-Ø)	l1 (Overall length)	l2 (Overhang length)	l4 (Cutting edge length)
4H7 - L	4h6	101	73	12.00
4H7 - XL	4h6	150	122	12.00
5H7 - L	6h6	101	65	12.00
5H7 - XL	6h6	150	114	12.00
6H7 - L	6h6	101	94	12.00
6H7 - XL	6h6	150	124	12.00
8H7 - L	8h6	130	94	16.00
8H7 - XL	8h6	200	164	16.00
10H7 - L	10h6	130	90	19.00
10H7 - XL	10h6	200	160	19.00
12H7 - L	12h6	160	115	19.00
12H7 - XL	12h6	200	155	19.00

+ longer versions also available on request



NC machine reamers

WN | HA | R | H7 | EU | 48 HRC

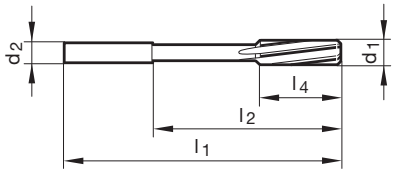
Tool material	Solid carbide
Surface	◯
Form	B
Type	

P	•
M	○
K	•
N	•
S	○
H	○

• > Ø 3.75 mm with extremely unequal flute spacing

GÜHRINGNAVIGATOR

Cutting data page 430





Article no.	6016

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
3.000	4.000	64.000	36.000	17.000	6	6016 3.000
3.500	4.000	74.000	46.000	20.000	6	6016 3.500
4.000	4.000	77.000	45.000	21.000	6	6016 4.000
4.500	6.000	82.000	50.000	23.000	6	6016 4.500
5.000	6.000	93.000	59.000	26.000	6	6016 5.000
5.500	6.000	93.000	57.000	26.000	6	6016 5.500
6.000	6.000	93.000	57.000	26.000	6	6016 6.000
6.500	8.000	101.000	63.000	28.000	6	6016 6.500
7.000	8.000	109.000	69.000	31.000	6	6016 7.000
7.500	8.000	109.000	69.000	31.000	6	6016 7.500
8.000	8.000	117.000	75.000	33.000	6	6016 8.000
8.500	10.000	117.000	75.000	33.000	6	6016 8.500
9.000	10.000	125.000	81.000	36.000	6	6016 9.000
9.500	10.000	125.000	81.000	36.000	6	6016 9.500
10.000	10.000	133.000	87.000	38.000	6	6016 10.000
10.500	10.000	133.000	87.000	38.000	6	6016 10.500
11.000	10.000	142.000	96.000	41.000	6	6016 11.000
11.500	10.000	142.000	96.000	41.000	6	6016 11.500
12.000	12.000	151.000	105.000	44.000	6	6016 12.000
13.000	14.000	160.000	114.000	44.000	6	6016 13.000
14.000	14.000	160.000	110.000	47.000	6	6016 14.000
15.000	16.000	170.000	120.000	50.000	6	6016 15.000
16.000	16.000	170.000	120.000	52.000	6	6016 16.000
17.000	18.000	182.000	130.000	52.000	6	6016 17.000
18.000	18.000	182.000	130.000	52.000	6	6016 18.000
19.000	20.000	195.000	137.000	52.000	6	6016 19.000
20.000	20.000	195.000	137.000	52.000	6	6016 20.000

NC machine reamers

WN | HA | R | H7 | EU | 55 HRC

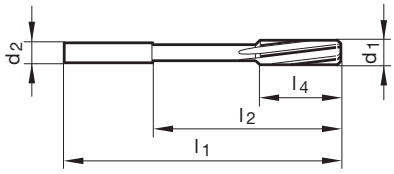
Tool material	**Solid carbide**
Surface	a
Form	B
Type	

P	•
M	•
K	•
N	
S	•
H	•

• > Ø 3.75 mm with extremely unequal flute spacing

GÜHRINGNAVIGATOR

Cutting data page 430





Article no. **6017**

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
3.000	4.000	64.000	36.000	17.000	6	6017 3.000
3.500	4.000	74.000	46.000	20.000	6	6017 3.500
4.000	4.000	77.000	45.000	21.000	6	6017 4.000
4.500	6.000	82.000	50.000	23.000	6	6017 4.500
5.000	6.000	93.000	59.000	26.000	6	6017 5.000
5.500	6.000	93.000	57.000	26.000	6	6017 5.500
6.000	6.000	93.000	57.000	26.000	6	6017 6.000
6.500	8.000	101.000	63.000	28.000	6	6017 6.500
7.000	8.000	109.000	69.000	31.000	6	6017 7.000
7.500	8.000	109.000	69.000	31.000	6	6017 7.500
8.000	8.000	117.000	75.000	33.000	6	6017 8.000
8.500	10.000	117.000	75.000	33.000	6	6017 8.500
9.000	10.000	125.000	81.000	36.000	6	6017 9.000
9.500	10.000	125.000	81.000	36.000	6	6017 9.500
10.000	10.000	133.000	87.000	38.000	6	6017 10.000
10.500	10.000	133.000	87.000	38.000	6	6017 10.500
11.000	10.000	142.000	96.000	41.000	6	6017 11.000
11.500	10.000	142.000	96.000	41.000	6	6017 11.500
12.000	12.000	151.000	105.000	44.000	6	6017 12.000
13.000	14.000	160.000	114.000	44.000	6	6017 13.000
14.000	14.000	160.000	110.000	47.000	6	6017 14.000
15.000	16.000	170.000	120.000	50.000	6	6017 15.000
16.000	16.000	170.000	120.000	52.000	6	6017 16.000
17.000	18.000	182.000	130.000	52.000	6	6017 17.000
18.000	18.000	182.000	130.000	52.000	6	6017 18.000
19.000	20.000	195.000	137.000	52.000	6	6017 19.000
20.000	20.000	195.000	137.000	52.000	6	6017 20.000

NC machine reamers

WN | HA | R | +0,004 +0,005 | EU | 48 HRC

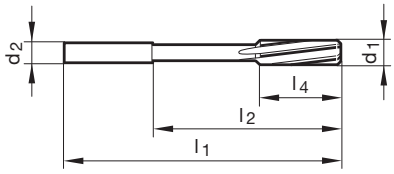
Tool material	Solid carbide
Surface	◯
Form	B
Type	

P	•
M	○
K	•
N	•
S	○
H	○

- > Ø 3.75 mm with extremely unequal flute spacing
- ≤ Ø 5.50 mm: 0.000/+0.004
- > Ø 5.50 mm: 0.000/+0.005

GÜHRINGNAVIGATOR

Cutting data page 430





Article no. **5527**

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
0.980	4.000	50.000	22.000	6.000	3	5527 0.980
0.990	4.000	50.000	22.000	6.000	3	5527 0.990
1.000	4.000	50.000	22.000	6.000	3	5527 1.000
1.010	4.000	50.000	22.000	6.000	3	5527 1.010
1.020	4.000	50.000	22.000	6.000	3	5527 1.020
1.030	4.000	50.000	22.000	9.000	3	5527 1.030
1.480	4.000	50.000	22.000	9.000	3	5527 1.480
1.490	4.000	50.000	22.000	9.000	3	5527 1.490
1.500	4.000	50.000	22.000	9.000	3	5527 1.500
1.510	4.000	50.000	22.000	9.000	3	5527 1.510
1.520	4.000	50.000	22.000	9.000	3	5527 1.520
1.530	4.000	50.000	22.000	9.000	3	5527 1.530
1.980	4.000	50.000	22.000	12.000	4	5527 1.980
1.990	4.000	50.000	22.000	12.000	4	5527 1.990
2.000	4.000	50.000	22.000	12.000	4	5527 2.000
2.010	4.000	50.000	22.000	12.000	4	5527 2.010
2.020	4.000	50.000	22.000	12.000	4	5527 2.020
2.030	4.000	50.000	22.000	12.000	4	5527 2.030
2.480	4.000	60.000	32.000	16.000	4	5527 2.480
2.490	4.000	60.000	32.000	16.000	4	5527 2.490
2.500	4.000	60.000	32.000	16.000	4	5527 2.500
2.510	4.000	60.000	32.000	16.000	4	5527 2.510
2.520	4.000	60.000	32.000	16.000	4	5527 2.520
2.530	4.000	60.000	32.000	16.000	4	5527 2.530
2.970	4.000	64.000	36.000	17.000	6	5527 2.970
2.980	4.000	64.000	36.000	17.000	6	5527 2.980
2.990	4.000	64.000	36.000	17.000	6	5527 2.990
3.000	4.000	64.000	36.000	17.000	6	5527 3.000
3.010	4.000	64.000	36.000	17.000	6	5527 3.010
3.020	4.000	64.000	36.000	17.000	6	5527 3.020
3.030	4.000	64.000	36.000	17.000	6	5527 3.030
3.970	4.000	77.000	45.000	21.000	6	5527 3.970
3.980	4.000	77.000	45.000	21.000	6	5527 3.980
3.990	4.000	77.000	45.000	21.000	6	5527 3.990
4.000	4.000	77.000	45.000	21.000	6	5527 4.000
4.010	4.000	77.000	45.000	21.000	6	5527 4.010

					Article no.	5527
d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
4.020	4.000	77.000	45.000	21.000	6	5527 4.020
4.030	4.000	77.000	45.000	21.000	6	5527 4.030
4.970	6.000	93.000	59.000	26.000	6	5527 4.970
4.980	6.000	93.000	59.000	26.000	6	5527 4.980
4.990	6.000	93.000	59.000	26.000	6	5527 4.990
5.000	6.000	93.000	59.000	26.000	6	5527 5.000
5.010	6.000	93.000	59.000	26.000	6	5527 5.010
5.020	6.000	93.000	59.000	26.000	6	5527 5.020
5.030	6.000	93.000	59.000	26.000	6	5527 5.030
5.970	6.000	93.000	57.000	26.000	6	5527 5.970
5.980	6.000	93.000	57.000	26.000	6	5527 5.980
5.990	6.000	93.000	57.000	26.000	6	5527 5.990
6.000	6.000	93.000	57.000	26.000	6	5527 6.000
6.010	6.000	93.000	57.000	26.000	6	5527 6.010
6.020	6.000	93.000	57.000	26.000	6	5527 6.020
6.030	6.000	93.000	57.000	26.000	6	5527 6.030
7.000	8.000	109.000	69.000	31.000	6	5527 7.000
7.970	8.000	117.000	75.000	33.000	6	5527 7.970
7.980	8.000	117.000	75.000	33.000	6	5527 7.980
7.990	8.000	117.000	75.000	33.000	6	5527 7.990
8.000	8.000	117.000	75.000	33.000	6	5527 8.000
8.010	8.000	117.000	75.000	33.000	6	5527 8.010
8.020	8.000	117.000	75.000	33.000	6	5527 8.020
8.030	8.000	117.000	75.000	33.000	6	5527 8.030
8.040	8.000	117.000	75.000	33.000	6	5527 8.040
9.000	10.000	125.000	81.000	36.000	6	5527 9.000
9.970	10.000	133.000	87.000	38.000	6	5527 9.970
9.980	10.000	133.000	87.000	38.000	6	5527 9.980
9.990	10.000	133.000	87.000	38.000	6	5527 9.990
10.000	10.000	133.000	87.000	38.000	6	5527 10.000
10.010	10.000	133.000	87.000	38.000	6	5527 10.010
10.020	10.000	133.000	87.000	38.000	6	5527 10.020
10.030	10.000	133.000	87.000	38.000	6	5527 10.030
10.040	10.000	133.000	87.000	38.000	6	5527 10.040
10.050	10.000	133.000	87.000	38.000	6	5527 10.050
11.970	12.000	151.000	105.000	44.000	6	5527 11.970
11.980	12.000	151.000	105.000	44.000	6	5527 11.980
11.990	12.000	151.000	105.000	44.000	6	5527 11.990
12.000	12.000	151.000	105.000	44.000	6	5527 12.000
12.010	12.000	151.000	105.000	44.000	6	5527 12.010
12.020	12.000	151.000	105.000	44.000	6	5527 12.020
12.030	12.000	151.000	105.000	44.000	6	5527 12.030
12.040	12.000	151.000	105.000	44.000	6	5527 12.040
12.050	12.000	151.000	105.000	44.000	6	5527 12.050

NC machine reamers

WN | HA | R | +0,004 +0,005 | EU | 55 HRC

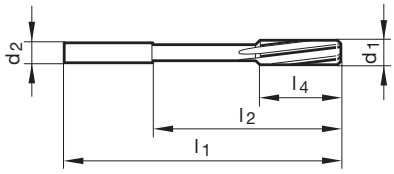
Tool material	Solid carbide
Surface	a
Form	B
Type	

P	•
M	•
K	•
N	
S	•
H	•

- > Ø 3.75 mm with extremely unequal flute spacing
- ≤ Ø 5.50 mm: 0.000/+0.004
- > Ø 5.50 mm: 0.000/+0.005

GÜHRINGNAVIGATOR

Cutting data page 430





Article no. **6018**

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
0.980	4.000	50.000	22.000	6.000	3	6018 0.980
0.990	4.000	50.000	22.000	6.000	3	6018 0.990
1.000	4.000	50.000	22.000	6.000	3	6018 1.000
1.010	4.000	50.000	22.000	6.000	3	6018 1.010
1.020	4.000	50.000	22.000	6.000	3	6018 1.020
1.030	4.000	50.000	22.000	9.000	3	6018 1.030
1.480	4.000	50.000	22.000	9.000	3	6018 1.480
1.490	4.000	50.000	22.000	9.000	3	6018 1.490
1.500	4.000	50.000	22.000	9.000	3	6018 1.500
1.510	4.000	50.000	22.000	9.000	3	6018 1.510
1.520	4.000	50.000	22.000	9.000	3	6018 1.520
1.530	4.000	50.000	22.000	9.000	3	6018 1.530
1.980	4.000	50.000	22.000	12.000	4	6018 1.980
1.990	4.000	50.000	22.000	12.000	4	6018 1.990
2.000	4.000	50.000	22.000	12.000	4	6018 2.000
2.010	4.000	50.000	22.000	12.000	4	6018 2.010
2.020	4.000	50.000	22.000	12.000	4	6018 2.020
2.030	4.000	50.000	22.000	12.000	4	6018 2.030
2.480	4.000	60.000	32.000	16.000	4	6018 2.480
2.490	4.000	60.000	32.000	16.000	4	6018 2.490
2.500	4.000	60.000	32.000	16.000	4	6018 2.500
2.510	4.000	60.000	32.000	16.000	4	6018 2.510
2.520	4.000	60.000	32.000	16.000	4	6018 2.520
2.530	4.000	60.000	32.000	16.000	4	6018 2.530
2.970	4.000	64.000	36.000	17.000	6	6018 2.970
2.980	4.000	64.000	36.000	17.000	6	6018 2.980
2.990	4.000	64.000	36.000	17.000	6	6018 2.990
3.000	4.000	64.000	36.000	17.000	6	6018 3.000
3.010	4.000	64.000	36.000	17.000	6	6018 3.010
3.020	4.000	64.000	36.000	17.000	6	6018 3.020
3.030	4.000	64.000	36.000	17.000	6	6018 3.030
3.970	4.000	77.000	45.000	21.000	6	6018 3.970
3.980	4.000	77.000	45.000	21.000	6	6018 3.980
3.990	4.000	77.000	45.000	21.000	6	6018 3.990
4.000	4.000	77.000	45.000	21.000	6	6018 4.000
4.010	4.000	77.000	45.000	21.000	6	6018 4.010

					Article no.	6018
d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
4.020	4.000	77.000	45.000	21.000	6	6018 4.020
4.030	4.000	77.000	45.000	21.000	6	6018 4.030
4.970	6.000	93.000	59.000	26.000	6	6018 4.970
4.980	6.000	93.000	59.000	26.000	6	6018 4.980
4.990	6.000	93.000	59.000	26.000	6	6018 4.990
5.000	6.000	93.000	59.000	26.000	6	6018 5.000
5.010	6.000	93.000	59.000	26.000	6	6018 5.010
5.020	6.000	93.000	59.000	26.000	6	6018 5.020
5.030	6.000	93.000	59.000	26.000	6	6018 5.030
5.970	6.000	93.000	57.000	26.000	6	6018 5.970
5.980	6.000	93.000	57.000	26.000	6	6018 5.980
5.990	6.000	93.000	57.000	26.000	6	6018 5.990
6.000	6.000	93.000	57.000	26.000	6	6018 6.000
6.010	6.000	93.000	57.000	26.000	6	6018 6.010
6.020	6.000	93.000	57.000	26.000	6	6018 6.020
6.030	6.000	93.000	57.000	26.000	6	6018 6.030
7.000	8.000	109.000	69.000	31.000	6	6018 7.000
7.970	8.000	117.000	75.000	33.000	6	6018 7.970
7.980	8.000	117.000	75.000	33.000	6	6018 7.980
7.990	8.000	117.000	75.000	33.000	6	6018 7.990
8.000	8.000	117.000	75.000	33.000	6	6018 8.000
8.010	8.000	117.000	75.000	33.000	6	6018 8.010
8.020	8.000	117.000	75.000	33.000	6	6018 8.020
8.030	8.000	117.000	75.000	33.000	6	6018 8.030
8.040	8.000	117.000	75.000	33.000	6	6018 8.040
9.000	10.000	125.000	81.000	36.000	6	6018 9.000
9.970	10.000	133.000	87.000	38.000	6	6018 9.970
9.980	10.000	133.000	87.000	38.000	6	6018 9.980
9.990	10.000	133.000	87.000	38.000	6	6018 9.990
10.000	10.000	133.000	87.000	38.000	6	6018 10.000
10.010	10.000	133.000	87.000	38.000	6	6018 10.010
10.020	10.000	133.000	87.000	38.000	6	6018 10.020
10.030	10.000	133.000	87.000	38.000	6	6018 10.030
10.040	10.000	133.000	87.000	38.000	6	6018 10.040
10.050	10.000	133.000	87.000	38.000	6	6018 10.050
11.970	12.000	151.000	105.000	44.000	6	6018 11.970
11.980	12.000	151.000	105.000	44.000	6	6018 11.980
11.990	12.000	151.000	105.000	44.000	6	6018 11.990
12.000	12.000	151.000	105.000	44.000	6	6018 12.000
12.010	12.000	151.000	105.000	44.000	6	6018 12.010
12.020	12.000	151.000	105.000	44.000	6	6018 12.020
12.030	12.000	151.000	105.000	44.000	6	6018 12.030
12.040	12.000	151.000	105.000	44.000	6	6018 12.040
12.050	12.000	151.000	105.000	44.000	6	6018 12.050

Machine reamers

~DIN 8094 | MK | R | H7 | EU | 48 HRC

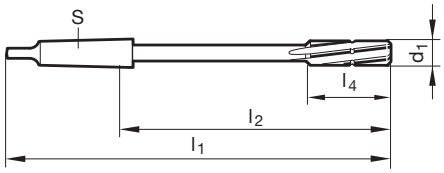
Tool material	Carbide
Surface	◯
Form	B
Type	

P	•
M	○
K	•
N	•
S	•
H	○

- ≤ Ø 9.50 mm: solid carbide
- > Ø 9.50 mm: carbide inserts
- allocation to company standard
- ≤ Ø 9.50 mm with external centre on cutting end
- internal centre on shank end
- > Ø 9.50 mm with internal centres on both ends

GÜHRINGNAVIGATOR

Cutting data page 430





Article no. **1411**

d1	S	l1	l2	l4	Z	Order no.
mm		mm	mm	mm		
5.000	MK-1	133.000	67.500	23.000	6	1411 5.000
6.000	MK-1	138.000	72.500	26.000	6	1411 6.000
7.000	MK-1	150.000	84.500	31.000	6	1411 7.000
8.000	MK-1	156.000	90.500	33.000	6	1411 8.000
9.000	MK-1	162.000	96.500	36.000	6	1411 9.000
10.000	MK-1	168.000	102.500	38.000	6	1411 10.000
11.000	MK-1	175.000	109.500	41.000	6	1411 11.000
12.000	MK-1	182.000	116.500	44.000	6	1411 12.000
13.000	MK-1	182.000	116.500	44.000	6	1411 13.000
14.000	MK-1	189.000	123.500	47.000	6	1411 14.000
15.000	MK-2	204.000	124.000	50.000	6	1411 15.000
16.000	MK-2	210.000	130.000	52.000	6	1411 16.000
17.000	MK-2	214.000	134.000	54.000	6	1411 17.000
18.000	MK-2	219.000	139.000	56.000	6	1411 18.000
19.000	MK-2	223.000	143.000	58.000	6	1411 19.000
20.000	MK-2	228.000	148.000	60.000	6	1411 20.000
21.000	MK-2	232.000	152.000	62.000	6	1411 21.000
22.000	MK-2	237.000	157.000	64.000	6	1411 22.000
23.000	MK-2	241.000	161.000	66.000	6	1411 23.000
24.000	MK-3	268.000	169.000	68.000	8	1411 24.000
25.000	MK-3	268.000	169.000	68.000	8	1411 25.000
26.000	MK-3	273.000	174.000	70.000	8	1411 26.000
27.000	MK-3	277.000	178.000	71.000	8	1411 27.000
28.000	MK-3	277.000	178.000	71.000	8	1411 28.000
30.000	MK-3	281.000	182.000	73.000	8	1411 30.000
34.000	MK-4	321.000	197.000	78.000	8	1411 34.000
35.000	MK-4	321.000	197.000	78.000	8	1411 35.000
36.000	MK-4	325.000	201.000	79.000	8	1411 36.000
40.000	MK-4	329.000	205.000	81.000	8	1411 40.000

NC machine reamers

DIN 212-3 | HA | R | H7 | ≠

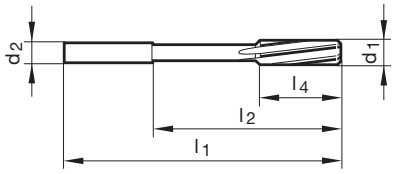
Tool material	HSS-E
Surface	◯
Form	B
Type	

P	•
M	○
K	•
N	•
S	○
H	

- ≤ Ø 3.75 mm with external centres on both ends
- > Ø 3.75 mm with internal centres on both ends

GÜHRINGNAVIGATOR

Cutting data page 430





Article no.	6019

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
1.500	2.000	40.000	12.000	8.000	3	6019 1.500
2.000	2.000	49.000	21.000	11.000	4	6019 2.000
2.500	3.000	57.000	27.000	14.000	4	6019 2.500
3.000	3.000	61.000	31.000	15.000	6	6019 3.000
3.500	4.000	70.000	38.000	18.000	6	6019 3.500
4.000	4.000	75.000	43.000	19.000	6	6019 4.000
4.500	5.000	80.000	47.000	21.000	6	6019 4.500
5.000	5.000	86.000	52.000	23.000	6	6019 5.000
5.500	6.000	93.000	57.000	26.000	6	6019 5.500
6.000	6.000	93.000	57.000	26.000	6	6019 6.000
6.500	6.000	101.000	63.000	28.000	6	6019 6.500
7.000	8.000	109.000	69.000	31.000	6	6019 7.000
7.500	8.000	109.000	69.000	31.000	6	6019 7.500
8.000	8.000	117.000	75.000	33.000	6	6019 8.000
8.500	8.000	117.000	75.000	33.000	6	6019 8.500
9.000	10.000	125.000	81.000	36.000	6	6019 9.000
9.500	10.000	125.000	81.000	36.000	6	6019 9.500
10.000	10.000	133.000	87.000	38.000	6	6019 10.000
11.000	10.000	142.000	96.000	41.000	6	6019 11.000
12.000	10.000	151.000	105.000	44.000	6	6019 12.000
13.000	10.000	151.000	105.000	44.000	6	6019 13.000
14.000	14.000	160.000	110.000	47.000	8	6019 14.000
15.000	14.000	162.000	112.000	50.000	8	6019 15.000
16.000	14.000	170.000	120.000	52.000	8	6019 16.000
17.000	14.000	175.000	123.000	54.000	8	6019 17.000
18.000	14.000	182.000	130.000	56.000	8	6019 18.000
19.000	16.000	189.000	131.000	58.000	8	6019 19.000
20.000	16.000	195.000	137.000	60.000	8	6019 20.000

NC machine reamers

DIN 212-3 | HA | R | +0,004 +0,005 | ≠

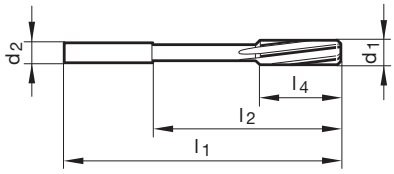
Tool material	HSS-E
Surface	◯
Form	B
Type	

P	•
M	○
K	•
N	•
S	○
H	

- ≤ Ø 3.75 mm with external centres on both ends
- > Ø 3.75 mm with internal centres on both ends
- ≤ Ø 5.50 mm: 0.000/+0.004
- > Ø 5.50 mm: 0.000/+0.005

GÜHRINGNAVIGATOR

Cutting data page 430





Article no.	6020

d1	d2 h6	l1	l2	l4	Z	Order no.
mm	mm	mm	mm	mm		
1.000	1.000	34.000	6.500	5.500	3	6020 1.000
1.010	1.000	34.000	6.500	5.500	3	6020 1.010
1.020	1.000	34.000	6.500	5.500	3	6020 1.020
1.030	1.000	34.000	6.500	5.500	3	6020 1.030
1.500	2.000	40.000	12.000	8.000	3	6020 1.500
1.510	2.000	43.000	15.000	9.000	3	6020 1.510
1.520	2.000	43.000	15.000	9.000	3	6020 1.520
1.530	2.000	43.000	15.000	9.000	3	6020 1.530
1.970	2.000	49.000	21.000	11.000	4	6020 1.970
1.980	2.000	49.000	21.000	11.000	4	6020 1.980
1.990	2.000	49.000	21.000	11.000	4	6020 1.990
2.000	2.000	49.000	21.000	11.000	4	6020 2.000
2.010	2.000	49.000	21.000	11.000	4	6020 2.010
2.020	2.000	49.000	21.000	11.000	4	6020 2.020
2.030	2.000	49.000	21.000	11.000	4	6020 2.030
2.470	3.000	57.000	27.000	14.000	4	6020 2.470
2.480	3.000	57.000	27.000	14.000	4	6020 2.480
2.490	3.000	57.000	27.000	14.000	4	6020 2.490
2.500	3.000	57.000	27.000	14.000	4	6020 2.500
2.510	3.000	57.000	27.000	14.000	4	6020 2.510
2.520	3.000	57.000	27.000	14.000	4	6020 2.520
2.530	3.000	57.000	27.000	14.000	4	6020 2.530
2.970	3.000	61.000	31.000	15.000	6	6020 2.970
2.980	3.000	61.000	31.000	15.000	6	6020 2.980
2.990	3.000	61.000	31.000	15.000	6	6020 2.990
3.000	3.000	61.000	31.000	15.000	6	6020 3.000
3.010	4.000	65.000	34.000	16.000	6	6020 3.010
3.020	4.000	65.000	34.000	16.000	6	6020 3.020
3.030	4.000	65.000	34.000	16.000	6	6020 3.030
3.970	4.000	75.000	43.000	19.000	6	6020 3.970
3.980	4.000	75.000	43.000	19.000	6	6020 3.980
3.990	4.000	75.000	43.000	19.000	6	6020 3.990
4.000	4.000	75.000	43.000	19.000	6	6020 4.000
4.010	4.000	75.000	43.000	19.000	6	6020 4.010
4.020	4.000	75.000	43.000	19.000	6	6020 4.020
4.030	4.000	75.000	43.000	19.000	6	6020 4.030

						Article no.	6020
d1	d2 h6	l1	l2	l4	Z	Order no.	
mm	mm	mm	mm	mm			
4.970	5.000	86.000	52.000	23.000	6	6020 4.970	
4.980	5.000	86.000	52.000	23.000	6	6020 4.980	
4.990	5.000	86.000	52.000	23.000	6	6020 4.990	
5.000	5.000	86.000	52.000	23.000	6	6020 5.000	
5.010	5.000	86.000	52.000	23.000	6	6020 5.010	
5.020	5.000	86.000	52.000	23.000	6	6020 5.020	
5.030	5.000	86.000	52.000	23.000	6	6020 5.030	
5.970	6.000	93.000	57.000	26.000	6	6020 5.970	
5.980	6.000	93.000	57.000	26.000	6	6020 5.980	
5.990	6.000	93.000	57.000	26.000	6	6020 5.990	
6.000	6.000	93.000	57.000	26.000	6	6020 6.000	
6.010	6.000	101.000	63.000	28.000	6	6020 6.010	
6.020	6.000	101.000	63.000	28.000	6	6020 6.020	
6.030	6.000	101.000	63.000	28.000	6	6020 6.030	
7.970	8.000	117.000	75.000	33.000	6	6020 7.970	
7.980	8.000	117.000	75.000	33.000	6	6020 7.980	
7.990	8.000	117.000	75.000	33.000	6	6020 7.990	
8.000	8.000	117.000	75.000	33.000	6	6020 8.000	
8.010	8.000	117.000	75.000	33.000	6	6020 8.010	
8.020	8.000	117.000	75.000	33.000	6	6020 8.020	
8.030	8.000	117.000	75.000	33.000	6	6020 8.030	
9.000	10.000	125.000	81.000	36.000	6	6020 9.000	
9.010	10.000	125.000	81.000	36.000	6	6020 9.010	
9.020	10.000	125.000	81.000	36.000	6	6020 9.020	
9.030	10.000	125.000	81.000	36.000	6	6020 9.030	
9.970	10.000	133.000	87.000	38.000	6	6020 9.970	
9.980	10.000	133.000	87.000	38.000	6	6020 9.980	
9.990	10.000	133.000	87.000	38.000	6	6020 9.990	
10.000	10.000	133.000	87.000	38.000	6	6020 10.000	
10.010	10.000	133.000	87.000	38.000	6	6020 10.010	
10.020	10.000	133.000	87.000	38.000	6	6020 10.020	
10.030	10.000	133.000	87.000	38.000	6	6020 10.030	
11.970	10.000	151.000	105.000	44.000	6	6020 11.970	
11.980	10.000	151.000	105.000	44.000	6	6020 11.980	
11.990	10.000	151.000	105.000	44.000	6	6020 11.990	
12.000	10.000	151.000	105.000	44.000	6	6020 12.000	
12.010	10.000	151.000	105.000	44.000	6	6020 12.010	
12.020	10.000	151.000	105.000	44.000	6	6020 12.020	
12.030	10.000	151.000	105.000	44.000	6	6020 12.030	

Machine reamers

DIN 208 | MK | R | H7 | ≠

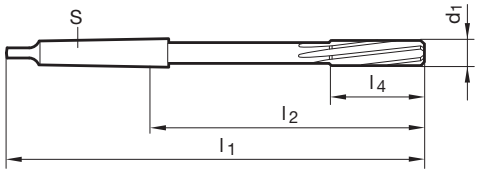
Tool material	HSS-E
Surface	◯
Form	B
Type	

P	•
M	○
K	•
N	•
S	•
H	

- > Ø 3.00 mm with internal centres on both ends
- Ø 3.00 mm with external centre on cutting end, with internal centre on shank end
- ≤ Ø 4.00 mm to company standard

GÜHRINGNAVIGATOR

Cutting data page 430





Article no. **405**

d1	S	l1	l2	l4	Z	Order no.
mm		mm	mm	mm		
3.000	MK-1	115.000	49.500	15.000	6	405 3.000
4.000	MK-1	125.000	59.500	19.000	6	405 4.000
5.000	MK-1	133.000	67.500	23.000	6	405 5.000
6.000	MK-1	138.000	72.500	26.000	6	405 6.000
7.000	MK-1	150.000	84.500	31.000	6	405 7.000
8.000	MK-1	156.000	90.500	33.000	6	405 8.000
9.000	MK-1	162.000	96.500	36.000	6	405 9.000
10.000	MK-1	168.000	102.500	38.000	6	405 10.000
11.000	MK-1	175.000	109.500	41.000	6	405 11.000
12.000	MK-1	182.000	116.500	44.000	6	405 12.000
13.000	MK-1	182.000	116.500	44.000	6	405 13.000
14.000	MK-1	189.000	123.500	47.000	8	405 14.000
15.000	MK-2	204.000	124.000	50.000	8	405 15.000
16.000	MK-2	210.000	130.000	52.000	8	405 16.000
17.000	MK-2	214.000	134.000	54.000	8	405 17.000
18.000	MK-2	219.000	139.000	56.000	8	405 18.000
19.000	MK-2	223.000	143.000	58.000	8	405 19.000
20.000	MK-2	228.000	148.000	60.000	8	405 20.000
21.000	MK-2	232.000	152.000	62.000	8	405 21.000
22.000	MK-2	237.000	157.000	64.000	8	405 22.000
23.000	MK-2	241.000	161.000	66.000	8	405 23.000
24.000	MK-3	268.000	169.000	68.000	8	405 24.000
25.000	MK-3	268.000	169.000	68.000	8	405 25.000
26.000	MK-3	273.000	174.000	70.000	8	405 26.000
27.000	MK-3	277.000	178.000	71.000	10	405 27.000
28.000	MK-3	277.000	178.000	71.000	10	405 28.000
29.000	MK-3	281.000	182.000	73.000	10	405 29.000
30.000	MK-3	281.000	182.000	73.000	10	405 30.000
31.000	MK-3	285.000	186.000	75.000	10	405 31.000
32.000	MK-4	317.000	193.000	77.000	10	405 32.000
33.000	MK-4	317.000	193.000	77.000	10	405 33.000
34.000	MK-4	321.000	197.000	78.000	10	405 34.000
35.000	MK-4	321.000	197.000	78.000	10	405 35.000
36.000	MK-4	325.000	201.000	79.000	10	405 36.000
37.000	MK-4	325.000	201.000	79.000	10	405 37.000
38.000	MK-4	329.000	205.000	81.000	10	405 38.000

						Article no.	405
d1	S	l1	l2	l4	Z	**Order no.**	
mm		mm	mm	mm			
40.000	MK-4	329.000	205.000	81.000	10	405 40.000	
42.000	MK-4	333.000	209.000	82.000	12	405 42.000	
44.000	MK-4	336.000	212.000	83.000	12	405 44.000	
45.000	MK-4	336.000	212.000	83.000	12	405 45.000	
46.000	MK-4	340.000	216.000	84.000	12	405 46.000	
47.000	MK-4	340.000	216.000	84.000	12	405 47.000	
48.000	MK-4	344.000	220.000	86.000	12	405 48.000	
50.000	MK-4	344.000	220.000	86.000	12	405 50.000	

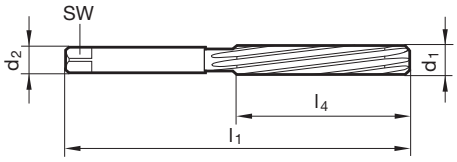
Hand reamers

DIN 206 | Cyl | R | H7 | ≠

Tool material	HSS
Surface	◯
Form	B
Type	

P	•
M	
K	•
N	•
S	
H	

- > Ø 3.75 mm with internal centres on both ends
- with square to DIN 10
- ≤ Ø 3.75 mm with external centres on both ends
- ≤ 1.75 mm to company standard





Article no. **413**

d1	d2	l1	l4	SW	Z	Order no.
mm	mm	mm	mm	mm		
1.000	1.000	34.000	13.000		3	413 1.000
1.400	1.400	41.000	20.000	1.120	3	413 1.400
1.500	1.500	41.000	20.000	1.120	3	413 1.500
1.600	1.600	44.000	21.000	1.250	3	413 1.600
2.000	2.000	50.000	25.000	1.600	4	413 2.000
2.200	2.200	54.000	27.000	1.800	4	413 2.200
2.500	2.500	58.000	29.000	2.100	4	413 2.500
2.800	2.800	62.000	31.000	2.100	6	413 2.800
3.000	3.000	62.000	31.000	2.400	6	413 3.000
3.200	3.200	66.000	33.000	2.400	6	413 3.200
3.500	3.500	71.000	35.000	2.700	6	413 3.500
4.000	4.000	76.000	38.000	3.000	6	413 4.000
4.500	4.500	81.000	41.000	3.400	6	413 4.500
5.000	5.000	87.000	44.000	3.800	6	413 5.000
5.500	5.500	93.000	47.000	4.300	6	413 5.500
6.000	6.000	93.000	47.000	4.900	6	413 6.000
6.500	6.500	100.000	50.000	4.900	6	413 6.500
7.000	7.000	107.000	54.000	5.500	6	413 7.000
7.500	7.500	107.000	54.000	6.200	6	413 7.500
8.000	8.000	115.000	58.000	6.200	6	413 8.000
8.500	8.500	115.000	58.000	7.000	6	413 8.500
9.000	9.000	124.000	62.000	7.000	6	413 9.000
9.500	9.500	124.000	62.000	8.000	6	413 9.500
10.000	10.000	133.000	66.000	8.000	6	413 10.000
10.500	10.500	133.000	66.000	8.000	6	413 10.500
11.000	11.000	142.000	71.000	9.000	6	413 11.000
11.500	11.500	142.000	71.000	9.000	6	413 11.500
12.000	12.000	152.000	76.000	9.000	6	413 12.000
12.500	12.500	152.000	76.000	10.000	6	413 12.500
13.000	13.000	152.000	76.000	10.000	6	413 13.000
13.500	13.500	163.000	81.000	11.000	8	413 13.500
14.000	14.000	163.000	81.000	11.000	8	413 14.000
14.500	14.500	163.000	81.000	11.000	8	413 14.500
15.000	15.000	163.000	81.000	12.000	8	413 15.000
15.500	15.500	175.000	87.000	12.000	8	413 15.500
16.000	16.000	175.000	87.000	12.000	8	413 16.000

						Article no.	413
d1	d2	l1	l4	SW	Z	**Order no.**	
mm	mm	mm	mm	mm			
16.500	16.500	175.000	87.000	13.000	8	413 16.500	
17.000	17.000	175.000	87.000	13.000	8	413 17.000	
17.500	17.500	188.000	93.000	14.500	8	413 17.500	
18.000	18.000	188.000	93.000	14.500	8	413 18.000	
18.500	18.500	188.000	93.000	14.500	8	413 18.500	
19.000	19.000	188.000	93.000	14.500	8	413 19.000	
19.500	19.500	201.000	100.000	16.000	8	413 19.500	
20.000	20.000	201.000	100.000	16.000	8	413 20.000	
21.000	21.000	201.000	100.000	16.000	8	413 21.000	
22.000	22.000	215.000	107.000	18.000	8	413 22.000	
23.000	23.000	215.000	107.000	18.000	8	413 23.000	
24.000	24.000	231.000	115.000	18.000	8	413 24.000	
25.000	25.000	231.000	115.000	20.000	8	413 25.000	
26.000	26.000	231.000	115.000	20.000	8	413 26.000	
28.000	28.000	247.000	124.000	22.000	10	413 28.000	
30.000	30.000	247.000	124.000	24.000	10	413 30.000	
31.000	31.000	265.000	133.000	24.000	10	413 31.000	
32.000	32.000	265.000	133.000	24.000	10	413 32.000	
33.000	33.000	265.000	133.000	26.000	10	413 33.000	
34.000	34.000	284.000	142.000	26.000	10	413 34.000	
35.000	35.000	284.000	142.000	29.000	10	413 35.000	
37.000	37.000	284.000	142.000	29.000	10	413 37.000	
38.000	38.000	305.000	152.000	29.000	10	413 38.000	
39.000	39.000	305.000	152.000	32.000	10	413 39.000	
40.000	40.000	305.000	152.000	32.000	10	413 40.000	
41.000	41.000	305.000	152.000	32.000	12	413 41.000	
43.000	43.000	326.000	163.000	35.000	12	413 43.000	
44.000	44.000	326.000	163.000	35.000	12	413 44.000	
45.000	45.000	326.000	163.000	35.000	12	413 45.000	
48.000	48.000	347.000	174.000	39.000	12	413 48.000	
60.000	60.000	367.000	184.000	49.000	12	413 60.000	

SpyroTec

Countersinks with convex cutting edges



+ round, precise and chatter-free countersinking

+ significantly reduced cutting forces

+ convenient countersinking also possible with handheld drills

+ large selection of countersink angles, lengths and shank versions

90° Countersinks, spiral-fluted

DIN 335 | 90° | C

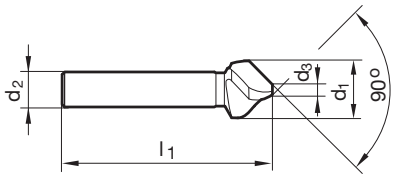
Tool material	HSCO
Surface	A
Shank form	cyl.

P	•
M	•
K	•
N	○
S	○
H	

- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

GÜHRINGNAVIGATOR

Cutting data page 433





Article no. **5500**

d1	d2	d3	l1	Z	Order no.
mm	mm	mm	mm		
6.300	5.000	1.500	45.000	3	5500 6.300
8.000	6.000	2.000	50.000	3	5500 8.000
8.300	6.000	2.000	50.000	3	5500 8.300
10.000	6.000	2.500	50.000	3	5500 10.000
10.400	6.000	2.500	50.000	3	5500 10.400
11.500	8.000	2.800	56.000	3	5500 11.500
12.400	8.000	2.800	56.000	3	5500 12.400
15.000	10.000	3.200	60.000	3	5500 15.000
16.500	10.000	3.200	60.000	3	5500 16.500
19.000	10.000	3.500	63.000	3	5500 19.000
20.500	10.000	3.500	63.000	3	5500 20.500
23.000	10.000	3.800	67.000	3	5500 23.000
25.000	10.000	3.800	67.000	3	5500 25.000
31.000	12.000	4.200	71.000	3	5500 31.000
40.000	12.000	10.000	75.000	3	5500 40.000

90° Countersinks, spiral-fluted

DIN 335 | 90° | C

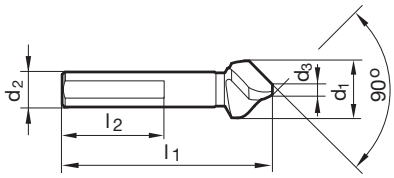
Tool material	HSCO
Surface	A
Shank form	3-flats

P	•
M	•
K	•
N	○
S	○
H	

- 3 different convex cutting edges
- 3-flats on shank prevent slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

GÜHRINGNAVIGATOR

Cutting data page 433





Article no. **5501**

d1	d2	d3	l1	l2	Z	Order no.
mm	mm	mm	mm	mm		
6.300	5.000	1.500	45.000	30.000	3	5501 6.300
8.000	6.000	2.000	50.000	30.000	3	5501 8.000
8.300	6.000	2.000	50.000	30.000	3	5501 8.300
10.000	6.000	2.500	50.000	30.000	3	5501 10.000
10.400	6.000	2.500	50.000	30.000	3	5501 10.400
11.500	8.000	2.800	56.000	30.000	3	5501 11.500
12.400	8.000	2.800	56.000	30.000	3	5501 12.400
15.000	10.000	3.200	60.000	30.000	3	5501 15.000
16.500	10.000	3.200	60.000	30.000	3	5501 16.500
19.000	10.000	3.500	63.000	30.000	3	5501 19.000
20.500	10.000	3.500	63.000	30.000	3	5501 20.500
23.000	10.000	3.800	67.000	30.000	3	5501 23.000
25.000	10.000	3.800	67.000	30.000	3	5501 25.000
31.000	12.000	4.200	71.000	30.000	3	5501 31.000
40.000	12.000	10.000	75.000	30.000	3	5501 40.000

90° Countersinks, spiral-fluted

WN | 90° | C

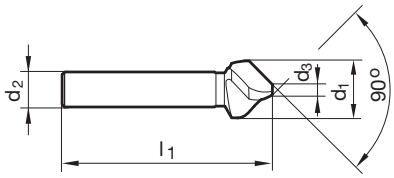
Tool material	HSS
Surface	A
Shank form	cyl.

P	•
M	○
K	•
N	○
S	○
H	

- long version for recessed machining points
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

GÜHRINGNAVIGATOR

Cutting data page 433





Article no. **5503**

d1	d2	d3	l1	Z	Order no.
mm	mm	mm	mm		
6.300	5.000	1.500	104.000	3	5503 6.300
8.300	6.000	2.000	105.000	3	5503 8.300
10.400	6.000	2.500	107.000	3	5503 10.400
12.400	8.000	2.800	108.000	3	5503 12.400
16.500	10.000	3.200	111.000	3	5503 16.500
20.500	10.000	3.500	114.000	3	5503 20.500
25.000	10.000	3.800	118.000	3	5503 25.000
31.000	12.000	4.200	140.000	3	5503 31.000

90° Countersink sets, spiral-fluted

DIN 335 | 90° | C

Tool material	HSCO
Surface	A
Shank form	cyl.

P	•
M	•
K	•
N	○
S	○
H	

- consisting of art. no. 5500
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application



GÜHRINGNAVIGATOR

Cutting data page 433

Article no. **5538**

Ø-range mm	Pieces/set	Order no.
6.3/8.3/10.4/12.4/16.5/20.5	6	5538 1.000
6.3/10.4/16.5/20.5/25.0	5	5538 2.000

90° Countersink sets, spiral-fluted

DIN 335 | 90° | C

Tool material	HSCO
Surface	A
Shank form	3-flats

P	•
M	•
K	•
N	○
S	○
H	

- consisting of art. no. 5501
- 3 different convex cutting edges
- 3-flats on shank prevent slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application



GÜHRINGNAVIGATOR

Cutting data page 433

Article no. **5539**

Ø-range	Pieces/set	**Order no.**
mm		
6.3/8.3/10.4/12.4/16.5/20.5	6	5539 1.000
6.3/10.4/16.5/20.5/25.0	5	5539 2.000

60° Countersinks, spiral-fluted

DIN 334 | 60° | C

Tool material	HSS
Surface	A
Shank form	cyl.

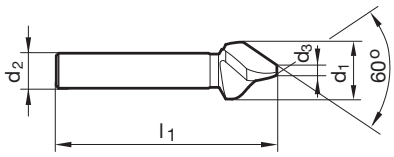
NEW

P	•
M	•
K	•
N	○
S	○
H	

- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

GÜHRINGNAVIGATOR

Cutting data page 435





Article no. **5670**

d1	d2	d3	l1	Z	Order no.
mm	mm	mm	mm		
6.300	5.000	1.600	45.000	3	5670 6.300
8.000	6.000	2.000	50.000	3	5670 8.000
10.000	6.000	3.200	56.000	3	5670 10.000
12.500	8.000	3.200	56.000	3	5670 12.500
16.000	10.000	4.000	63.000	3	5670 16.000
20.000	10.000	5.000	67.000	3	5670 20.000
25.000	10.000	6.300	71.000	3	5670 25.000

60° Countersinks, spiral-fluted

DIN 334 | 60° | C

Tool material	HSS
Surface	A
Shank form	3-flats

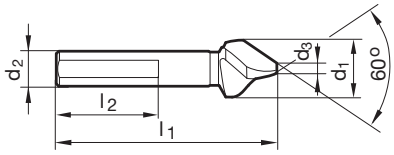
P	•
M	•
K	•
N	○
S	○
H	

- 3-flats on shank prevent slipping in the chuck
- 3 different convex cutting edges
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

NEW

GÜHRINGNAVIGATOR

Cutting data page 435





Article no. **5671**

d1	d2	d3	l1	l2	Z	Order no.
mm	mm	mm	mm	mm		
6.300	5.000	1.600	45.000	30.000	3	5671 6.300
8.000	6.000	2.000	50.000	30.000	3	5671 8.000
10.000	6.000	3.200	56.000	30.000	3	5671 10.000
12.500	8.000	3.200	56.000	30.000	3	5671 12.500
16.000	10.000	4.000	63.000	30.000	3	5671 16.000
20.000	10.000	5.000	67.000	30.000	3	5671 20.000
25.000	10.000	6.300	71.000	30.000	3	5671 25.000

60° Countersink sets, spiral-fluted

DIN 334 | 60° | C

Tool material	HSS
Surface	A
Shank form	cyl.

P	•
M	•
K	•
N	○
S	○
H	

- consisting of art. no. 5670
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

NEW



GÜHRINGNAVIGATOR

Cutting data page 435

Article no. **5672**

Ø-range	Pieces/set	Order no.
mm		
6.3/8.0/10.0/12.5/16.0/20.0	6	5672 1.000

60° Countersink sets, spiral-fluted

DIN 334 | 60° | C

Tool material	HSS
Surface	A
Shank form	3-flats

P	•
M	•
K	•
N	○
S	○
H	

- consisting of art. no. 5671
- 3 different convex cutting edges
- 3-flats on shank prevent slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

NEW



GÜHRINGNAVIGATOR

Cutting data page 435

Article no. **5673**

Ø-range	Pieces/set	**Order no.**
mm		
6.3/8.0/10.0/12.5/16.0/20.0	6	5673 1.000

82° Countersinks, spiral-fluted

WN | 82° | C

Tool material	HSCO
Surface	A
Shank form	cyl.

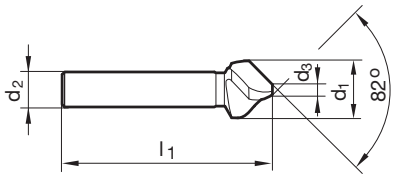
NEW

P	•
M	•
K	•
N	○
S	○
H	

- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

GÜHRINGNAVIGATOR

Cutting data page 437





Article no. **5674**

d1	d2	d3	l1	Z	Order no.
mm	mm	mm	mm		
6.350	6.350	1.520	50.800	3	5674 6.350
7.938	6.350	2.030	50.800	3	5674 7.938
9.525	6.350	2.290	50.800	3	5674 9.525
12.700	9.525	3.810	57.150	3	5674 12.700
15.875	9.525	4.570	57.150	3	5674 15.875
19.050	12.700	5.330	69.850	3	5674 19.050
22.225	12.700	5.840	69.850	3	5674 22.225
25.400	12.700	6.350	69.850	3	5674 25.400
31.750	12.700	9.400	76.200	3	5674 31.750

82° Countersinks, spiral-fluted

WN | 82° | C

Tool material	HSCO
Surface	A
Shank form	3-flats

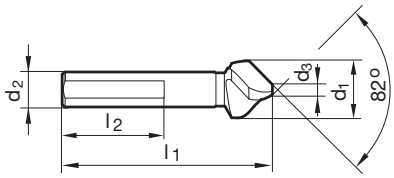
P	•
M	•
K	•
N	○
S	○
H	

- 3 different convex cutting edges
- 3-flats on shank prevent slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

NEW

GÜHRINGNAVIGATOR

Cutting data page 437





Article no. **5675**

d1	d2	d3	l1	l2	Z	Order no.
mm	mm	mm	mm	mm		
6.350	6.350	1.520	50.800	30.000	3	5675 6.350
7.938	6.350	2.030	50.800	30.000	3	5675 7.938
9.525	6.350	2.290	50.800	30.000	3	5675 9.525
12.700	9.525	3.810	57.150	30.000	3	5675 12.700
15.875	9.525	4.570	57.150	30.000	3	5675 15.875
19.050	12.700	5.330	69.850	30.000	3	5675 19.050
22.225	12.700	5.840	69.850	30.000	3	5675 22.225
25.400	12.700	6.350	69.850	30.000	3	5675 25.400
31.750	12.700	9.400	76.200	30.000	3	5675 31.750

82° Countersink sets, spiral-fluted

WN | 82° | C

Tool material	HSCO
Surface	A
Shank form	cyl.

NEW

P	•
M	•
K	•
N	○
S	○
H	

- consisting of art. no. 5674
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application



GÜHRINGNAVIGATOR

Cutting data page 437

Article no. **5676**

Ø-range	Pieces/set	Order no.
mm		
1/4, 5/16.3/8.1/2.5/8.3/4	6	5676 1.000

82° Countersink sets, spiral-fluted

WN | 82° | C

Tool material	HSCO
Surface	A
Shank form	3-flats

NEW

P	•
M	•
K	•
N	○
S	○
H	

- consisting of art. no. 5675
- 3 different convex cutting edges
- 3-flats on shank prevent slipping in the chuck
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application



GÜHRINGNAVIGATOR

Cutting data page 437

Article no. **5677**

Ø-range	Pieces/set	**Order no.**
mm		
1/4, 5/16.3/8.1/2.5/8.3/4	6	5677 1.000

GÜHRINGNAVIGATOR

Tools with bold feed column no. are preferred choice.
For blind holes with close diameter tolerances choose straight-fluted reamers.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the Gühring Navigator on the internet: www.guehring.com.

Article no. ®
Standard/DIN
Tool material
Surface
Type
Cooling
Std. range page

Tool Ø mm	Feed column no.						
	71	**72**	**73**	**74**	**75**	**76**	**77**
	f (mm/rev.)						
< 4.00	0.080	0.100	0.125	0.300	0.500	0.800	1.000
4.00	0.100	0.125	0.160	0.300	0.500	1.000	1.200
5.00	0.100	0.125	0.160	0.400	0.600	1.000	1.400
6.30	0.125	0.160	0.200	0.400	0.700	1.200	1.600
8.00	0.160	0.200	0.250	0.600	1.000	1.800	2.400
10.00	0.200	0.250	0.315	0.600	1.200	1.800	2.400
12.50	0.200	0.250	0.315	0.800	1.200	2.000	2.500
16.00	0.250	0.315	0.400	0.800	1.400	2.200	2.600
20.00	0.315	0.400	0.500	0.800	1.400	2.200	2.600
25.00	0.400	0.500	0.630	1.000	1.600	2.500	3.000
31.50	0.400	0.500	0.630	1.000	2.000	3.000	3.600
40.00	0.500	0.630	0.800	1.200	2.000	3.000	3.600
50.00	0.630	0.800	1.000	1.400	2.200	3.200	3.600
> 50.00	0.800	1.000	1.250	1.600	2.200	3.200	3.600

Coolant:
○ Air
● Neat oil
● Soluble oil

Cutting direction:
® right-hand cutting
Ⓛ left-hand cutting

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤65 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	●
Chilled cast iron	–		≤350 HB	●
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

High-performance reamers

1685/1675	1686/1676
Company std.	Company std.
Solid carbide	Solid carbide
a	a
HR 500 S	HR 500 D
axial	axial
388/390	389/392

1548	1549
Company std.	Company std.
Solid carbide	Solid carbide
a	a
HR 500 TS	HR 500 TD
axial	radial
394	395

1680	1681
Company std.	Company std.
Solid carbide	Solid carbide
a	a
HR 500 GS	HR 500 GD
axial	axial
396	397







v_c m/min	Feed col. no.	
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
60-120	75-76	75-76
30-60	73-74	73-74
40-60	73-74	73-74
30-60	73-74	73-74
60-120	74-75	74-75
40-80	74-75	74-75
60-120	74-75	74-75
60-140	75-76	75-76
60-140	75-76	75-76
120-250	74-75	74-75
60-120	74-75	74-75
30-50	74-75	74-75
80	75-76	75-76
80	75-76	75-76
40-60	74-75	74-75
40-60	74	74
40-60	74	74
80-160	75-76	75-76
100-250	75-76	75-76
100-250	75-76	75-76
100-250	75-76	75-76
80-200	75-76	75-76
80-200	75-76	75-76
80	71	71
80	71	71

v_c m/min	Feed col. no.	
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
120-250	75-76	75-76
60-120	75-76	75-76
30-60	73-74	73-74
40-60	73-74	73-74
30-60	73-74	73-74
60-120	74-75	74-75
40-80	74-75	74-75
60-120	74-75	74-75
60-140	75-76	75-76
60-140	75-76	75-76
120-250	74-75	74-75
60-120	74-75	74-75
30-50	74-75	74-75
80	75-76	75-76
80	75-76	75-76
40-60	74-75	74-75
40-60	74	74
40-60	74	74
80-160	75-76	75-76
100-250	75-76	75-76
100-250	75-76	75-76
100-250	75-76	75-76
80-200	75-76	75-76
80-200	75-76	75-76
80	71	71
80	71	71

v_c m/min	Feed col. no.	
25-40	74-75	74-75
25-40	74-75	74-75
25-40	74-75	74-75
25-40	74-75	74-75
25-40	74-75	74-75
25-40	74-75	74-75
25-40	74-75	74-75
25-40	74-75	74-75
25-40	74	74
25-40	74-75	74-75
25-40	74-75	74-75
25-40	74	74
25-40	74-75	74-75
25-40	74	74
25-40	74-75	74-75
25-40	74-75	74-75
20-30	74	74
20-30	74-75	74-75
10-20	72-73	72-73
30-60	74-75	74-75
20-30	74-75	74-75
20-30	74-75	74-75
40-100	75-76	75-76
40-100	75-76	75-76
50-120	75-76	75-76
50-100	75-76	75-76
20-40	74-75	74-75
60-80	74-75	74-75
40-80	74-75	74-75
20-30	73-74	73-74
20-40	73-74	73-74
20-40	73-74	73-74
80-160	75-76	75-76
40-120	74-75	74-75
50-120	74-75	74-75
50-120	74-75	74-75
40-120	74-75	74-75
40-120	74-75	74-75
80	71	71
80	71	71

GÜHRINGNAVIGATOR

Tools with bold feed column no. are preferred choice.
For blind holes with close diameter tolerances choose straight-fluted reamers.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the Gühring Navigator on the internet: www.guehring.com.

Article no. ®
Standard/DIN
Tool material
Carbide grade
Surface
Form
Std. range page

Tool Ø mm	Feed column no. 71	72	73	74	75	76	77
	f (mm/rev.)						
< 4.00	0.080	0.100	0.125	0.300	0.500	0.800	1.000
4.00	0.100	0.125	0.160	0.300	0.500	1.000	1.200
5.00	0.100	0.125	0.160	0.400	0.600	1.000	1.400
6.30	0.125	0.160	0.200	0.400	0.700	1.200	1.600
8.00	0.160	0.200	0.250	0.600	1.000	1.800	2.400
10.00	0.200	0.250	0.315	0.600	1.200	1.800	2.400
12.50	0.200	0.250	0.315	0.800	1.200	2.000	2.500
16.00	0.250	0.315	0.400	0.800	1.400	2.200	2.600
20.00	0.315	0.400	0.500	0.800	1.400	2.200	2.600
25.00	0.400	0.500	0.630	1.000	1.600	2.500	3.000
31.50	0.400	0.500	0.630	1.000	2.000	3.000	3.600
40.00	0.500	0.630	0.800	1.200	2.000	3.000	3.600
50.00	0.630	0.800	1.000	1.400	2.200	3.200	3.600
> 50.00	0.800	1.000	1.250	1.600	2.200	3.200	3.600

Coolant:
○ Air
● Neat oil
● Soluble oil

Cutting direction:
® right-hand cutting
Ⓛ left-hand cutting

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤65 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	●
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	●
Chilled cast iron	–		≤350 HB	●
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

NC reamers

Machine reamers

6019	6020	6016	5527	6017	6018	405	1411
212-3	212-3	Com. std.	Com. std.	Com. std.	Com. std.	208	~8094
HSS-E	HSS-E	Sol. carb.	Sol. carb.	Sol. carb.	Sol. carb.	HSS-E	Carbide
		K10	K10	K10/K20	K10/K20		
○	○	○	○	a	a	○	○
B	B	B	B	B	B	B	B
407	408	400	402	401	404	410	406











v_c m/min	Feed col. no.		v_c m/min	Feed col. no.		v_c m/min	Feed col. no.		v_c m/min	Feed col. no.	v_c m/min	Feed col. no.
16	72	72	18	72	72	20	73	73	16	72	18	72
12	72	72	16	72	72	18	73	73	12	72	16	72
12	72	72	18	72	72	20	73	73	12	72	18	72
10	71	71	16	72	72	18	73	73	10	71	16	72
14	72	72	18	71	71	20	72	72	14	72	18	71
12	71	71	16	72	72	18	72	72	12	71	16	72
10	71	71	14	71	71	15	72	72	10	71	14	71
10	71	71	14	71	71	15	72	72	10	71	14	71
8	71	71	12	71	71	13	71	71	8	71	12	71
16	72	72	18	71	71	20	73	73	16	72	18	71
10	71	71	14	71	71	15	72	72	10	71	14	71
8	71	71	12	71	71	13	72	72	8	71	12	71
10	71	71	14	71	71	15	71	71	10	71	14	71
8	71	71	12	71	71	13	71	71	8	71	12	71
14	72	72	12	71	71	13	71	71	14	72	12	71
10	71	71	10	71	71	11	71	71	10	71	10	71
10	71	71	10	71	71	11	71	71	10	71	10	71
						11	71	71				
			6	71	71	8	71	71				
6	72	72	8	71	71	9	71	71	6	72	8	71
6	72	72	6	71	71	7	71	71	6	72	6	71
4	72	72	6	71	71	7	71	71	4	72	6	71
14	71	71	20	71	71	22	73	73	14	71	20	71
12	71	71	18	71	71	20	73	73	12	71	18	71
12	71	71	20	71	71	22	73	73	12	71	20	71
10	71	71	18	71	71	20	73	73	10	71	18	71
						4	71	71				
8	71	71	16	71	71	16	71	71	8	71	16	71
8	71	71	16	71	71	16	71	71	8	71	16	71
			12	71	71							
			12	71	71							
4	71	71	6	71	71	7	71	71	4	71	6	71
6	71	71	10	71	71	11	71	71	6	71	10	71
4	71	71	10	71	71	11	71	71	4	71	10	71
18	73	73	30	73	73				18	73	30	73
18	73	73	30	73	73				18	73	30	73
20	72	72	40	72	72				20	72	40	72
18	72	72	30	72	72				18	72	30	72
20	72	72	25	72	72	28	73	73	20	72	25	72
18	72	72	25	72	72	28	73	73	18	72	25	72
18	72	72	35	72	72	39	73	73	18	72	35	72
16	72	72	30	72	72	33	73	73	16	72	30	72
20	72	72	35	72	72	39	73	73	20	72	35	72
18	72	72	30	72	72	33	73	73	18	72	30	72
18	72	72	30	72	72	33	73	73	18	72	30	72
14	72	72	25	72	72	28	73	73	14	72	25	72
12	73	73	20	73	73	22	73	73	12	73	20	73
14	73	73	20	73	73	22	73	73	14	73	20	73

GÜHRINGNAVIGATOR Spiral countersinks

Tools with bold feed column no. are preferred choice.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the Gühring Navigator on the internet: www.guehring.com.

Article no. ®
Standard/DIN
Tool material
Surface
Countersink angle
Shank form
Std. range page

Tool Ø mm	Feed column no.					
	81	**82**	**83**	**84**	**85**	**86**
	f (mm/rev.)					
2.00	0.03	0.04	0.06	0.08	0.10	0.13
2.50	0.03	0.05	0.07	0.10	0.13	0.16
3.15	0.03	0.05	0.08	0.11	0.15	0.20
4.00	0.04	0.06	0.09	0.13	0.17	0.22
5.00	0.04	0.07	0.10	0.14	0.18	0.23
6.30	0.04	0.07	0.12	0.15	0.19	0.24
8.00	0.05	0.08	0.13	0.16	0.20	0.25
10.00	0.06	0.09	0.14	0.17	0.22	0.26
12.50	0.06	0.10	0.15	0.19	0.23	0.28
16.00	0.07	0.11	0.17	0.21	0.26	0.31
20.00	0.08	0.13	0.18	0.23	0.28	0.33
25.00	0.09	0.15	0.21	0.26	0.30	0.38
31.50	0.12	0.17	0.24	0.30	0.36	0.42
40.00	0.14	0.21	0.28	0.34	0.40	0.46

Coolant:
○ Air
● Neat oil
● Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤65 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	○
Chilled cast iron	–		≤350 HB	○
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

5500	5538
DIN 335	DIN 335
HSCO	HSCO
A	A
90°	90°
cyl.	cyl.
415	418

5501	5539
DIN 335	DIN 335
HSCO	HSCO
A	A
90°	90°
3 surface	3 surface
416	419

5503
Company standard
HSS
A
90°
cyl.
417











v_c m/min	Feed col. no.		v_c m/min	Feed col. no.		v_c m/min	Feed col. no.
41	83	83	41	83	83	37	83
39	82	82	39	82	82	35	82
41	83	83	41	83	83	37	83
39	82	82	39	82	82	35	82
41	83	83	41	83	83	37	83
39	83	83	39	83	83	35	83
25	82	82	25	82	82	23	82
19	83	83	19	83	83	17	83
15	82	82	15	82	82	14	82
32	83	83	32	83	83	29	83
19	83	83	19	83	83	17	83
13	82	82	13	82	82	12	82
19	82	82	19	82	82	17	82
15	81	81	15	81	81	14	81
22	82	82	22	82	82	20	82
19	81	81	19	81	81	17	81
19	81	81	19	81	81	17	81
13	81	81	13	81	81	12	81
20	82	82	20	82	82	18	82
15	81	81	15	81	81	14	81
18	81	81	18	81	81	16	81
32	83	83	32	83	83	29	83
20	83	83	20	83	83	18	83
28	83	83	28	83	83	25	83
25	83	83	25	83	83	23	83
10	81	81	10	81	81	9	81
28	83	83	28	83	83	25	83
18	83	83	18	83	83	16	83
10	81	81	10	81	81	9	81
19	82	82	19	82	82	17	82
13	81	81	13	81	81	12	81
114	84	84	114	84	84	104	84
89	84	84	89	84	84	81	84
51	83	83	51	83	83	46	83
39	83	83	39	83	83	35	83
127	84	84	127	84	84	115	84
76	84	84	76	84	84	69	84
101	84	84	101	84	84	92	84
64	84	84	64	84	84	58	84
39	84	84	39	84	84	35	84
33	84	84	33	84	84	30	84
31	84	84	31	84	84	28	84
25	84	84	25	84	84	23	84
39	84	84	39	84	84	35	84
51	84	84	51	84	84	46	84

GÜHRINGNAVIGATOR Spiral countersinks

Tools with bold feed column no. are preferred choice.

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the Gühring Navigator on the internet: www.guehring.com.

Article no. ®
Standard/DIN
Tool material
Surface
Countersink angle
Shank form
Std. range page

Tool Ø mm	Feed column no.					
	81	82	83	84	85	86
	f (mm/rev.)					
2.00	0.03	0.04	0.06	0.08	0.10	0.13
2.50	0.03	0.05	0.07	0.10	0.13	0.16
3.15	0.03	0.05	0.08	0.11	0.15	0.20
4.00	0.04	0.06	0.09	0.13	0.17	0.22
5.00	0.04	0.07	0.10	0.14	0.18	0.23
6.30	0.04	0.07	0.12	0.15	0.19	0.24
8.00	0.05	0.08	0.13	0.16	0.20	0.25
10.00	0.06	0.09	0.14	0.17	0.22	0.26
12.50	0.06	0.10	0.15	0.19	0.23	0.28
16.00	0.07	0.11	0.17	0.21	0.26	0.31
20.00	0.08	0.13	0.18	0.23	0.28	0.33
25.00	0.09	0.15	0.21	0.26	0.30	0.38
31.50	0.12	0.17	0.24	0.30	0.36	0.42
40.00	0.14	0.21	0.28	0.34	0.40	0.46

Coolant:
○ Air
● Neat oil
● Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤65 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	○
Chilled cast iron	–		≤350 HB	○
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

5670	5672
DIN 334	DIN 334
HSS	HSS
A	A
60°	60°
cyl.	cyl.
420	422

5671	5673
DIN 334	DIN 334
HSS	HSS
A	A
60°	60°
3 surface	3 surface
421	423









v_c m/min	Feed col. no.	
37	83	83
35	82	82
37	83	83
35	82	82
37	83	83
35	83	83
23	82	82
17	83	83
14	82	82
29	83	83
17	83	83
12	82	82
17	82	82
14	81	81
20	82	82
17	81	81
17	81	81
12	81	81
18	82	82
14	81	81
16	81	81
29	83	83
18	83	83
25	83	83
23	83	83
9	81	81
25	83	83
16	83	83
9	81	81
17	82	82
12	81	81
104	84	84
81	84	84
46	83	83
35	83	83
115	84	84
69	84	84
92	84	84
58	84	84
35	84	84
30	84	84
28	84	84
23	84	84
35	84	84
46	84	84

v_c m/min	Feed col. no.	
37	83	83
35	82	82
37	83	83
35	82	82
37	83	83
35	83	83
23	82	82
17	83	83
14	82	82
29	83	83
17	83	83
12	82	82
17	82	82
14	81	81
20	82	82
17	81	81
17	81	81
12	81	81
18	82	82
14	81	81
16	81	81
29	83	83
18	83	83
25	83	83
23	83	83
9	81	81
25	83	83
16	83	83
9	81	81
17	82	82
12	81	81
104	84	84
81	84	84
46	83	83
35	83	83
115	84	84
69	84	84
92	84	84
58	84	84
35	84	84
30	84	84
28	84	84
23	84	84
35	84	84
46	84	84

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Tools with bold feed column no. are preferred choice.

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Article no. ®
Standard/DIN
Tool material
Surface
Countersink angle
Shank form
Std. range page

Tool Ø mm	Feed column no.					
	81	**82**	**83**	**84**	**85**	**86**
	f (mm/rev.)					
2.00	0.03	0.04	0.06	0.08	0.10	0.13
2.50	0.03	0.05	0.07	0.10	0.13	0.16
3.15	0.03	0.05	0.08	0.11	0.15	0.20
4.00	0.04	0.06	0.09	0.13	0.17	0.22
5.00	0.04	0.07	0.10	0.14	0.18	0.23
6.30	0.04	0.07	0.12	0.15	0.19	0.24
8.00	0.05	0.08	0.13	0.16	0.20	0.25
10.00	0.06	0.09	0.14	0.17	0.22	0.26
12.50	0.06	0.10	0.15	0.19	0.23	0.28
16.00	0.07	0.11	0.17	0.21	0.26	0.31
20.00	0.08	0.13	0.18	0.23	0.28	0.33
25.00	0.09	0.15	0.21	0.26	0.30	0.38
31.50	0.12	0.17	0.24	0.30	0.36	0.42
40.00	0.14	0.21	0.28	0.34	0.40	0.46

Coolant:
○ Air
● Neat oil
● Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength MPa (N/mm²)	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345** P235GH(H1), **1.0425** P265GH(H2)	≤500		●
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	≤1000		●
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		●
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		●
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		●
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		●
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		●
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		●
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		●
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		●
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		●
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤65 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**0.6010** EN-GJL-100 (GG10), **0.6020** EN-GJL-200 (GG20)		≤240 HB	○ ○
	0.6025 EN-GJL-250 (GG25), **0.6035** EN-GJL-350 (GG35)		≤350 HB	○ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035** EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2 (GTS70)		≤350 HB	○
Chilled cast iron	–		≤350 HB	○
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	○ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	○ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		○ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		○ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
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	≤650		●
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●
≤ 24 % 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	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		●
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** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		○ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

5674	5676
Company standard	Company standard
HSCO	HSCO
A	A
82°	82°
cyl.	cyl.
424	426

5675	5677
Company standard	Company standard
HSCO	HSCO
A	A
82°	82°
3 surface	3 surface
425	427









v_c m/min	Feed col. no.	
41	83	83
39	82	82
41	83	83
39	82	82
41	83	83
39	83	83
25	82	82
19	83	83
15	82	82
32	83	83
19	83	83
13	82	82
19	82	82
15	81	81
22	82	82
19	81	81
19	81	81
13	81	81
20	82	82
15	81	81
18	81	81
32	83	83
20	83	83
28	83	83
25	83	83
10	81	81
28	83	83
18	83	83
10	81	81
19	82	82
13	81	81
114	84	84
89	84	84
51	83	83
39	83	83
127	84	84
76	84	84
101	84	84
64	84	84
39	84	84
33	84	84
31	84	84
25	84	84
39	84	84
51	84	84

v_c m/min	Feed col. no.	
41	83	83
39	82	82
41	83	83
39	82	82
41	83	83
39	83	83
25	82	82
19	83	83
15	82	82
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39	83	83
127	84	84
76	84	84
101	84	84
64	84	84
39	84	84
33	84	84
31	84	84
25	84	84
39	84	84
51	84	84


Component courtesy of Langer GmbH & Co. KG

CLAMPING SYSTEMS GM 300

5

Shrink fit chucks	*P. 451*
Hydraulic chucks	*P. 469*
Precision clamping chucks	*P. 476*
Precision collet holders	*P. 483*
Side lock holders	*P. 491*
Tapping chucks	*P. 495*

CLAMPING SYSTEMS
OVERVIEW

Shrink fit chucks

HSK-A HSK-C HSK-E SK MAS-BT CAT Cyl

- Shrink chucks are characterised by high concentricity, rigidity and high clamping force and are therefore ideally suited for HSC applications such as piloting (drilling), countersinking and milling.

New: long, slim design with optimised interference contour for improved accessibility, ideal for 5-axis machining

Hydraulic chucks

HSK-A HSK-C SK MAS-BT CAT

- Hydraulic expansion chucks are characterised by their easy handling, high damping and repeatable concentricity. They are ideal for drilling and reaming applications.

New: long, slim design with optimised interference contour for improved accessibility, ideal for 5-axis machining

Precision clamping chucks

HSK-A SK MAS-BT CAT Cyl

- HPC chucks offer extreme clamping force, rigidity and high concentricity. They are therefore ideally suited for heavy HPC milling and fast, precise HSC milling.

New: long, slim design for improved accessibility, ideal for 5-axis machining

Precision collet holders

HSK-A HSK-C HSK-E SK MAS-BT

- Precision collet chuck holders are characterised by their rotational symmetrical design, high flexibility and the best concentric accuracy. They are ideal for applications in the high speed range, such as for microprocessing.

New: Collet chuck holders with HSK-A and HSK-E interface

Side lock holders

HSK-A HSK-C SK MAS-BT

- Due to the simple handling and safe clamping of the tools, side lock holders are ideally suited for applications in the low speed and accuracy range, such as in roughing.

Tapping chucks

HSK-A SK MAS-BT Cyl

- The Gührosync tapping chucks are characterised by the perfect combination of hydraulic expansion chuck and synchro chuck. They reduce axial and radial forces during thread cutting and forming thanks to the optimal combination of durable metal springs and damping elements made of polymer. The advantages are higher tool life, excellent thread quality and high process reliability.



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Application-specific selection of tool holders

	Shrink fit chucks / shrink fit extensions	Hydraulic chucks / HMC 3000 / reduction bushes	GÜHROSYNC Hydraulic synchro tapping chucks
			
Main feature	For applications requiring slim interference contours and precision with good clamping force and rigidity at a moderate price.	Easy handling when stiffness and damping are required.	Combines the advantages of hydraulic expansion and synchro-clamping technology, compensates deviations of the machine optimally.
Main application	HSC – universal Drilling, countersinking, milling, reaming	Reaming and drilling Countersinking, HSC application, light milling	Synchronized thread cutting and thread forming
Characteristics	• highest concentricity accuracy thanks to patented damping screw • high stiffness and clamping force • modularly extendable	• high damping with high concentricity accuracy • simple handling • flexible use thanks to reducing bushes also with **GÜHRO**Jet	• perfect combination of hydraulic expansion chuck and synchro tapping chuck • simple handling • flexible use thanks to reducing bushes also with **GÜHRO**Jet • long-lasting axial and radial balancing
Interfaces	HSK-A, HSK-C, HSK-E, SK, MAS-BT, CAT, Cyl	HSK-A, HSK-C, SK, MAS-BT, CAT	HSK-A, SK, MAS-BT, Cyl
Clamping diameter range	3 - 32 mm	3 - 32 mm	Holder Ø 12: M2 - M12 (Mt max.: 26 Nm) Holder Ø 20: M4.5 - M20 (Mt max.: 90 Nm)
Concentricity	< 3 µm	< 3 µm	< 50 µm
Balance quality	G 2.5 with 25,000 1/min or U < 1 gmm	G 2.5 with 25,000 1/min or U < 1 gmm	G 6.3 with 15,000 1/min
Concentricity with 5xD	< 5 µm	< 5 µm	-
Clamping force	very high	very high	very high
Rigidity	very high	high	medium
Dampening	low	very high	very high
Interference contour	small / minimal	medium	medium
Handling	good	very good / very flexible	very good / very flexible
Actuation	Shrink fit device e. g. GSS 2000 article no. 4742	Hexagon key e. g. article no. 4912	Hexagon key e. g. article no. 4912

	HPC precision power chucks / clamping sleeves	Collet chucks ER	Straight shank holders “Weldon” / “Whistle-Notch”
			
Main feature	Provides extreme clamping force and rigidity to compensate lateral forces acting on the tool during HPC milling.	All-rounder for universal use in the low accuracy range.	Simple handling with safe clamping for applications involving large machining volumes.
Main application	HPC milling heavy HPC and fast, accurate HSC milling, drilling, universal application	Flexible – universal light machining, centering, chamfering, drilling, threading; intermediate shank dimensions	Roughing Milling, drilling
Characteristics	• extreme clamping force and stability thanks to mechanical clamping transmission • high precision and balancing quality • flexible use thanks to reducing bushes also with **GÜHRO**Jet	• flexible chuck for various shank dimensions and tolerances • for conventional machining operations	• robust, low cost chuck • for heavy machining in the lower speed and accuracy range
Interfaces	HSK-A, SK, MAS-BT, CAT, Cyl	HSK-A, HSK-C, HSK-E, SK, MAS-BT	HSK-A, HSK-C, SK, MAS-BT
Clamping diameter range	3 - 32 mm 1 - 6 mm (HPC extensions)	ER 11: 0.5 - 7.0 mm ER 16: 0.5 - 10.0 mm ER 20: 0.5 - 13.0 mm ER 25: 0.5 - 16.0 mm ER 32: 1.0 - 20.0 mm ER 40: 3.0 - 26.0 mm	6 - 40 mm
Concentricity	< 3 µm	< 10 µm	< 10 µm
Balance quality	G 2.5 with 20,000 1/min or U < 1.2 gmm	G 2.5 with 25,000 1/min or U < 1 gmm	G 6.3 with 15,000 1/min
Concentricity with 5xD	< 8 µm	< 20 µm	< 25 µm
Clamping force	extremely high	medium	very safe thanks to threaded pin
Rigidity	extremely high	medium	very high
Dampening	high	high	low
Interference contour	medium	large	large
Handling	very good / very flexible	good	good
Actuation	Hexagon key / torque wrench e. g. article no. 4987 + 4916 Type D	Hook spanner max. torque: information at GM 300 catalogue at clamping screw article no. 4903	Hexagon key max. torque: information at GM 300 catalogue at clamping screw article no. 4903

GÜHROSync

Shrink fit chucks

4736 HSK-A

4726 TSG 3000 HSK-A

4758 HSK-C

4738 SK

Hydraulic chucks with increased clamping force

4221 MAS-BT

4299 HSK-A

4267 HSK-C

4213 SK



4949 Coolant supply set HSK-A for conventional cooling



Hydraulic synchro tapping chucks

4601 HSK-A



4925 Pull studs for ISO taper

4926



Hydraulic synchro tapping chucks

4576 ISO taper



4927 Pull studs for MAS/BT

4928



Hydraulic synchro tapping chucks

4577 MAS-BT





4525

Hydro Ø 12 / Ø 20
Cylindrical hydraulic synchro tapping chucks Ø 20 with internal cooling



4364

Setting screws “face” synchro tapping chucks, with conventional int. cooling



4605 Reduction bush sealed

4606 **GÜHRO**Jet reduction bush



Threading tool:
shank diameter x square

MAS/BT DC with axial plane

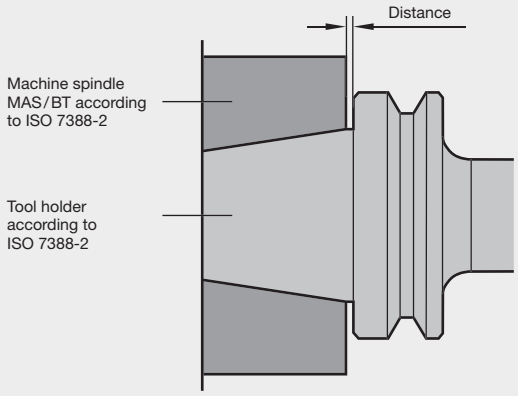
Gühring tool holders: MAS/BT DC = double contact

- suitable for machine spindles with MAS/BT spindle with axial plane as well as conventional machine spindles with MAS/BT interface according to ISO 7388-2 (JIS B 6339)
- additional axial plane compared to conventional MAS/BT tool holders according to ISO 7388-2

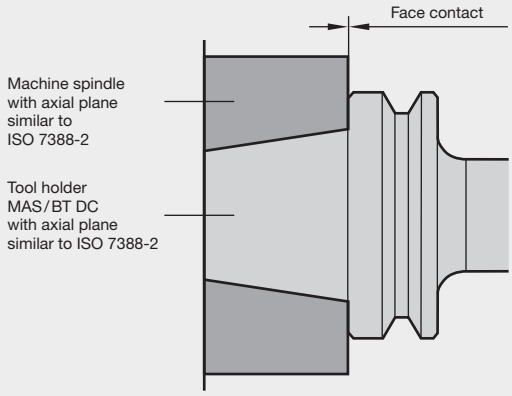
The combination of MAS/BT machine spindles and MAS/BT DC tool holders with axial plane ensures:

- optimised accuracy and repeatability
- better rigidity
- no axial displacing at high speeds

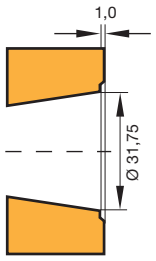
Conventional interface – ISO 7388-2



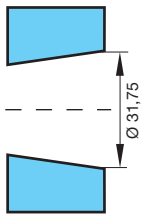
MAS/BT DC with axial plane – sim. to ISO 7388-2



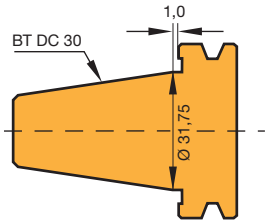
① **BT spindle with axial plane**



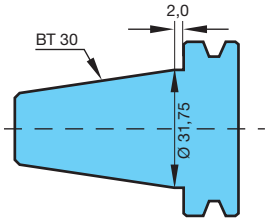
② **BT spindle “standard”**



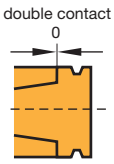
③ **BT DC tool holder with axial plane**



④ **BT tool holder acc. to nach ISO 7388-2**

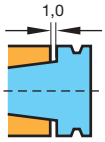


①+③ **BT spindle with axial plane + BT DC tool holder with axial plane**

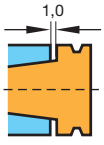


Only with this combination do the advantages of double contact come into effect.

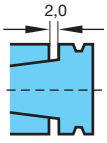
①+④ **BT spindle with axial plane + BT tool holder according to ISO 7388-2**



②+③ **BT spindle “standard” + BT DC tool holder with axial plane**



②+④ **BT spindle “standard” + BT tool holder according to ISO 7388-2**



These combinations are possible and compatible, but without the advantage of double contact.

Tool illustration	Interface	Standard	Article no.	Page
Shrink fit chucks HSK-A, slim design 3°				
	HSK-A	WN	4787	451
HSK-A shrink fit chucks				
	HSK-A	DIN 69882-8	4736	452
HSK-A shrink fit chucks GÜHROJET with peripherical cooling				
	HSK-A	WN	4755	455
Shrink fit chucks HSK-E, slim design 3°				
	HSK-E	WN	4789	457
HSK-E shrink fit chucks				
	HSK-E	WN	4737	458
ISO taper shrink fit chucks, slim design 3°				
	SK	WN	4788	460
ISO taper shrink fit chucks				
	SK	WN	4738	461
ISO taper shrink fit chucks GÜHROJET				
	SK	WN	4729	463
MAS/BT shrink fit chucks				
	MAS-BT	WN	4739	464
MAS/BT DC shrink fit chucks with axial plane				
	MAS-BT	WN	4790	466
Shrink fit extensions				
	~HA	WN	4719	467
HSK-A hydraulic chucks, slim design 3°				
	HSK-A	WN	4596	469

Tool illustration	Interface	Standard	Article no.	Page
HSK-A hydraulic chucks with increased clamping force				
	HSK-A	DIN 69882-7	4299	470
ISO taper hydraulic chucks, slim design 3°				
	SK	WN	4597	472
ISO taper hydraulic chucks with increased clamping force				
	SK	WN	4213	473
MAS/BT hydraulic chucks with increased clamping force				
	MAS-BT	WN	4221	474
MAS/BT DC hydraulic chucks with axial plane				
	MAS-BT	WN	4598	475
HSK-A precision clamping chucks				
	HSK-A	WN	4300	476
ISO taper precision clamping chucks				
	SK	WN	4301	477
MAS/BT precision clamping chucks				
	MAS-BT	WN	4244	478
Extensions HPC				
	HA	WN	4208	479
GÜHROJET clamping sleeves, for precision clamping chucks				
		WN	4302	480
Clamping sleeves for precision clamping chucks, sealed version				
	~HA	WN	4235	481
HSK-A precision collet holders				
	HSK-A	WN	4476	483

Tool illustration	Interface	Standard	Article no.	Page
HSK-E precision collet holders				
	HSK-E	WN	4475	484
Precision collets for precision collet holders				
		WN	4574	485
Precision collets for precision collet holders, sealed version				
		WN	4575	486
Retaining nut for precision collet holders				
		WN	4573	487
Roller bearing wrenches for precision collet holders				
		WN	4994	488
Roller bearing wrenches head for torque wrenches				
		WN	4995	489
Torque wrenches				
		WN	4981	490
GÜHROJET HSK-A Weldon side lock holders				
	HSK-A	DIN 69882-4	4232	491
GÜHROJET ISO taper Weldon side lock holders				
	SK	WN	4317	493
GÜHROJET MAS/BT Weldon side lock holders				
	MAS-BT	WN	4234	494
HSK-A hydraulic synchro tapping chucks with internal coolant				
	HSK-A	WN	4601	495
ISO taper hydraulic synchro tapping chucks with internal coolant				
	SK	WN	4576	496

Tool illustration	Interface	Standard	Article no.	Page
MAS/BT hydraulic synchro tapping chucks with internal coolant				
	MAS-BT	WN	4577	497
Straight shank hydraulic synchro tapping chucks for internal coolant				
		WN	4525	498
GÜHROJET reduction bushes for hydraulic synchro tapping chucks				
	Cyl	WN	4606	499
Adjustment screws “faces” for synchro tapping chucks with int. coolant				
		WN	4364	501

Tool holders

Slim design



+ slim interference contour for improved accessibility

+ maximum stability and concentricity for the best service life and surfaces

+ ideal accessibility, especially in 5-axis machining

Shrink fit chucks HSK-A, slim design 3°

HSK-A

NEW

Product information:

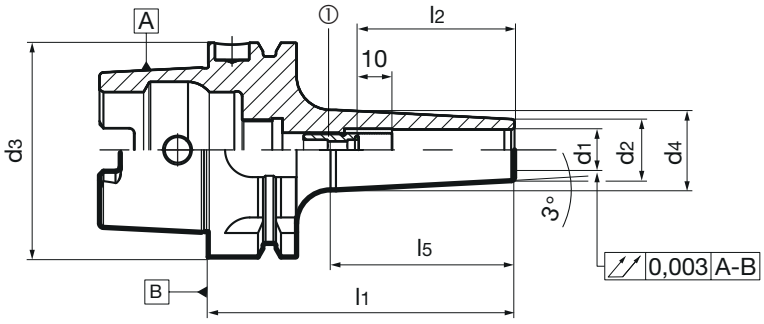
- HSK-A to ISO 12164-1 / DIN 69893-1
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for carbide tool shanks in tolerance h6 (from d1 14 mm also HSS possible)
- axial length adjustment
- concentricity:
  l1 up to 120 mm: max. 4 µm
  l1 up to 160 mm: max. 5 µm

Scope of delivery:

- incl. setting screw (1) with axial force art. no. 4941 or 4904

Suitable accessories separately available:

- coolant supply set art. no. 4949
- for MQL application on request
- special dimensions on request





Article no. **4787**

d3	d1 h6	d2	d4	l1	l2	l5	①		Order no.
	mm	mm	mm	mm	mm	mm		kg	
HSK-A 63	3	9	13.0	80	30	40	4904 5.016	0.6	4787 3.063
HSK-A 63	4	10	14.0	80	35	41	4904 6.016	0.7	4787 4.063
HSK-A 63	5	11	15.0	80	40	41	4904 8.018	0.7	4787 5.063
HSK-A 63	6	12	16.0	80	36	42	4941 6.100	0.7	4787 6.063
HSK-A 63	8	14	18.0	80	36	42	4941 8.100	0.7	4787 8.063
HSK-A 63	10	16	21.0	85	41	49	4941 10.100	0.7	4787 10.063
HSK-A 63	12	18	23.5	90	46	54	4941 12.100	0.7	4787 12.063
HSK-A 63	14	20	25.5	90	46	54	4941 14.100	0.7	4787 14.063
HSK-A 63	16	22	28.0	95	49	59	4941 16.100	0.8	4787 16.063
HSK-A 63	18	24	30.0	95	49	59	4941 18.100	0.8	4787 18.063
HSK-A 63	20	26	32.5	100	51	64	4941 20.100	0.9	4787 20.063
HSK-A 63	3	9	17.0	120	30	80	4904 5.016	0.7	4787 3.163
HSK-A 63	4	10	18.0	120	35	81	4904 6.016	0.7	4787 4.163
HSK-A 63	5	11	19.0	120	40	81	4904 8.018	0.7	4787 5.163
HSK-A 63	6	12	20.5	120	36	82	4941 6.041	0.8	4787 6.163
HSK-A 63	8	14	22.5	120	36	82	4941 8.040	0.8	4787 8.163
HSK-A 63	10	16	24.5	120	41	82	4941 10.050	0.8	4787 10.163
HSK-A 63	12	18	26.5	120	46	83	4941 12.100	0.9	4787 12.163
HSK-A 63	14	20	28.5	120	46	83	4941 14.100	0.9	4787 14.163
HSK-A 63	16	22	30.5	120	49	83	4941 16.100	0.9	4787 16.163
HSK-A 63	18	24	32.7	120	49	84	4941 18.100	1.0	4787 18.163
HSK-A 63	20	26	34.7	120	51	85	4941 20.100	1.0	4787 20.163
HSK-A 63	3	9	21.5	160	30	121	4904 5.016	0.8	4787 3.263
HSK-A 63	4	10	22.5	160	35	121	4904 6.016	0.8	4787 4.263
HSK-A 63	5	11	23.5	160	40	121	4904 8.018	0.9	4787 5.263
HSK-A 63	6	12	24.5	160	36	122	4941 6.041	0.9	4787 6.263
HSK-A 63	8	14	26.5	160	36	122	4941 8.040	1.0	4787 8.263
HSK-A 63	10	16	28.5	160	41	122	4941 10.050	1.0	4787 10.263
HSK-A 63	12	18	30.5	160	46	123	4941 12.100	1.1	4787 12.263
HSK-A 63	14	20	32.8	160	46	124	4941 14.100	1.1	4787 14.263
HSK-A 63	16	22	34.8	160	49	125	4941 16.100	1.2	4787 16.263
HSK-A 63	18	24	37.0	160	49	126	4941 18.100	1.3	4787 18.263
HSK-A 63	20	26	39.0	160	51	127	4941 20.100	1.3	4787 20.263

HSK-A shrink fit chucks

HSK-A

Product information:

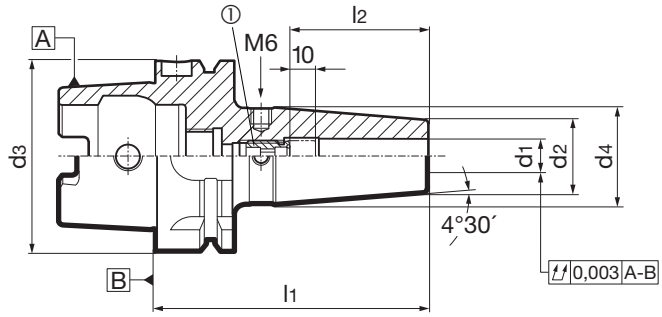
- HSK-A to ISO 12164-1 / DIN 69893-1
- dimensions to DIN 69882-8
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- incl. balancing thread 4xM6/6xM6
- for tool shank tolerance h6
- axial length adjustment
- concentricity: 3 µm
  l1 from 120 mm = 4 µm
  l1 from 160 mm = 5 µm
  l1 from 200 mm = 7 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4977 or 4904

Suitable accessories separately available:

- coolant supply set art. no. 4949
- special dimensions on request





Article no. **4736**

d3	d1 h6	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
HSK-A 32	6	21	26.0	70	36	4977 6.014	0.2	4736 6.032
HSK-A 32	8	21	26.0	70	36	4977 8.014	0.2	4736 8.032
HSK-A 32	10	24	30.0	75	41	4977 10.014	0.3	4736 10.032
HSK-A 32	12	24	30.0	80	46	4977 12.014	0.3	4736 12.032
HSK-A 40	6	21	27.0	80	36	4977 6.014	0.4	4736 6.040
HSK-A 40	8	21	27.0	80	36	4977 8.014	0.4	4736 8.040
HSK-A 40	10	24	32.0	80	41	4977 10.014	0.4	4736 10.040
HSK-A 40	12	24	32.0	90	46	4977 12.014	0.5	4736 12.040
HSK-A 40	14	27	34.0	90	46	4977 12.014	0.5	4736 14.040
HSK-A 40	16	27	34.0	90	49	4977 16.014	0.5	4736 16.040
HSK-A 40	18	33	42.0	95	49	4977 16.014	0.7	4736 18.040
HSK-A 40	20	33	42.0	100	51	4977 20.114	0.7	4736 20.040
HSK-A 50	6	21	27.0	80	36	4977 6.014	0.5	4736 6.050
HSK-A 50	8	21	27.0	80	36	4977 8.014	0.5	4736 8.050
HSK-A 50	10	24	32.0	85	41	4977 10.014	0.6	4736 10.050
HSK-A 50	12	24	32.0	90	46	4977 12.014	0.6	4736 12.050
HSK-A 50	14	27	34.0	90	46	4977 12.014	0.7	4736 14.050
HSK-A 50	16	27	34.0	95	49	4977 16.014	0.7	4736 16.050
HSK-A 50	18	33	42.0	95	49	4977 16.014	0.8	4736 18.050
HSK-A 50	20	33	42.0	100	51	4977 20.114	0.9	4736 20.050
HSK-A 63	3	10	18.0	80	30	4904 5.016	0.7	4736 3.063
HSK-A 63	4	10	18.0	80	35	4904 6.016	0.7	4736 4.063
HSK-A 63	5	10	18.0	80	40	4904 8.018	0.7	4736 5.063
HSK-A 63	6	21	27.0	80	36	4977 6.014	0.8	4736 6.063
HSK-A 63	8	21	27.0	80	36	4977 8.014	0.8	4736 8.063
HSK-A 63	10	24	32.0	85	41	4977 10.014	0.9	4736 10.063
HSK-A 63	12	24	32.0	90	46	4977 12.014	0.9	4736 12.063
HSK-A 63	14	27	34.0	90	46	4977 12.014	0.9	4736 14.063
HSK-A 63	16	27	34.0	95	49	4977 16.014	0.9	4736 16.063
HSK-A 63	18	33	42.0	95	49	4977 16.014	1.1	4736 18.063
HSK-A 63	20	33	42.0	100	51	4977 20.114	1.1	4736 20.063
HSK-A 63	25	44	53.0	115	57	4977 20.114	1.7	4736 25.063
HSK-A 63	32	44	53.0	120	61	4977 20.114	1.6	4736 32.063
HSK-A 63	3	10	31.1	160	30	4904 5.016	0.9	4736 103.063
HSK-A 63	4	10	31.1	160	35	4904 6.016	0.9	4736 104.063
HSK-A 63	5	10	31.1	160	40	4904 8.018	0.9	4736 105.063

Article no. **4736**

d3	d1 h6	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
HSK-A 63	6	21	27.0	160	36	4977 6.014	1.1	4736 106.063
HSK-A 63	8	21	27.0	160	36	4977 8.014	1.1	4736 108.063
HSK-A 63	10	24	32.0	160	41	4977 10.014	1.3	4736 110.063
HSK-A 63	12	24	32.0	160	46	4977 12.014	1.3	4736 112.063
HSK-A 63	14	27	34.0	160	46	4977 12.014	1.4	4736 114.063
HSK-A 63	16	27	34.0	160	49	4977 16.014	1.4	4736 116.063
HSK-A 63	18	33	42.0	160	49	4977 16.014	1.8	4736 118.063
HSK-A 63	20	33	42.0	160	51	4977 20.114	1.7	4736 120.063
HSK-A 63	25	44	53.0	160	57	4977 20.114	2.4	4736 125.063
HSK-A 63	32	44	53.0	160	61	4977 20.114	2.3	4736 132.063
HSK-A 63	3	10	25.0	120	30	4904 5.016	0.8	4736 203.063
HSK-A 63	4	10	25.0	120	35	4904 6.016	0.8	4736 204.063
HSK-A 63	5	10	25.0	120	40	4904 8.018	0.8	4736 205.063
HSK-A 63	6	21	27.0	120	36	4977 6.014	0.9	4736 206.063
HSK-A 63	8	21	27.0	120	36	4977 8.014	0.9	4736 208.063
HSK-A 63	10	24	32.0	120	41	4977 10.014	1.1	4736 210.063
HSK-A 63	12	24	32.0	120	46	4977 12.014	1.0	4736 212.063
HSK-A 63	14	27	34.0	120	46	4977 12.014	1.1	4736 214.063
HSK-A 63	16	27	34.0	120	49	4977 16.014	1.1	4736 216.063
HSK-A 63	18	33	42.0	120	49	4977 16.014	1.4	4736 218.063
HSK-A 63	20	33	42.0	120	51	4977 20.114	1.3	4736 220.063
HSK-A 63	6	21	27.0	200	36	4977 6.014	1.3	4736 306.063
HSK-A 63	8	21	27.0	200	36	4977 8.014	1.3	4736 308.063
HSK-A 63	10	24	32.0	200	41	4977 10.014	1.5	4736 310.063
HSK-A 63	12	24	32.0	200	46	4977 12.014	1.5	4736 312.063
HSK-A 63	14	27	34.0	200	46	4977 12.014	1.7	4736 314.063
HSK-A 63	16	27	34.0	200	49	4977 16.014	1.6	4736 316.063
HSK-A 63	18	33	42.0	200	49	4977 16.014	2.2	4736 318.063
HSK-A 63	20	33	42.0	200	51	4977 20.114	2.2	4736 320.063
HSK-A 63	25	44	53.0	200	57	4977 20.114	3.1	4736 325.063
HSK-A 63	32	44	53.0	200	61	4977 20.114	2.9	4736 332.063
HSK-A 80	6	21	27.0	85	36	4977 6.014	1.2	4736 6.080
HSK-A 80	8	21	27.0	85	36	4977 8.014	1.2	4736 8.080
HSK-A 80	10	24	32.0	90	41	4977 10.014	1.3	4736 10.080
HSK-A 80	12	24	32.0	95	46	4977 12.014	1.3	4736 12.080
HSK-A 80	14	27	34.0	95	46	4977 12.014	1.4	4736 14.080
HSK-A 80	16	27	34.0	100	49	4977 16.014	1.4	4736 16.080
HSK-A 80	18	33	42.0	100	49	4977 16.014	1.6	4736 18.080
HSK-A 80	20	33	42.0	105	51	4977 20.114	1.6	4736 20.080
HSK-A 80	25	44	53.0	115	57	4977 20.114	2.2	4736 25.080
HSK-A 80	32	44	53.0	120	61	4977 20.114	2.1	4736 32.080
HSK-A 80	6	21	27.0	160	36	4977 6.014	1.5	4736 106.080
HSK-A 80	8	21	27.0	160	36	4977 8.014	1.5	4736 108.080
HSK-A 80	10	24	32.0	160	41	4977 10.014	1.7	4736 110.080
HSK-A 80	12	24	32.0	160	46	4977 12.014	1.7	4736 112.080
HSK-A 80	14	27	34.0	160	46	4977 12.014	1.8	4736 114.080
HSK-A 80	16	27	34.0	160	49	4977 16.014	1.8	4736 116.080
HSK-A 80	18	33	42.0	160	49	4977 16.014	2.2	4736 118.080
HSK-A 80	20	33	42.0	160	51	4977 20.114	2.2	4736 120.080
HSK-A 80	25	44	53.0	160	57	4977 20.114	2.9	4736 125.080
HSK-A 80	32	44	53.0	160	61	4977 20.114	2.7	4736 132.080
HSK-A 100	6	21	27.0	85	36	4977 6.014	2.1	4736 6.100
HSK-A 100	8	21	27.0	85	36	4977 8.014	2.1	4736 8.100
HSK-A 100	10	24	32.0	90	41	4977 10.014	2.2	4736 10.100
HSK-A 100	12	24	32.0	95	46	4977 12.014	2.2	4736 12.100
HSK-A 100	14	27	34.0	95	46	4977 12.014	2.3	4736 14.100
HSK-A 100	16	27	34.0	100	49	4977 16.014	2.3	4736 16.100
HSK-A 100	18	33	42.0	100	49	4977 16.014	2.5	4736 18.100
HSK-A 100	20	33	42.0	105	51	4977 20.114	2.5	4736 20.100
HSK-A 100	25	44	53.0	115	57	4977 20.114	3.0	4736 25.100
HSK-A 100	32	44	53.0	120	61	4977 20.114	2.9	4736 32.100
HSK-A 100	6	21	27.0	160	36	4977 6.014	2.4	4736 106.100
HSK-A 100	8	21	27.0	160	36	4977 8.014	2.4	4736 108.100
HSK-A 100	10	24	32.0	160	41	4977 10.014	2.6	4736 110.100
HSK-A 100	12	24	32.0	160	46	4977 12.014	2.6	4736 112.100
HSK-A 100	14	27	34.0	160	46	4977 12.014	2.7	4736 114.100

							Article no.	**4736**
d3	d1 h6	d2	d4	l1	l2	①		**Order no.**
	mm	mm	mm	mm	mm		kg	
HSK-A 100	16	27	34.0	160	49	4977 16.014	2.7	4736 116.100
HSK-A 100	18	33	42.0	160	49	4977 16.014	3.1	4736 118.100
HSK-A 100	20	33	42.0	160	51	4977 20.114	3.1	4736 120.100
HSK-A 100	25	44	53.0	160	57	4977 20.114	3.8	4736 125.100
HSK-A 100	32	44	53.0	160	61	4977 20.114	3.6	4736 132.100
HSK-A 100	6	21	27.0	200	36	4977 6.014	2.6	4736 306.100
HSK-A 100	8	21	27.0	200	36	4977 8.014	2.6	4736 308.100
HSK-A 100	10	24	32.0	200	41	4977 10.014	2.9	4736 310.100
HSK-A 100	12	24	32.0	200	46	4977 12.014	2.9	4736 312.100
HSK-A 100	14	27	34.0	200	46	4977 12.014	3.0	4736 314.100
HSK-A 100	16	27	34.0	200	49	4977 16.014	3.0	4736 316.100
HSK-A 100	18	33	42.0	200	49	4977 16.014	3.5	4736 318.100
HSK-A 100	20	33	42.0	200	51	4977 20.114	3.5	4736 320.100
HSK-A 100	25	44	53.0	200	57	4977 20.114	4.5	4736 325.100
HSK-A 100	32	44	53.0	200	61	4977 20.114	4.3	4736 332.100

HSK-A shrink fit chucks GÜHROJET with peripherical cooling

HSK-A

Product information:

- HSK-A to ISO 12164-1 / DIN 69893-1
- dimensions to DIN 69882-8
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- incl. balancing thread 4xM6/6xM6
- for tool shank tolerance h6
- axial length adjustment
- optimised cooling for tools without internal coolant
- good chip evacuation and increased process reliability
- coolant ducts: d1 = 6 - 10 mm with two coolant ducts d1 = 12 - 32 mm with four coolant ducts
- concentricity: 3 µm
  l1 from 120 mm: = 4 µm

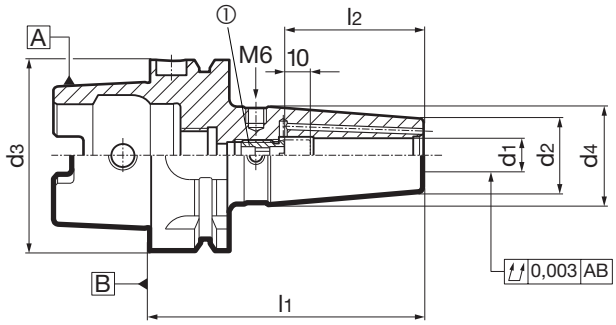
Scope of delivery:

- incl. setting screw (1) art. no. 4938

Suitable accessories separately available:

- coolant supply set art. no. 4949
- special dimensions on request

GÜHROJET





Article no. **4755**

d3	d1 h6	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
HSK-A 40	6	21	27.0	80	36	4938 6.000	0.5	4755 6.040
HSK-A 40	8	21	27.0	80	36	4938 8.000	0.5	4755 8.040
HSK-A 40	10	24	32.0	80	41	4938 10.000	0.5	4755 10.040
HSK-A 40	12	24	32.0	90	46	4938 12.000	0.5	4755 12.040
HSK-A 40	14	27	33.5	90	46	4938 12.000	0.5	4755 14.040
HSK-A 40	16	27	33.5	90	49	4938 16.000	0.5	4755 16.040
HSK-A 50	6	21	27.0	80	36	4938 6.000	0.6	4755 6.050
HSK-A 50	8	21	27.0	80	36	4938 8.000	0.6	4755 8.050
HSK-A 50	10	24	32.0	85	41	4938 10.000	0.6	4755 10.050
HSK-A 50	12	24	32.0	90	46	4938 12.000	0.7	4755 12.050
HSK-A 50	14	27	34.0	90	46	4938 12.000	0.7	4755 14.050
HSK-A 50	16	27	34.0	95	49	4938 16.000	0.7	4755 16.050
HSK-A 50	18	33	41.5	95	49	4938 16.000	0.9	4755 18.050
HSK-A 50	20	33	41.5	100	51	4938 20.000	0.9	4755 20.050
HSK-A 63	6	21	27.0	80	36	4938 6.000	0.8	4755 6.063
HSK-A 63	8	21	27.0	80	36	4938 8.000	0.8	4755 8.063
HSK-A 63	10	24	32.0	85	41	4938 10.000	0.9	4755 10.063
HSK-A 63	12	24	32.0	90	46	4938 12.000	0.9	4755 12.063
HSK-A 63	14	27	34.0	90	46	4938 12.000	1.0	4755 14.063
HSK-A 63	16	27	34.0	95	49	4938 16.000	1.0	4755 16.063
HSK-A 63	18	33	42.0	95	49	4938 16.000	1.2	4755 18.063
HSK-A 63	20	33	42.0	100	51	4938 20.000	1.2	4755 20.063
HSK-A 63	6	21	27.0	120	36	4938 6.000	0.9	4755 206.063
HSK-A 63	8	21	27.0	120	36	4938 8.000	1.0	4755 208.063
HSK-A 63	10	24	32.0	120	41	4938 10.000	1.1	4755 210.063
HSK-A 63	12	24	32.0	120	46	4938 12.000	1.2	4755 212.063
HSK-A 63	14	27	34.0	120	46	4938 12.000	1.2	4755 214.063
HSK-A 63	16	27	34.0	120	49	4938 16.000	1.1	4755 216.063
HSK-A 63	18	33	42.0	120	49	4938 16.000	1.2	4755 218.063
HSK-A 63	20	33	42.0	120	51	4938 20.000	1.4	4755 220.063
HSK-A 100	6	21	27.0	85	36	4938 6.000	2.2	4755 6.100
HSK-A 100	8	21	27.0	85	36	4938 8.000	2.2	4755 8.100
HSK-A 100	10	24	32.0	90	41	4938 10.000	2.3	4755 10.100
HSK-A 100	12	24	32.0	95	46	4938 12.000	2.3	4755 12.100
HSK-A 100	14	27	34.0	95	46	4938 12.000	2.3	4755 14.100
HSK-A 100	16	27	34.0	100	49	4938 16.000	2.3	4755 16.100

							Article no.	**4755**
d3	d1 h6	d2	d4	l1	l2	①		**Order no.**
	mm	mm	mm	mm	mm		kg	
HSK-A 100	18	33	42.0	100	49	4938 16.000	2.5	4755 18.100
HSK-A 100	20	33	42.0	105	51	4938 20.000	2.5	4755 20.100
HSK-A 100	25	44	53.0	115	57	4938 20.000	3.0	4755 25.100
HSK-A 100	32	44	53.0	120	61	4938 20.000	3.0	4755 32.100

Shrink fit chucks HSK-E, slim design 3°

HSK-E

NEW

Product information:

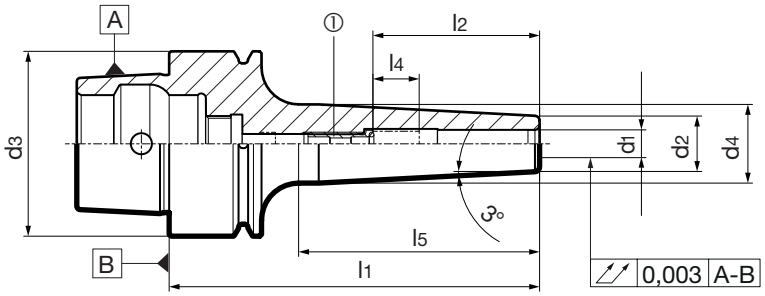
- HSK-E according to DIN 69893-5 with access hole in taper for manual tool change
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for carbide tool shanks in tolerance h6 (from d1 14 mm also HSS possible)
- axial length adjustment
- concentricity 3 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4904 or 4977

Suitable accessories separately available:

- coolant supply set art. no. 4949
- special dimensions on request





Article no. **4789**

d3	d1 h6	d2	d4	l1	l5	l4	l2	①		Order no.
	mm	mm	mm	mm	mm	mm	mm		kg	
HSK-E 40	3	9	12.0	60	30.0	10	30	4904 5.007	0.2	4789 3.040
HSK-E 40	4	10	13.0	60	31.0	10	35	4904 5.007	0.2	4789 4.040
HSK-E 40	5	11	14.0	60	31.0	10	36	4904 6.007	0.2	4789 5.040
HSK-E 40	6	12	15.0	60	32.0	5	36	4977 5.009	0.2	4789 6.040
HSK-E 40	8	14	17.0	60	32.0	5	36	4977 5.009	0.2	4789 8.040
HSK-E 40	10	16	19.5	60	34.0	5	38	4904 5.007	0.2	4789 10.040
HSK-E 40	12	18	21.5	60	34.5	3	40	4904 5.005	0.2	4789 12.040
HSK-E 40	3	9	14.0	80	50.0	10	30	4904 5.016	0.2	4789 3.140
HSK-E 40	4	10	15.0	80	51.0	10	35	4904 5.016	0.2	4789 4.140
HSK-E 40	5	11	16.0	80	51.0	10	40	4904 6.016	0.2	4789 5.140
HSK-E 40	6	12	17.0	80	52.0	10	36	4977 6.014	0.2	4789 6.140
HSK-E 40	8	14	19.0	80	52.5	10	36	4977 8.014	0.8	4789 8.140
HSK-E 40	10	16	21.5	80	54.0	10	41	4977 10.014	0.3	4789 10.140
HSK-E 40	12	18	23.5	80	55.0	10	46	4977 8.014	0.3	4789 12.140
HSK-E 50	3	9	13.0	80	40.0	10	30	4904 5.016	0.4	4789 3.050
HSK-E 50	4	10	14.0	80	41.0	10	35	4904 6.016	0.4	4789 4.050
HSK-E 50	5	11	15.0	80	41.0	10	40	4904 6.016	0.4	4789 5.050
HSK-E 50	6	12	16.0	80	42.0	10	36	4977 6.014	0.4	4789 6.050
HSK-E 50	8	14	18.0	80	42.0	10	36	4977 8.014	0.5	4789 8.050
HSK-E 50	10	16	20.5	80	44.0	10	41	4977 10.014	0.5	4789 10.050
HSK-E 50	12	18	22.5	80	44.5	10	46	4977 8.014	0.5	4789 12.050
HSK-E 50	14	20	24.5	80	45.5	10	46	4977 8.014	0.5	4789 14.050
HSK-E 50	16	22	26.5	80	46.5	10	49	4977 8.014	0.5	4789 16.050

HSK-E shrink fit chucks

HSK-E

Product information:

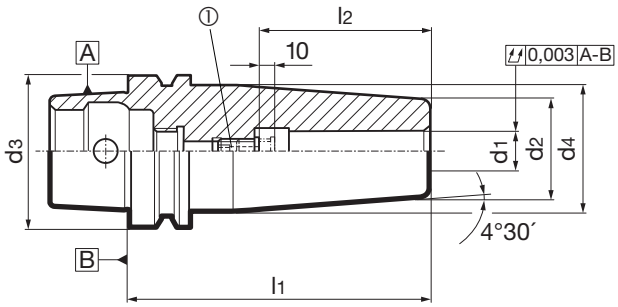
- HSK-E according to DIN 69893-5 with access hole in taper for manual tool change
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for tool shank tolerance h6
- axial length adjustment
- concentricity 3 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4977 or 4904

Suitable accessories separately available:

- coolant supply set art. no. 4949
- special dimensions on request





Article no. **4737**

d3	d1 h6	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
HSK-E 32	3	10	15.9	60			0.1	4737 3.032
HSK-E 32	4	10	15.9	60			0.1	4737 4.032
HSK-E 32	5	10	15.9	60			0.1	4737 5.032
HSK-E 32	6	21	26.0	70	36	4977 6.014	0.1	4737 6.032
HSK-E 32	8	21	26.0	70	36	4977 8.014	0.2	4737 8.032
HSK-E 32	10	24	29.0	75	41	4977 10.014	0.2	4737 10.032
HSK-E 32	12	24	29.0	80	46	4977 12.014	0.2	4737 12.032
HSK-E 40	3	10	19.0	80			0.2	4737 3.040
HSK-E 40	4	10	19.0	80			0.2	4737 4.040
HSK-E 40	5	10	19.0	80			0.2	4737 5.040
HSK-E 40	6	21	27.0	80	36	4977 6.014	0.4	4737 6.040
HSK-E 40	8	21	27.0	80	36	4977 8.014	0.4	4737 8.040
HSK-E 40	10	24	32.0	80	41	4977 10.014	0.4	4737 10.040
HSK-E 40	12	24	32.0	90	46	4977 12.014	0.5	4737 12.040
HSK-E 40	14	27	34.0	90	46	4977 12.014	0.5	4737 14.040
HSK-E 40	16	27	34.0	90	49	4977 16.014	0.5	4737 16.040
HSK-E 50	3	10	18.0	80	30	4904 5.016	0.4	4737 3.050
HSK-E 50	4	10	18.0	80	35	4904 6.016	0.4	4737 4.050
HSK-E 50	5	10	18.0	80			0.4	4737 5.050
HSK-E 50	6	21	27.0	80	36	4977 6.014	0.5	4737 6.050
HSK-E 50	8	21	27.0	80	36	4977 8.014	0.5	4737 8.050
HSK-E 50	10	24	32.0	85	41	4977 10.014	0.5	4737 10.050
HSK-E 50	12	24	32.0	90	46	4977 12.014	0.6	4737 12.050
HSK-E 50	14	27	34.0	90	46	4977 12.014	0.7	4737 14.050
HSK-E 50	16	27	34.0	95	49	4977 16.014	0.7	4737 16.050
HSK-E 50	18	33	42.0	95	49	4977 16.014	0.9	4737 18.050
HSK-E 50	20	33	42.0	100	51	4977 20.114	0.9	4737 20.050
HSK-E 63	6	21	27.0	80	36	4977 6.014	0.8	4737 6.063
HSK-E 63	8	21	27.0	80	36	4977 8.014	0.8	4737 8.063
HSK-E 63	10	24	32.0	85	41	4977 10.014	0.9	4737 10.063
HSK-E 63	12	24	32.0	90	46	4977 12.014	0.9	4737 12.063
HSK-E 63	14	27	34.0	90	46	4977 12.014	1.0	4737 14.063
HSK-E 63	16	27	34.0	95	49	4977 16.014	1.0	4737 16.063
HSK-E 63	18	33	42.0	95	49	4977 16.014	1.1	4737 18.063
HSK-E 63	20	33	42.0	100	51	4977 20.114	1.2	4737 20.063
HSK-E 63	25	44	53.0	115	57	4977 20.114	1.8	4737 25.063

	Article no.	**4737**

d3	d1 h6	d2	d4	l1	l2	①		**Order no.**
	mm	mm	mm	mm	mm		kg	
HSK-E 63	32	44	53.0	120	61	4977 20.114	1.7	4737 32.063

ISO taper shrink fit chucks, slim design 3°

SK

NEW

Product information:

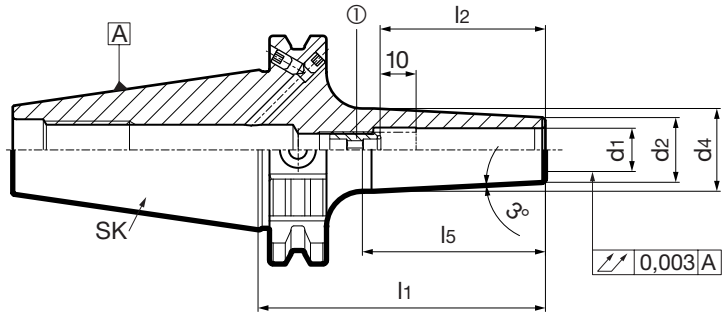
- SK to DIN ISO 7388-1 form AD/AF
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for carbide tool shanks in tolerance h6 (from d1 14 mm also HSS possible)
- axial length adjustment
- concentricity: 3 µm
  l1 up to 120 mm: max. 4 µm
  l1 up to 160 mm: max. 5 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4904 or 4977

Suitable accessories separately available:

- ISO pull studs art. no. 4925, 4926





Article no. **4788**

SK	d1 h6	d2	d4	l1	l2	l5	①		Order no.
	mm	mm	mm	mm	mm	mm		kg	
SK 40	3	9	13.5	80	30	46	4904 5.016	0.8	4788 3.040
SK 40	4	10	14.5	80	35	46	4904 6.016	0.8	4788 4.040
SK 40	5	11	15.5	80	40	47	4904 8.018	0.8	4788 5.040
SK 40	6	12	16.5	80	36	48	4977 6.014	0.8	4788 6.040
SK 40	8	14	19.0	80	36	49	4977 8.014	0.8	4788 8.040
SK 40	10	16	21.0	80	41	50	4977 10.014	0.9	4788 10.040
SK 40	12	18	23.0	80	46	51	4977 12.014	0.9	4788 12.040
SK 40	14	20	25.0	80	46	52	4977 12.014	0.9	4788 14.040
SK 40	16	22	27.0	80	49	53	4977 16.014	0.9	4788 16.040
SK 40	18	24	29.5	80	49	54	4977 16.014	0.9	4788 18.040
SK 40	20	26	31.5	80	51	55	4977 20.114	0.9	4788 20.040
SK 40	3	9	18.0	120	30	88	4904 5.016	0.9	4788 3.140
SK 40	4	10	19.0	120	35	88	4904 6.016	0.9	4788 4.140
SK 40	5	11	20.0	120	40	89	4904 8.018	0.9	4788 5.140
SK 40	6	12	21.0	120	36	90	4977 6.014	0.9	4788 6.140
SK 40	8	14	23.5	120	36	92	4977 8.014	1.0	4788 8.140
SK 40	10	16	25.5	120	41	92	4977 10.014	1.0	4788 10.140
SK 40	12	18	27.5	120	46	93	4977 12.014	1.0	4788 12.140
SK 40	14	20	29.5	120	46	94	4977 12.014	1.1	4788 14.140
SK 40	16	22	31.5	120	49	95	4977 16.014	1.1	4788 16.140
SK 40	18	24	33.5	120	49	96	4977 16.014	1.1	4788 18.140
SK 40	20	26	36.0	120	51	97	4977 20.114	1.2	4788 20.140
SK 40	3	9	22.5	160	30	130	4904 5.016	1.0	4788 3.240
SK 40	4	10	23.5	160	35	130	4904 6.016	1.0	4788 4.240
SK 40	5	11	24.5	160	40	131	4904 8.018	1.0	4788 5.240
SK 40	6	12	25.5	160	36	132	4977 6.014	1.1	4788 6.240
SK 40	8	14	27.5	160	36	132	4977 8.014	1.1	4788 8.240
SK 40	10	16	30.0	160	41	134	4977 10.014	1.2	4788 10.240
SK 40	12	18	32.0	160	46	135	4977 12.014	1.2	4788 12.240
SK 40	14	20	34.0	160	46	136	4977 12.014	1.3	4788 14.240
SK 40	16	22	36.0	160	49	137	4977 16.014	1.4	4788 16.240
SK 40	18	24	38.0	160	49	137	4977 16.014	1.4	4788 18.240
SK 40	20	26	40.5	160	51	139	4977 20.114	1.5	4788 20.240

ISO taper shrink fit chucks

SK

Product information:

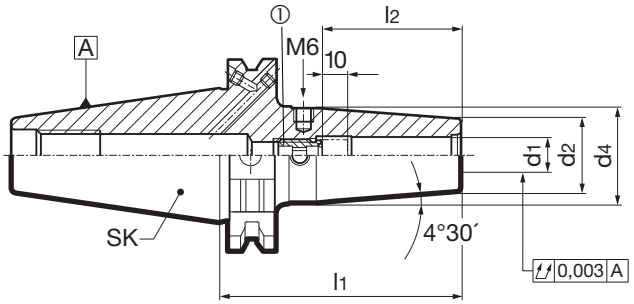
- SK to DIN ISO 7388-1 form AD/AF
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- incl. balancing thread 4xM6/6xM6
- for tool shank tolerance h6
- axial length adjustment
- concentricity: 3 µm
  l1 from 120 mm = 4 µm
  l1 from 160 mm = 5 µm
  l1 from 200 mm = 7 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4977 or 4904

Suitable accessories separately available:

- ISO pull studs art. no. 4925, 4926





Article no. **4738**

SK	d1 h6	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
SK 40	3	10	18.0	80	30	4904 5.016	0.9	4738 3.040
SK 40	4	10	18.0	80	35	4904 6.016	0.9	4738 4.040
SK 40	5	10	18.0	80	40	4904 8.018	0.9	4738 5.040
SK 40	6	21	27.0	80	36	4977 6.014	1.0	4738 6.040
SK 40	8	21	27.0	80	36	4977 8.014	1.0	4738 8.040
SK 40	10	24	32.0	80	41	4977 10.014	1.1	4738 10.040
SK 40	12	24	32.0	80	46	4977 12.014	1.0	4738 12.040
SK 40	14	27	34.0	80	46	4977 12.014	1.1	4738 14.040
SK 40	16	27	34.0	80	49	4977 16.014	1.1	4738 16.040
SK 40	18	33	42.0	80	49	4977 16.014	1.2	4738 18.040
SK 40	20	33	42.0	80	51	4977 20.114	1.5	4738 20.040
SK 40	25	44	53.0	100	57	4977 20.114	1.5	4738 25.040
SK 40	32	44	53.0	100	61	4977 20.114	1.5	4738 32.040
SK 40	3	10	31.0	160	30	4904 5.016	1.1	4738 103.040
SK 40	4	10	31.0	160	35	4904 6.016	1.1	4738 104.040
SK 40	5	10	31.0	160	40	4904 8.018	1.1	4738 105.040
SK 40	6	21	27.0	160	36	4977 6.014	1.3	4738 106.040
SK 40	8	21	27.0	160	36	4977 8.014	1.3	4738 108.040
SK 40	10	24	32.0	160	41	4977 10.014	1.5	4738 110.040
SK 40	12	24	32.0	160	46	4977 12.014	1.5	4738 112.040
SK 40	14	27	34.0	160	46	4977 12.014	1.7	4738 114.040
SK 40	16	27	34.0	160	49	4977 16.014	1.7	4738 116.040
SK 40	18	33	42.0	160	49	4977 16.014	1.9	4738 118.040
SK 40	20	33	42.0	160	51	4977 20.114	1.9	4738 120.040
SK 40	25	44	53.0	160	57	4977 20.114	2.2	4738 125.040
SK 40	3	10	24.0	120	30	4904 5.016	1.0	4738 203.040
SK 40	4	10	24.0	120	35	4904 6.016	1.0	4738 204.040
SK 40	5	10	24.0	120	40	4904 8.018	1.0	4738 205.040
SK 40	6	21	27.0	120	36	4977 6.014	1.1	4738 206.040
SK 40	8	21	27.0	120	36	4977 8.014	1.1	4738 208.040
SK 40	10	24	32.0	120	41	4977 10.014	1.2	4738 210.040
SK 40	12	24	32.0	120	46	4977 12.014	1.2	4738 212.040
SK 40	14	27	34.0	120	46	4977 12.014	1.4	4738 214.040
SK 40	16	27	34.0	120	49	4977 16.014	1.4	4738 216.040
SK 40	18	33	42.0	120	49	4977 16.014	1.5	4738 218.040
SK 40	20	33	42.0	120	51	4977 20.114	1.5	4738 220.040

	Article no.	4738

SK	d1 h6	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
SK 40	6	21	27.0	200	36	4977 6.014	1.6	4738 306.040
SK 40	8	21	27.0	200	36	4977 8.014	1.6	4738 308.040
SK 40	10	24	32.0	200	41	4977 10.014	1.8	4738 310.040
SK 40	12	24	32.0	200	46	4977 12.014	1.8	4738 312.040
SK 40	14	27	34.0	200	46	4977 12.014	2.1	4738 314.040
SK 40	16	27	34.0	200	49	4977 16.014	2.1	4738 316.040
SK 40	18	33	42.0	200	49	4977 16.014	2.3	4738 318.040
SK 40	20	33	42.0	200	51	4977 20.114	2.3	4738 320.040
SK 40	25	44	53.0	200	57	4977 20.114	2.6	4738 325.040
SK 40	32	44	53.0	200	61	4977 20.114	2.5	4738 332.040
SK 50	3	10	18.0	80	30	4904 5.016	2.6	4738 3.050
SK 50	4	10	18.0	80	35	4904 6.016	2.6	4738 4.050
SK 50	5	10	18.0	80	40	4904 8.018	2.6	4738 5.050
SK 50	6	21	27.0	80	36	4977 6.014	2.9	4738 6.050
SK 50	8	21	27.0	80	36	4977 8.014	2.9	4738 8.050
SK 50	10	24	32.0	80	41	4977 10.014	2.9	4738 10.050
SK 50	12	24	32.0	80	46	4977 12.014	2.9	4738 12.050
SK 50	14	27	34.0	80	46	4977 12.014	3.0	4738 14.050
SK 50	16	27	34.0	80	49	4977 16.014	3.0	4738 16.050
SK 50	18	33	42.0	80	49	4977 16.014	3.0	4738 18.050
SK 50	20	33	42.0	80	51	4977 20.114	3.0	4738 20.050
SK 50	25	44	53.0	100	57	4977 20.114	3.6	4738 25.050
SK 50	32	44	53.0	100	61	4977 20.114	3.5	4738 32.050
SK 50	6	21	27.0	160	36	4977 6.014	3.1	4738 106.050
SK 50	8	21	27.0	160	36	4977 8.014	3.1	4738 108.050
SK 50	10	24	32.0	160	41	4977 10.014	3.4	4738 110.050
SK 50	12	24	32.0	160	46	4977 12.014	3.4	4738 112.050
SK 50	14	27	34.0	160	46	4977 12.014	3.7	4738 114.050
SK 50	16	27	34.0	160	49	4977 16.014	3.7	4738 116.050
SK 50	18	33	42.0	160	49	4977 16.014	4.1	4738 118.050
SK 50	20	33	42.0	160	51	4977 20.114	4.1	4738 120.050
SK 50	25	44	53.0	160	57	4977 20.114	4.7	4738 125.050
SK 50	32	44	53.0	160	61	4977 20.114	4.6	4738 132.050
SK 50	6	21	27.0	200	36	4977 6.014	3.4	4738 306.050
SK 50	8	21	27.0	200	36	4977 8.014	3.4	4738 308.050
SK 50	10	24	32.0	200	41	4977 10.014	3.7	4738 310.050
SK 50	12	24	32.0	200	46	4977 12.014	3.7	4738 312.050
SK 50	14	27	34.0	200	46	4977 12.014	4.0	4738 314.050
SK 50	16	27	34.0	200	49	4977 16.014	4.0	4738 316.050
SK 50	18	33	42.0	200	49	4977 16.014	4.4	4738 318.050
SK 50	20	33	42.0	200	51	4977 20.114	4.4	4738 320.050
SK 50	25	44	53.0	200	57	4977 20.114	5.0	4738 325.050
SK 50	32	44	53.0	200	61	4977 20.114	4.9	4738 332.050

ISO taper shrink fit chucks GÜHROJET

SK

Product information:

- SK to DIN ISO 7388-1 form AD/AF
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- incl. balancing thread 4xM6/6xM6
- for tool shank tolerance h6
- axial length adjustment
- optimised cooling for tools without internal coolant
- good chip evacuation and increased process reliability
- coolant ducts: d1 = 6 - 10 mm with two coolant ducts d1 = 12 - 32 mm with four coolant ducts
- concentricity 3 µm

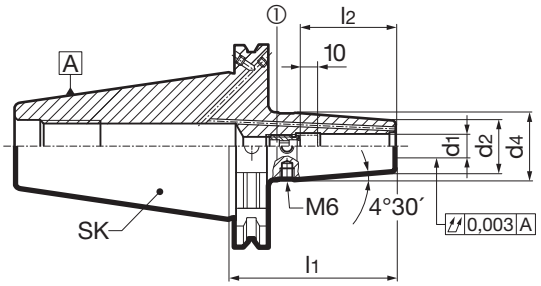
Scope of delivery:

- incl. setting screw (1) art. no. 4977

Suitable accessories separately available:

- ISO pull studs art. no. 4925, 4926

GÜHROJET





Article no. **4729**

SK	d1 h6	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
SK 40	6	21	27.0	80	36	4977 6.014	1.0	4729 6.040
SK 40	8	21	27.0	80	36	4977 8.014	1.0	4729 8.040
SK 40	10	24	32.0	80	41	4977 10.014	1.1	4729 10.040
SK 40	12	24	32.0	80	46	4977 12.014	1.0	4729 12.040
SK 40	14	27	34.0	80	46	4977 12.014	1.1	4729 14.040
SK 40	16	27	34.0	80	49	4977 16.014	1.1	4729 16.040
SK 40	18	33	42.0	80	49	4977 16.014	1.2	4729 18.040
SK 40	20	33	42.0	80	51	4977 20.114	1.5	4729 20.040
SK 50	6	21	27.0	80	36	4977 6.014	2.8	4729 6.050
SK 50	8	21	27.0	80	36	4977 8.014	2.8	4729 8.050
SK 50	10	24	32.0	80	41	4977 10.014	2.8	4729 10.050
SK 50	12	24	32.0	80	46	4977 12.014	2.8	4729 12.050
SK 50	14	27	34.0	80	46	4977 12.014	2.8	4729 14.050
SK 50	16	27	34.0	80	49	4977 16.014	2.8	4729 16.050
SK 50	18	33	42.0	80	49	4977 16.014	3.0	4729 18.050
SK 50	20	33	42.0	80	51	4977 20.114	3.0	4729 20.050
SK 50	25	44	53.0	100	57	4977 20.114	3.5	4729 25.050
SK 50	32	44	53.0	100	61	4977 20.114	3.3	4729 32.050

MAS/BT shrink fit chucks

MAS-BT

Product information:

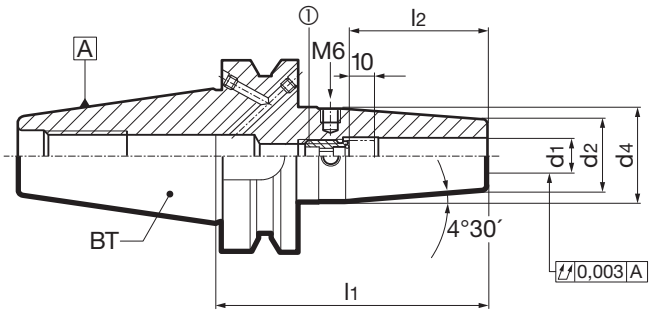
- MAS/BT to DIN ISO 7388-2 form JD/JF
- BT30 in JD design without coolant supply via the collar
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- incl. balancing thread 4xM6/6xM6
- for tool shank tolerance h6
- axial length adjustment
- concentricity: 3 µm
  l1 from 130 mm = 4 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4977 or 4904

Suitable accessories separately available:

- BT pull studs art. no. 4927, 4928
- special dimensions on request





Article no. **4739**

BT	d1	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
BT 30	3	10	18	80	30	4904 5.016	0.6	4739 3.030
BT 30	4	10	18	80	35	4904 6.016	0.6	4739 4.030
BT 30	5	10	18	80	40	4904 8.018	0.6	4739 5.030
BT 30	6	21	27	80	36	4977 6.014	0.7	4739 6.030
BT 30	8	21	27	80	36	4977 8.014	0.7	4739 8.030
BT 30	10	24	32	80	41	4977 10.014	0.8	4739 10.030
BT 30	12	24	32	80	46	4977 12.014	0.8	4739 12.030
BT 30	14	27	34	80	46	4977 12.014	0.8	4739 14.030
BT 30	16	27	34	80	49	4977 16.014	0.8	4739 16.030
BT 30	18	33	42	90	49	4977 16.014	0.9	4739 18.030
BT 30	20	33	42	90	51	4977 20.114	0.9	4739 20.030
BT 40	3	10	18	85	30	4904 5.016	1.0	4739 3.040
BT 40	4	10	18	85	35	4904 6.016	1.0	4739 4.040
BT 40	5	10	18	85	40	4904 8.018	1.0	4739 5.040
BT 40	6	21	27	90	36	4977 6.014	1.2	4739 6.040
BT 40	8	21	27	90	36	4977 8.014	1.2	4739 8.040
BT 40	10	24	32	90	41	4977 10.014	1.2	4739 10.040
BT 40	12	24	32	90	46	4977 12.014	1.2	4739 12.040
BT 40	14	27	34	90	46	4977 12.014	6.0	4739 14.040
BT 40	16	27	34	90	49	4977 16.014	1.4	4739 16.040
BT 40	18	33	42	90	49	4977 16.014	1.7	4739 18.040
BT 40	20	33	42	90	51	4977 20.114	1.7	4739 20.040
BT 40	25	44	53	100	57	4977 20.114	1.8	4739 25.040
BT 40	32	44	53	100	61	4977 20.114	1.7	4739 32.040
BT 40	6	21	27	130	36	4977 6.014	1.3	4739 6.140
BT 40	8	21	27	130	36	4977 8.014	1.2	4739 8.140
BT 40	10	24	32	130	41	4977 10.014	1.4	4739 10.140
BT 40	12	24	32	130	46	4977 12.014	1.3	4739 12.140
BT 40	14	27	34	130	46	4977 12.014	1.4	4739 14.140
BT 40	16	27	34	130	49	4977 16.014	6.3	4739 16.140
BT 40	18	33	42	130	49	4977 16.014	1.5	4739 18.140
BT 40	20	33	42	130	51	4977 20.114	1.8	4739 20.140
BT 40	25	44	53	130	57	4977 20.114	2.0	4739 25.140
BT 40	32	44	53	130	61	4977 20.114	2.2	4739 32.140
BT 50	6	21	27	100	36	4977 6.014	2.9	4739 6.050
BT 50	8	21	27	100	36	4977 8.014	2.9	4739 8.050

	Article no.	4739

BT	d1	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
BT 50	10	24	32	100	41	4977 10.014	8.9	4739 10.050
BT 50	12	24	32	100	46	4977 12.014	2.9	4739 12.050
BT 50	14	27	34	100	46	4977 12.014	3.3	4739 14.050
BT 50	16	27	34	100	49	4977 16.014	3.0	4739 16.050
BT 50	18	33	42	100	49	4977 16.014	1.9	4739 18.050
BT 50	20	33	42	100	51	4977 20.114	3.5	4739 20.050
BT 50	25	44	53	110	57	4977 20.114	9.1	4739 25.050
BT 50	32	44	53	110	61	4977 20.114	3.7	4739 32.050

MAS/BT DC shrink fit chucks with axial plane

MAS-BT

NEW

Product information:

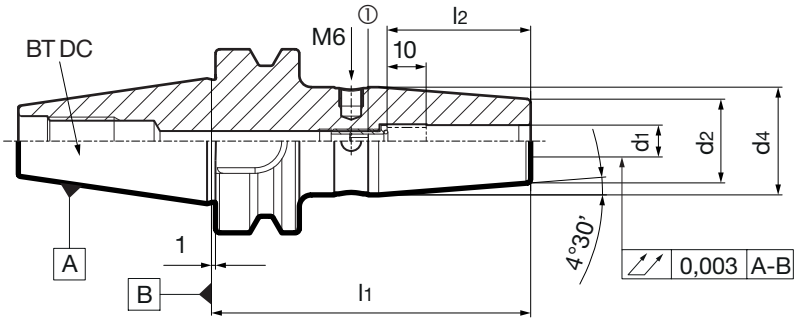
- MAS/BT DC with axial plane, sim. ISO 7388-2, form JD
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- incl. balancing thread 4xM6
- for tool shank tolerance h6
- axial length adjustment
- concentricity 3 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4904 or 4977

Suitable accessories separately available:

- BT pull studs art. no. 4927, 4928





Article no. **4790**

BT DC	d1	d2	d4	l1	l2	①		Order no.
	mm	mm	mm	mm	mm		kg	
BT 30	3	10	18	80	30	4904 5.016	0.6	4790 3.030
BT 30	4	10	18	80	35	4904 6.016	0.6	4790 4.030
BT 30	5	10	18	80	40	4904 8.018	0.6	4790 5.030
BT 30	6	21	27	80	36	4977 6.014	0.7	4790 6.030
BT 30	8	21	27	80	36	4977 8.014	0.7	4790 8.030
BT 30	10	24	32	80	41	4977 10.014	0.8	4790 10.030
BT 30	12	24	32	80	46	4977 12.014	0.8	4790 12.030
BT 30	14	27	34	80	46	4977 12.014	0.8	4790 14.030
BT 30	16	27	34	80	49	4977 16.014	0.8	4790 16.030
BT 30	18	33	42	90	49	4977 16.014	0.9	4790 18.030
BT 30	20	33	42	90	51	4977 20.114	0.9	4790 20.030

Shrink fit extensions

~HA

Product information:

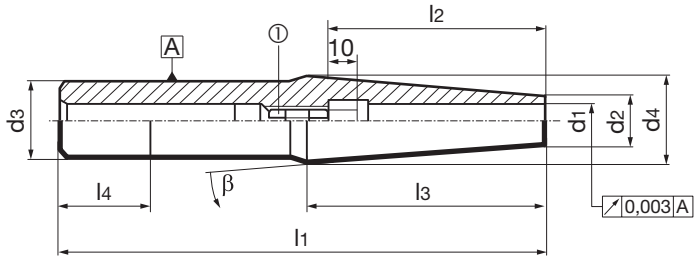
- for clamping in hydraulic chucks or shrink fit chucks
- suitable for internal cooling
- we recommend the use of special cooling adaptors art. no. 4419
- for carbide tool shanks in tolerance h6 (from d1 14 mm also HSS possible)
- with adjustment screw 10 mm adjustment range
- concentricity: 3 µm
  l1 from 115 mm = 5 µm
  l1 from 150 mm = 7 µm
  l1 from 200 mm = 9 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4977 or 4904

Suitable accessories separately available:

- special dimensions on request





Article no. **4719**

d1	d2	d3	d4	l1	l2	l3	l4	①	β		Order no.
mm	mm	mm	mm	mm	mm	mm	mm		°	kg	
3	7	16	16	115	30	64.4	50	4904 5.016	4	0.120	4719 3.016
4	7	16	16	115	35	64.4	50	4904 6.016	4	0.110	4719 4.016
5	8	16	16	115	40	57.2	57	4904 8.018	4	0.110	4719 5.016
6	10	16	16	115	36	42.9	72	4977 6.014	4	0.130	4719 6.016
8	12	16	16	115	36	28.6	86	4977 8.014	4	0.130	4719 8.016
10	14	16	16	115	41	14.3	100	4977 10.014	4	0.130	4719 10.016
12	16	16	23	115	46	51.5	55	4977 12.014	4	0.160	4719 12.016
3	7	20	16	115	30	65.0	48	4904 5.016	4	0.160	4719 3.020
4	8	20	17	115	35	65.0	48	4904 6.016	4	0.170	4719 4.020
5	9	20	18	115	40	65.0	49	4904 8.018	4	0.160	4719 5.020
6	10	20	19	115	36	65.0	49	4977 6.014	4	0.180	4719 6.020
8	12	20	20	115	36	57.2	57	4977 8.014	4	0.190	4719 8.020
10	14	20	20	115	41	42.9	72	4977 10.014	4	0.200	4719 10.020
12	16	20	20	115	46	28.6	86	4977 12.014	4	0.200	4719 12.020
14	20	20	28	150	46	62.9	82	4977 12.014	4	0.360	4719 14.020
14	20	25	28	150	46	62.9	85	4977 12.014	4	0.470	4719 14.025
16	24	25	33	150	49	64.4	81	4977 16.014	4	0.540	4719 16.025
3	10	20	20	160	30	71.5	88	4904 5.016	4	0.290	4719 3.120
4	10	20	20	160	35	71.5	88	4904 6.016	4	0.290	4719 4.120
5	10	20	20	160	40	71.5	88	4904 8.018	4	0.270	4719 5.120
6	14	20	20	160	36	42.9	117	4977 6.014	4	0.310	4719 6.120
8	14	20	20	160	36	42.9	117	4977 8.014	4	0.310	4719 8.120
10	20	25	25	160	41	35.8	124	4977 10.014	4	0.520	4719 10.125
12	20	25	25	160	46	35.8	124	4977 12.014	4	0.470	4719 12.125
14	20	25	29	160	46	62.9	85	4977 12.014	4	0.480	4719 14.125
16	22	25	33	160	49	78.7	77	4977 16.014	4	0.570	4719 16.125
18	27	32	32	160	49	35.8	124	4977 16.014	4	0.830	4719 18.132
20	27	32	32	160	51	35.8	124	4977 20.114	4	0.800	4719 20.132
3	10	20	20	200	30	71.5	128	4904 5.016	4	0.380	4719 3.220
4	10	20	20	200	35	71.5	128	4904 6.016	4	0.370	4719 4.220
5	10	20	20	200	40	71.5	128	4904 8.018	4	0.350	4719 5.220
6	14	20	20	200	36	42.9	157	4977 6.014	4	0.400	4719 6.220
8	14	20	20	200	36	42.9	157	4977 8.014	4	0.390	4719 8.220
10	20	25	25	200	41	35.8	164	4977 10.014	4	0.650	4719 10.225
12	20	25	25	200	46	35.8	164	4977 12.014	4	0.600	4719 12.225
14	20	32	32	200	46	85.8	114	4977 12.014	4	0.920	4719 14.232

									Article no.	**4719**	
d1	d2	d3	d4	l1	l2	l3	l4	①	β		**Order no.**
mm	mm	mm	mm	mm	mm	mm	mm		°	kg	
16	24	32	32	200	49	57.2	142	4977 16.014	4	1.040	4719 16.232
18	27	32	32	200	49	35.8	164	4977 16.014	4	1.070	4719 18.232
20	27	32	32	200	51	35.8	164	4977 20.114	4	1.030	4719 20.232
6	10	12	12	125	38	19.1	105		3	0.090	4719 6.012
8	12	14	14	125	38	19.1	105		3	0.120	4719 8.014
10	14	16	16	160	42	19.1	140		3	0.210	4719 10.116
12	16	20	20	160	47	38.2	121		3	0.320	4719 12.120
16	22	25	25	160	50	28.6	131		3	0.510	4719 16.225
20	27	32	32	160	52	47.7	112		3	0.820	4719 20.332
6	10	12	12	200	38	21.0	47		3	0.150	4719 6.312
8	12	14	14	200	38	21.0	47		3	0.190	4719 8.314
10	14	16	16	250	42	21.0	50		3	0.330	4719 10.316
12	16	20	20	250	47	40.1	52		3	0.480	4719 12.320
16	22	25	25	250	50	30.5	58		3	0.800	4719 16.325
20	27	32	32	250	52	49.6	62		3	1.330	4719 20.432

HSK-A hydraulic chucks, slim design 3°

HSK-A

NEW

Product information:

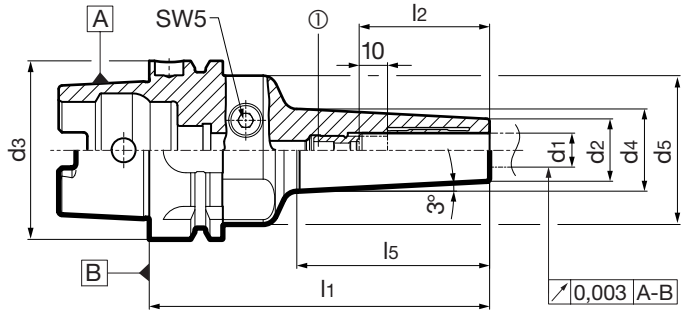
- HSK-A to ISO 12164-1 / DIN 69893-1
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for tool shank tolerance h6
- axial length adjustment
- concentricity: 3 µm
  l1 = 160 mm: max. 5 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4941
- incl. clamping key art. no. 4912

Suitable accessories separately available:

- coolant supply set art. no. 4949
- replacement clamping screws art. no. 4241
- for MQL application on request
- special dimensions on request





Article no. **4596**

d3	d1 h6	d2	d4	d5	l1	l2	l5	①		Order no.
	mm	mm	mm	mm	mm	mm	mm		kg	
HSK-A 63	6	16	23.0	52.5	120	37	67.5	4941 6.041	1.1	4596 6.163
HSK-A 63	8	18	25.0	52.5	120	37	67.5	4941 8.040	1.1	4596 8.163
HSK-A 63	10	20	27.0	52.5	120	41	67.5	4941 10.050	1.1	4596 10.163
HSK-A 63	12	22	29.0	52.5	120	46	68.0	4941 12.100	1.2	4596 12.163
HSK-A 63	14	24	31.0	52.5	120	46	68.4	4941 14.100	1.2	4596 14.163
HSK-A 63	16	26	33.0	52.5	120	49	68.9	4941 16.100	1.2	4596 16.163
HSK-A 63	18	28	35.0	52.5	120	49	69.4	4941 18.100	1.2	4596 18.163
HSK-A 63	20	30	37.0	52.5	120	51	69.7	4941 20.100	1.3	4596 20.163
HSK-A 63	6	16	27.2	52.5	160	37	108.4	4941 6.041	1.2	4596 6.263
HSK-A 63	8	18	29.2	52.5	160	37	108.4	4941 8.040	1.3	4596 8.263
HSK-A 63	10	20	31.2	52.5	160	41	108.4	4941 10.050	1.3	4596 10.263
HSK-A 63	12	22	33.3	52.5	160	46	109.0	4941 12.100	1.4	4596 12.263
HSK-A 63	14	24	35.3	52.5	160	46	109.4	4941 14.100	1.5	4596 14.263
HSK-A 63	16	26	37.4	52.5	160	49	110.0	4941 16.100	1.5	4596 16.263
HSK-A 63	18	28	39.4	52.5	160	49	110.4	4941 18.100	1.6	4596 18.263
HSK-A 63	20	30	41.5	52.5	160	51	112.0	4941 20.100	1.6	4596 20.263

HSK-A hydraulic chucks with increased clamping force

HSK-A

Product information:

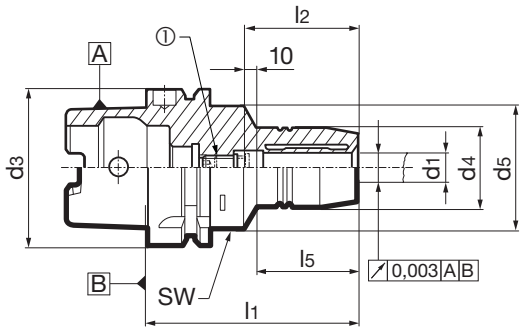
- HSK-A to ISO 12164-1 / DIN 69893-1
- dimensions to DIN 69882-7
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for tool shank tolerance h6
- axial length adjustment
- concentricity: 3 µm
  l1 from 120 mm: max. 4 µm,
  l1 from 150/160 mm: max. 5 µm,
  l1 from 200 mm: max. 7 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4900
- incl. clamping key art. no. 4912
- incl. clamping key

Suitable accessories separately available:

- coolant supply set art. no. 4949
- replacement clamping screws art. no. 4241





Article no. **4299**

d3	d1 h6	d4	d5	l1	l2	l5	SW	①		Order no.
	mm	mm	mm	mm	mm	mm	mm		kg	
HSK-A 32	6	26.0	40.0	80	37	29.0	4	4900 6.014	0.4	4299 6.032
HSK-A 32	8	28.0	40.0	80	37	29.0	4	4900 8.014	0.4	4299 8.032
HSK-A 32	10	30.0	40.0	85	41	35.0	4	4900 8.014	0.4	4299 10.032
HSK-A 32	12	32.0	40.0	90	46	40.0	4	4900 8.014	0.4	4299 12.032
HSK-A 40	6	26.0	33.5	70	37	36.0	4	4900 6.014	0.6	4299 6.040
HSK-A 40	8	28.0	33.5	70	37	36.0	4	4900 8.014	0.6	4299 8.040
HSK-A 40	10	30.0	33.5	75	41	42.0	4	4900 8.014	0.6	4299 10.040
HSK-A 40	12	32.0	33.5	80	46	48.0	4	4900 8.014	0.6	4299 12.040
HSK-A 50	6	26.0	40.0	70	37	28.0	4	4900 6.014	0.8	4299 6.050
HSK-A 50	8	28.0	40.0	70	37	28.0	4	4900 8.014	0.8	4299 8.050
HSK-A 50	10	30.0	40.0	75	41	34.0	4	4900 10.014	0.8	4299 10.050
HSK-A 50	12	32.0	40.0	85	46	44.0	4	4900 12.014	0.8	4299 12.050
HSK-A 50	14	34.0	40.0	85	46	44.0	4	4900 12.014	0.8	4299 14.050
HSK-A 50	16	38.0	53.0	90	49	30.0	5	4900 16.014	1.1	4299 16.050
HSK-A 50	18	40.0	57.0	90	49	30.0	5	4900 16.014	1.1	4299 18.050
HSK-A 50	20	42.0	60.0	90	51	29.0	5	4900 20.114	1.1	4299 20.050
HSK-A 63	6	26.0	50.0	70	37	24.5	5	4900 6.014	1.1	4299 6.063
HSK-A 63	8	28.0	50.0	70	37	25.5	5	4900 8.014	1.1	4299 8.063
HSK-A 63	10	30.0	50.0	80	41	35.5	5	4900 10.014	1.1	4299 10.063
HSK-A 63	12	32.0	50.0	85	46	41.5	5	4900 12.014	1.1	4299 12.063
HSK-A 63	14	34.0	50.0	85	46	41.5	5	4900 12.014	1.2	4299 14.063
HSK-A 63	16	38.0	50.0	90	49	45.5	5	4900 16.014	1.3	4299 16.063
HSK-A 63	18	40.0	50.0	90	49	48.5	5	4900 16.014	1.3	4299 18.063
HSK-A 63	20	42.0	50.0	90	51	47.5	5	4900 20.114	1.3	4299 20.063
HSK-A 63	25	57.0	63.0	120	57	55.3	6	4900 20.114	2.3	4299 25.063
HSK-A 63	32	64.0	75.0	125	61	63.0	6	4900 20.114	2.9	4299 32.063
HSK-A 63	6	26.0	50.0	150	37	103.0	5	4900 6.014	1.5	4299 6.163
HSK-A 63	8	28.0	50.0	150	37	104.0	5	4900 8.014	1.5	4299 8.163
HSK-A 63	10	30.0	50.0	150	41	104.0	5	4900 10.014	1.5	4299 10.163
HSK-A 63	12	32.0	50.0	150	46	105.0	5	4900 12.014	1.5	4299 12.163
HSK-A 63	14	34.0	50.0	150	46	105.0	5	4900 12.014	1.7	4299 14.163
HSK-A 63	16	38.0	50.0	150	49	106.0	5	4900 16.014	1.8	4299 16.163
HSK-A 63	18	40.0	50.0	150	49	107.0	5	4900 16.014	1.9	4299 18.163
HSK-A 63	20	42.0	50.0	150	51	108.0	5	4900 20.114	1.9	4299 20.163
HSK-A 63	6	26.0	50.0	200	37	153.0	5	4900 6.014	1.7	4299 6.263
HSK-A 63	8	28.0	50.0	200	37	154.0	5	4900 8.014	1.7	4299 8.263

	Article no.	4299

d3	d1 h6	d4	d5	l1	l2	l5	SW	①		Order no.
	mm	mm	mm	mm	mm	mm	mm		kg	
HSK-A 63	10	30.0	50.0	200	41	154.0	5	4900 10.014	1.8	4299 10.263
HSK-A 63	12	32.0	50.0	200	46	155.0	5	4900 12.014	1.8	4299 12.263
HSK-A 63	14	34.0	50.0	200	46	155.0	5	4900 12.014	2.1	4299 14.263
HSK-A 63	16	38.0	50.0	200	49	156.0	5	4900 16.014	2.2	4299 16.263
HSK-A 63	18	40.0	50.0	200	49	157.0	5	4900 16.014	2.3	4299 18.263
HSK-A 63	20	42.0	50.0	200	51	158.0	5	4900 20.114	2.5	4299 20.263
HSK-A 80	6	26.0	50.0	70	37	24.0	5	4900 6.014	1.5	4299 6.080
HSK-A 80	8	28.0	50.0	70	37	24.0	5	4900 8.014	1.5	4299 8.080
HSK-A 80	10	30.0	50.0	80	41	35.0	5	4900 10.014	1.5	4299 10.080
HSK-A 80	12	32.0	50.0	85	46	40.0	5	4900 12.014	1.6	4299 12.080
HSK-A 80	14	34.0	50.0	85	46	40.0	5	4900 12.014	1.6	4299 14.080
HSK-A 80	16	38.0	50.0	95	49	51.0	5	4900 16.014	1.7	4299 16.080
HSK-A 80	18	40.0	50.0	95	49	51.0	5	4900 16.014	1.8	4299 18.080
HSK-A 80	20	42.0	50.0	95	51	52.0	5	4900 20.114	1.8	4299 20.080
HSK-A 80	25	57.0	63.0	110	57	65.0	6	4900 20.114	2.6	4299 25.080
HSK-A 80	32	64.0	75.0	125	61	63.0	6	4900 20.114	3.2	4299 32.080
HSK-A 100	6	26.0	50.0	75	37	24.0	5	4900 6.014	2.4	4299 6.100
HSK-A 100	8	28.0	50.0	75	37	26.0	5	4900 8.014	2.4	4299 8.100
HSK-A 100	10	30.0	50.0	90	41	42.0	5	4900 10.014	2.5	4299 10.100
HSK-A 100	12	32.0	50.0	95	46	47.0	5	4900 12.014	2.5	4299 12.100
HSK-A 100	14	34.0	50.0	95	46	47.0	5	4900 12.014	2.5	4299 14.100
HSK-A 100	16	38.0	50.0	100	49	53.0	5	4900 16.014	2.7	4299 16.100
HSK-A 100	18	40.0	50.0	100	49	53.0	5	4900 16.014	2.7	4299 18.100
HSK-A 100	20	42.0	50.0	105	51	59.0	5	4900 20.114	3.2	4299 20.100
HSK-A 100	25	57.0	63.0	110	57	62.0	6	4900 20.114	3.3	4299 25.100
HSK-A 100	32	64.0	75.0	110	61	62.0	6	4900 20.114	3.8	4299 32.100
HSK-A 100	6	26.0	50.0	160	37	104.0	5	4900 6.014	2.8	4299 106.100
HSK-A 100	8	28.0	50.0	160	37	104.0	5	4900 8.014	2.8	4299 108.100
HSK-A 100	10	30.0	50.0	160	41	105.0	5	4900 10.014	2.9	4299 110.100
HSK-A 100	12	32.0	50.0	160	46	105.0	5	4900 12.014	2.9	4299 112.100
HSK-A 100	14	34.0	50.0	160	46	107.0	5	4900 12.014	2.9	4299 114.100
HSK-A 100	16	38.0	50.0	160	49	107.0	5	4900 16.014	3.2	4299 116.100
HSK-A 100	18	40.0	50.0	160	49	108.0	5	4900 16.014	3.2	4299 118.100
HSK-A 100	20	42.0	50.0	160	51	108.0	5	4900 20.114	3.6	4299 120.100
HSK-A 100	25	57.0	63.0	160	57	110.0	6	4900 20.114	3.7	4299 125.100
HSK-A 100	32	64.0	75.0	160	61	110.0	6	4900 20.114	4.2	4299 132.100
HSK-A 100	6	26.0	50.0	200	37	144.0	5	4900 6.014	3.0	4299 206.100
HSK-A 100	8	28.0	50.0	200	37	144.0	5	4900 8.014	3.0	4299 208.100
HSK-A 100	10	30.0	50.0	200	41	145.0	5	4900 10.014	3.1	4299 210.100
HSK-A 100	12	32.0	50.0	200	46	145.0	5	4900 12.014	3.1	4299 212.100
HSK-A 100	14	34.0	50.0	200	46	147.0	5	4900 12.014	3.1	4299 214.100
HSK-A 100	16	38.0	50.0	200	49	147.0	5	4900 16.014	3.4	4299 216.100
HSK-A 100	18	40.0	50.0	200	49	148.0	5	4900 16.014	3.4	4299 218.100
HSK-A 100	20	42.0	50.0	200	51	148.0	5	4900 20.114	3.8	4299 220.100
HSK-A 100	25	57.0	63.0	200	57	150.0	6	4900 20.114	3.9	4299 225.100
HSK-A 100	32	64.0	75.0	200	61	150.0	6	4900 20.114	4.4	4299 232.100

ISO taper hydraulic chucks, slim design 3°



NEW

Product information:

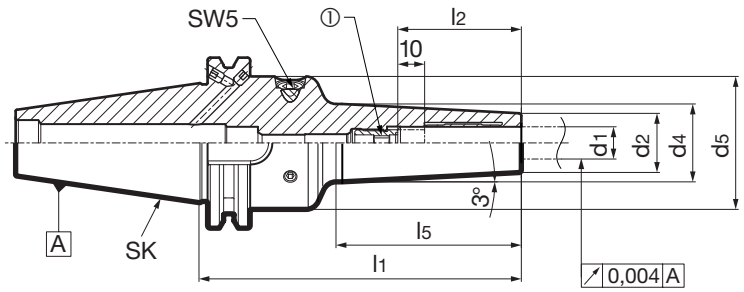
- SK to DIN ISO 7388-1 form AD/AF
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for tool shank tolerance h6
- axial length adjustment
- concentricity: 4 µm
  l1 from 160 mm: = 5 µm

Scope of delivery:

- incl. setting screw (1) art. no. 4941
- incl. clamping key art. no. 4912

Suitable accessories separately available:

- ISO pull studs art. no. 4925, 4926
- replacement clamping screws art. no. 4241





Article no. **4597**

SK	d1 h6	d2	d4	d5	l1	l2	l5	①		Order no.
	mm	mm	mm	mm	mm	mm	mm		kg	
SK 40	6	16	23.0	49.5	120	37	68.0	4941 6.041	1.3	4597 6.140
SK 40	8	18	25.0	49.5	120	37	68.0	4941 8.040	1.3	4597 8.140
SK 40	10	20	27.0	49.5	120	41	68.5	4941 10.050	1.3	4597 10.140
SK 40	12	22	29.0	49.5	120	46	69.0	4941 12.100	1.4	4597 12.140
SK 40	14	24	31.0	49.5	120	46	69.0	4941 14.100	1.4	4597 14.140
SK 40	16	26	33.0	49.5	120	49	69.5	4941 16.100	1.4	4597 16.140
SK 40	18	28	35.0	49.5	120	49	70.0	4941 18.100	1.4	4597 18.140
SK 40	20	30	37.0	49.5	120	51	70.0	4941 20.100	1.5	4597 20.140
SK 40	6	16	27.3	49.5	160	37	109.0	4941 6.041	1.4	4597 6.240
SK 40	8	18	29.3	49.5	160	37	109.0	4941 8.040	1.5	4597 8.240
SK 40	10	20	31.4	49.5	160	41	110.0	4941 10.050	1.5	4597 10.240
SK 40	12	22	33.5	49.5	160	46	111.0	4941 12.100	1.6	4597 12.240
SK 40	14	24	35.6	49.5	160	46	112.0	4941 14.100	1.7	4597 14.240
SK 40	16	26	37.6	49.5	160	49	112.0	4941 16.100	1.7	4597 16.240
SK 40	18	28	39.8	49.5	160	49	114.0	4941 18.100	1.8	4597 18.240
SK 40	20	30	41.8	49.5	160	51	114.0	4941 20.100	1.8	4597 20.240

ISO taper hydraulic chucks with increased clamping force



Product information:

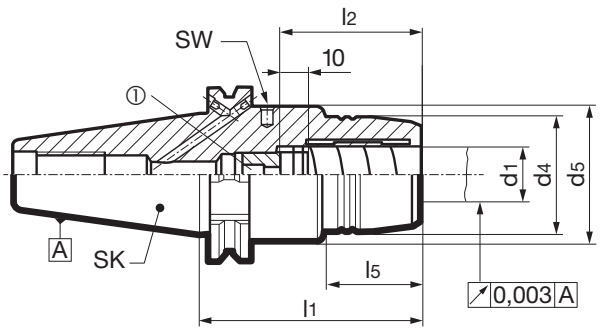
- SK to DIN ISO 7388-1 form AD/AF
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for tool shank tolerance h6
- axial length adjustment

Scope of delivery:

- incl. setting screw (1) art. no. 4900
- incl. clamping key art. no. 4912

Suitable accessories separately available:

- ISO pull studs art. no. 4925, 4926
- replacement clamping screws art. no. 4241





Article no. **4213**

SK	d1 h6	d4	d5	l1	l2	l5	SW	①		Order no.
	mm	mm	mm	mm	mm	mm	mm		kg	
SK 40	6	26.0	49.5	80.5	37	29.5	5	4900 6.014	1.2	4213 6.040
SK 40	8	28.0	49.5	80.5	37	30.0	5	4900 8.014	1.2	4213 8.040
SK 40	10	30.0	49.5	80.5	41	31.0	5	4900 10.014	1.3	4213 10.040
SK 40	12	32.0	49.5	80.5	46	31.5	5	4900 12.014	1.3	4213 12.040
SK 40	14	34.0	49.5	80.5	46	31.5	5	4900 12.014	1.3	4213 14.040
SK 40	16	38.0	49.5	80.5	49	33.0	5	4900 16.014	1.3	4213 16.040
SK 40	18	40.0	49.5	80.5	49	33.0	5	4900 16.014	1.3	4213 18.040
SK 40	20	49.5	49.5	64.5	51	45.4	5	4900 20.114	1.7	4213 20.040
SK 40	20	42.0	49.5	80.5	51	34.0	5	4900 20.114	1.3	4213 20.140
SK 40	20	42.0	49.5	110.0	51	34.0	5	4900 20.114	1.7	4213 20.240
SK 40	25	49.5	49.5	80.5	57	61.4	6	4900 20.114	1.3	4213 25.040
SK 40	32	63.0	80.0	80.5	61	25.5	6	4900 20.114	1.8	4213 32.040
SK 50	12	32.0	49.5	80.5	46	31.5	5	4900 12.014	3.1	4213 12.050
SK 50	20	42.0	49.5	80.5	51	34.0	5	4900 20.114	3.1	4213 20.050
SK 50	20	42.0	49.5	110.0	51	34.0	5	4900 20.114	3.6	4213 20.150
SK 50	32	72.0	72.0	81.0	61	61.9	6	4900 20.114	3.8	4213 32.050

MAS/BT hydraulic chucks with increased clamping force

MAS-BT

Product information:

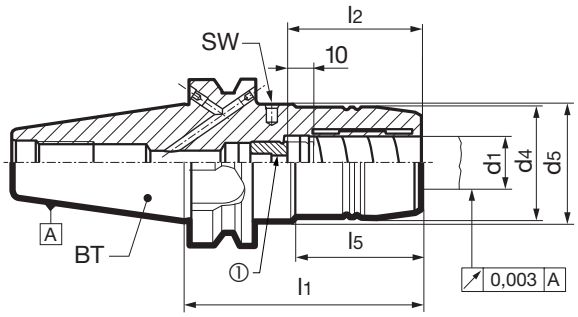
- MAS/BT to DIN ISO 7388-2 Form JD/JF
- BT30 in JD design without coolant supply via the collar
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for tool shank tolerance h6
- axial length adjustment

Scope of delivery:

- incl. setting screw (1) art. no. 4900
- incl. clamping key art. no. 4912

Suitable accessories separately available:

- BT pull studs art. no. 4927, 4928
- replacement clamping screws art. no. 4241





Article no. **4221**

BT	d1 h6	d4	d5	l1	l2	l5	SW	①		Order no.
	mm	mm	mm	mm	mm	mm	mm		kg	
BT 30	6	26.0	26.0	51.0	37		4	4900 6.014	0.4	4221 6.030
BT 30	8	28.0	28.0	51.0	37		4	4900 8.014	0.4	4221 8.030
BT 30	10	30.0	30.0	51.0	41		4	4900 10.014	0.4	4221 10.030
BT 30	12	32.0	32.0	51.0	46	19.5	4	4900 12.014	0.5	4221 12.030
BT 30	16	38.0	38.0	90.0	49	50.0	4	4900 16.014	0.8	4221 16.030
BT 30	20	42.0	42.0	90.0	51	50.0	5	4900 8.014	0.9	4221 20.030
BT 40	6	26.0	44.5	90.0	37	43.0	5	4900 6.014	1.2	4221 6.040
BT 40	8	28.0	44.5	90.0	37	44.5	5	4900 8.014	1.3	4221 8.040
BT 40	10	30.0	44.5	90.0	41	44.5	5	4900 10.014	1.3	4221 10.040
BT 40	12	32.0	44.5	90.0	46	44.5	5	4900 12.014	1.3	4221 12.040
BT 40	14	34.0	44.5	90.0	46	44.5	5	4900 12.014	1.3	4221 14.040
BT 40	16	38.0	44.5	90.0	49	47.5	5	4900 16.014	1.3	4221 16.040
BT 40	18	40.0	44.5	90.0	49	47.5	5	4900 16.014	1.4	4221 18.040
BT 40	20	49.5	49.5	72.5	51		5	4900 20.114	1.4	4221 20.040
BT 40	20	42.0	44.5	90.0	51	47.5	5	4900 20.114	1.4	4221 20.140
BT 40	25	49.5	49.5	83.0	57		6	4900 20.114	1.4	4221 25.040
BT 40	32	63.0	80.0	83.0	61	25.5	6	4900 20.114	1.9	4221 32.040
BT 50	12	32.0	44.5	90.0	46	34.0	5	4900 12.014	3.9	4221 12.050
BT 50	20	42.0	44.5	90.0	51	34.0	5	4900 20.114	3.9	4221 20.050
BT 50	32	72.0	72.0	90.0	61		6	4900 20.114	4.6	4221 32.050

MAS/BT DC hydraulic chucks with axial plane

MAS-BT

NEW

Product information:

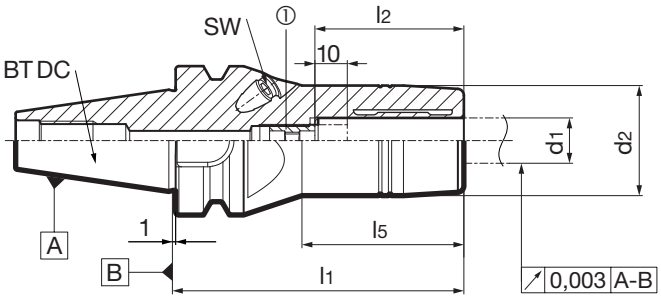
- MAS/BT DC with axial plane, sim. ISO 7388-2, form JD
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for tool shank tolerance h6
- axial length adjustment

Scope of delivery:

- incl. setting screw (1) art. no. 4900
- incl. clamping key art. no. 4912

Suitable accessories separately available:

- BT pull studs art. no. 4927, 4928
- replacement clamping screws art. no. 4241





Article no. **4598**

BT DC	d1	d2	l1	l2	l5	SW	①		Order no.
	mm	mm	mm	mm	mm	mm		kg	
BT 30	6	26	51	37	29	4	4900 6.014	0.4	4598 6.030
BT 30	8	28	51	37	29	4	4900 8.014	0.4	4598 8.030
BT 30	10	30	51	41	29	4	4900 10.014	0.5	4598 10.030
BT 30	12	32	51	46	19	4	4900 12.014	0.5	4598 12.030
BT 30	14	34	90	46	50	4	4900 12.014	0.8	4598 14.030
BT 30	16	38	90	49	50	4	4900 16.014	0.8	4598 16.030
BT 30	18	40	90	49	50	5	4900 16.014	0.9	4598 18.030
BT 30	20	42	90	51	50	5	4900 20.114	0.9	4598 20.030

HSK-A precision clamping chucks

HSK-A

Product information:

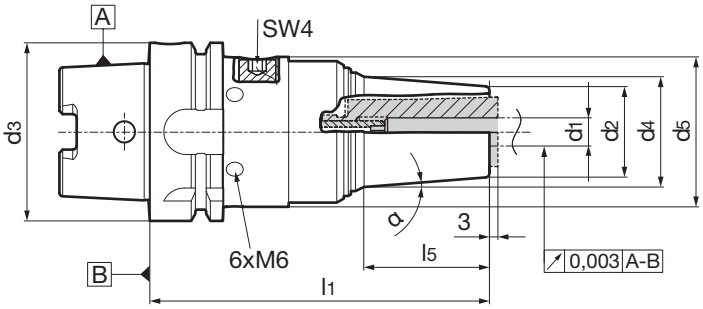
- HSK-A to ISO 12164-1 / DIN 69893-1
- balance quality values: G 2.5 / 20,000 U/min or U < 1.2 gmm
- incl. balancing thread 6xM6
- for tool shank tolerance h6
- axial length adjustment
- for heavy-duty cutting as well as HSC and HPC
- highest clamping force and stability thanks to mech. tension gearing
- actuation torque for clamping initiation 10 Nm
- suitable for internal cooling up to 80 bar

Scope of delivery:

- hexagon clamping key art. no. 4912 4,600

Suitable accessories separately available:

- coolant supply set art. no. 4949
- clamping sleeves art. no. 4302, 4235, 4236, 4237
- torque wrench 10 Nm art. no. 4987 10.000
- sockets art. no. 4916 4.000 for optimal operation





Article no. **4300**

d3	Nominal size	d1 h6	d2	d4	d5	l1	l5	α	Order no.
		mm	mm	mm	mm	mm	mm	°	
HSK-A 63	20	3.0-20.0	40	40	53	92	20		4300 20.063
HSK-A 63	20	3.0-20.0	32	39	53	120	44	4	4300 20.163
HSK-A 63	20	3.0-20.0	32	40	53	142	69	4	4300 20.263
HSK-A 100	20	3.0-20.0	40	40	70	100	18		4300 20.100
HSK-A 100	25	16.0-32.0	52	70	70	139	15		4300 25.100

ISO taper precision clamping chucks



Product information:

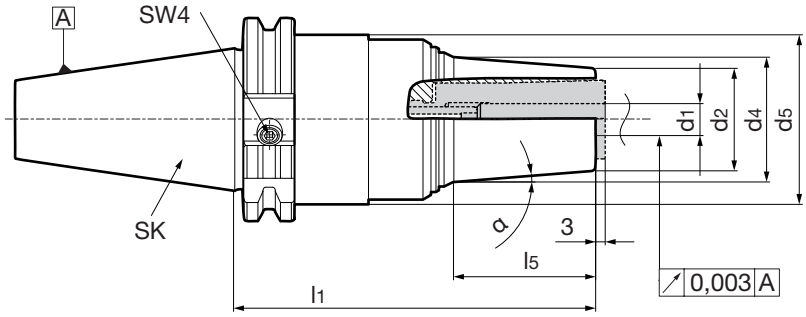
- SK to DIN ISO 7388-1 Form AD
- balance quality values: G 2.5 / 20,000 U/min or U < 1.2 gmm
- for tool shank tolerance h6
- axial length adjustment
- for heavy-duty cutting as well as HSC and HPC
- highest clamping force and stability thanks to mech. tension gearing
- actuation torque for clamping initiation 10 Nm
- suitable for internal cooling up to 80 bar

Scope of delivery:

- hexagon clamping key art. no. 4912 4,600

Suitable accessories separately available:

- clamping sleeves art. no. 4302, 4235, 4236, 4237
- ISO pull studs art. no. 4925, 4926
- torque wrench 10 Nm art. no. 4987 10.000
- sockets art. no. 4916 4.000 for optimal operation
- form AD/AF on request





	Article no.	4301

SK	Nominal size	d1 h6	d2	d4	d5	l1	l5	α	Order no.
		mm	mm	mm	mm	mm	mm	°	
SK 40	20	3.0-20.0	40	40	50	62	20		4301 20.040
SK 40	20	3.0-20.0	32	39	50	91	44	4	4301 20.140
SK 40	20	3.0-20.0	32	40	50	112	69	4	4301 20.240
SK 50	20	3.0-20.0	40	40	63	62	18		4301 20.050
SK 50	25	16.0-32.0	52	70	70	101	15		4301 25.050

MAS/BT precision clamping chucks



Product information:

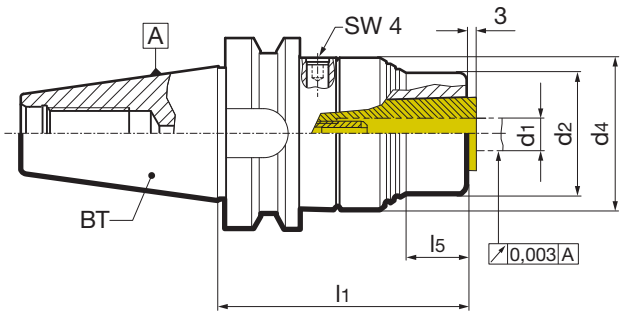
- MAS/BT to DIN ISO 7388-2 form JD
- balancing quality: G 2.5 / 25,000 rev./min or rev. < 1 gmm
- for tool shank tolerance h6
- axial length adjustment
- for heavy-duty cutting as well as HSC and HPC
- highest clamping force and stability thanks to mech. tension gearing
- actuation torque for clamping initiation 10 Nm
- suitable for internal cooling up to 80 bar

Scope of delivery:

- hexagon clamping key art. no. 4912 4,600

Suitable accessories separately available:

- clamping sleeves art. no. 4302, 4235, 4236, 4237
- BT pull studs art. no. 4927, 4928
- torque wrench 10 Nm art. no. 4987 10.000
- sockets art. no. 4916 4.000 for optimal operation
- form JD/JF on request





	Article no.	4244

BT	Nominal size	d1 h6	d2	d4	l1	l5	Order no.
		mm	mm	mm	mm	mm	
BT 30	20	3.0-20.0	40.0	53	82.0	20	4244 20.030
BT 40	20	3.0-20.0	40.0	63	70.4	18	4244 20.040
BT 40	25	16.0-32.0	53.0	63	109.5	14	4244 25.040
BT 40	20	3.0-20.0	40.0	63	120.0	48	4244 120.040
BT 50	20	3.0-20.0	40.0	63	81.4	18	4244 20.050
BT 50	25	16.0-32.0	52.5	70	120.5	10	4244 25.050
BT 50	20	3.0-20.0	40.0	63	167.4	84	4244 120.050

Extensions HPC

HA

Product information:

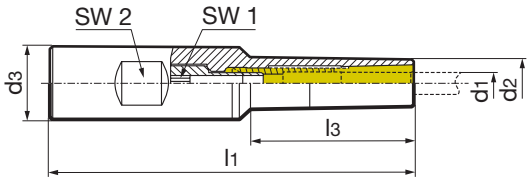
- for tool shank tolerance h6
- slim extension for holding in HPC chuck or hydraulic chuck
- high clamping force
- actuation from the rear using the hexagonal key provided (SW1)
- actuation torque for clamping initiation 3 Nm

Scope of delivery:

- hexagon clamping key art. no. 4912 4,000

Suitable accessories separately available:

- clamping sleeves art. no. 4302, 4235
- torque wrench art. no. 4915 3,000 for optimal operation





	Article no.	4208

d3	Size	d1	d2	l1	l3	SW1	SW2		Order no.
mm		mm	mm	mm	mm	mm	mm	kg	
14	6	1.0-6.0	14	100	29	4	13	0.260	4208 6.014
20	6	1.0-6.0	14	100	45	4	16	0.340	4208 6.020
14	6	1.0-6.0	14	150	29	4	13	0.320	4208 6.114
20	6	1.0-6.0	14	150	67	4	16	0.460	4208 6.120

GÜHROJET clamping sleeves, for precision clamping chucks

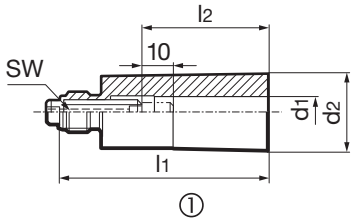
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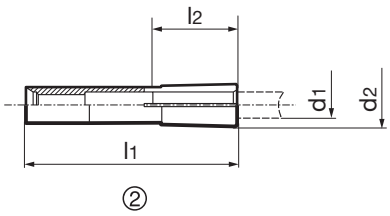
- for clamping tools with straight shank
- for maximum holding torque
- design with peripheral cooling thanks to long slots
- for tool shank tolerance h6
- Type 1: for HPC power chuck
  Type 2: for HPC extensions
- Type P: PinLock pull-out safety device incl. 3 securing pins and assembly tool (design without adjustment track)

Scope of delivery:

- incl. adjustment screw for type 1 and type P

GÜHROJET







Article no. **4302**

Nominal size	d1 h6	d2	l1	l2	Type	SW	Order no.
	mm	mm	mm	mm		mm	
6	1	10.0	50.0	28	2		4302 1.006
6	2	10.0	50.0	28	2		4302 2.006
6	3	10.0	50.0	28	2		4302 3.006
6	4	10.0	50.0	28	2		4302 4.006
6	5	10.0	50.0	28	2		4302 5.006
6	6	10.0	50.0	28	2		4302 6.006
20	6	24.6	66.0	36	1&P	4	4302 6.120
20	8	24.6	66.0	36	1&P	4	4302 8.120
20	10	24.6	66.0	40	1&P	4	4302 10.120
20	12	24.6	66.0	45	1&P	4	4302 12.120
20	14	24.6	66.0	45	1&P	4	4302 14.120
20	16	24.6	66.0	48	1&P	4	4302 16.120
20	18	24.6	66.0	48	1&P	4	4302 18.120
20	20	24.6	66.0	50	1&P	4	4302 20.120
25	16	39.0	87.5	48	1&P	5	4302 16.125
25	20	39.0	87.5	50	1&P	5	4302 20.125
25	22	39.0	87.5	50	1&P	5	4302 22.125
25	25	39.0	87.5	56	1&P	5	4302 25.125
20	3	24.6	66.0	28	1	4	4302 3.020
20	4	24.6	66.0	28	1	4	4302 4.020
20	5	24.6	66.0	28	1	4	4302 5.020
20	6	24.6	66.0	36	1	4	4302 6.020
20	8	24.6	66.0	36	1	4	4302 8.020
20	10	24.6	66.0	40	1	4	4302 10.020
20	12	24.6	66.0	45	1	4	4302 12.020
20	14	24.6	66.0	45	1	4	4302 14.020
20	16	24.6	66.0	48	1	4	4302 16.020
20	18	24.6	66.0	48	1	4	4302 18.020
20	20	24.6	66.0	50	1	4	4302 20.020
25	16	39.0	87.5	48	1	5	4302 16.025
25	20	39.0	87.5	50	1	5	4302 20.025
25	22	39.0	87.5	50	1	5	4302 22.025
25	25	39.0	87.5	56	1	5	4302 25.025
25	32	39.0	87.5	59	1	5	4302 32.025

Clamping sleeves for precision clamping chucks, sealed version

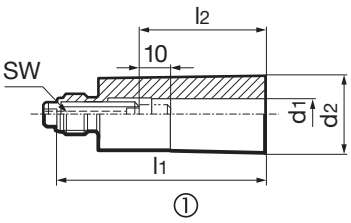
~HA

Product information:

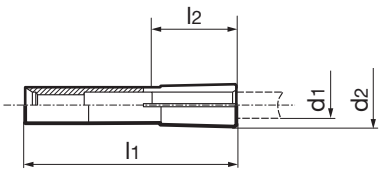
- for clamping tools with straight shank
- high holding torque
- sealed design with short slots
- for tool shank tolerance h6
- Type 1: for HPC power chuck
  Type 2: for HPC extensions

Scope of delivery:

- incl. adjustment screw



①



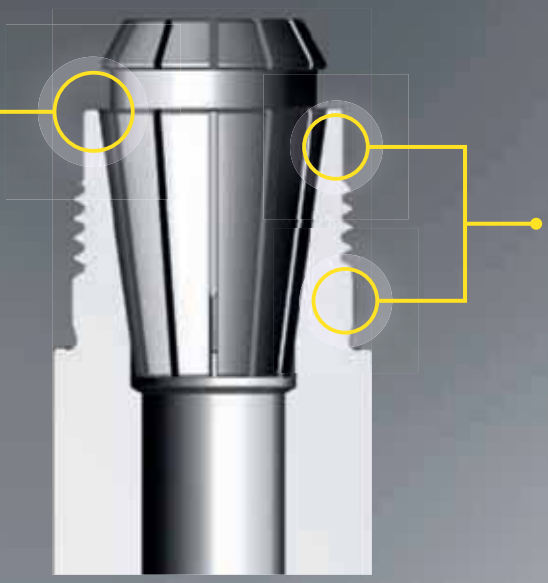
②

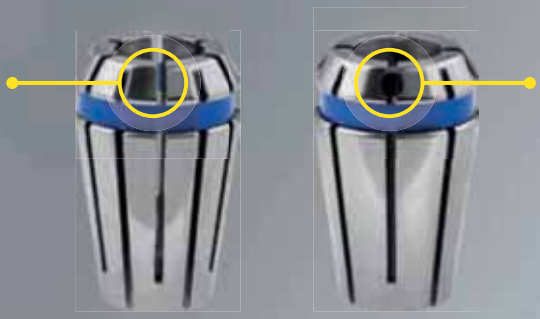


Article no. **4235**

Nominal size	d1 h6	d2	l1	l2	Type	SW	Order no.
	mm	mm	mm	mm		mm	
6	1	10.0	50.0	28	2		4235 1.006
6	2	10.0	50.0	28	2		4235 2.006
6	3	10.0	50.0	28	2		4235 3.006
6	4	10.0	50.0	28	2		4235 4.006
6	5	10.0	50.0	28	2		4235 5.006
6	6	10.0	50.0	28	2		4235 6.006
20	3	24.6	66.0	28	1	4	4235 3.020
20	4	24.6	66.0	28	1	4	4235 4.020
20	5	24.6	66.0	28	1	4	4235 5.020
20	6	24.6	66.0	36	1	4	4235 6.020
20	8	24.6	66.0	36	1	4	4235 8.020
20	10	24.6	66.0	40	1	4	4235 10.020
20	12	24.6	66.0	45	1	4	4235 12.020
20	14	24.6	66.0	45	1	4	4235 14.020
20	16	24.6	66.0	48	1	4	4235 16.020
20	18	24.6	66.0	48	1	4	4235 18.020
20	20	24.6	66.0	50	1	4	4235 20.020
25	16	39.0	87.5	48	1	5	4235 16.025
25	20	39.0	87.5	50	1	5	4235 20.025
25	22	39.0	87.5	50	1	5	4235 22.025
25	25	39.0	87.5	56	1	5	4235 25.025
25	32	39.0	87.5	59	1	5	4235 32.025

Precision collet holders





+ *maximum concentricity and minimum imbalance for highest speeds, especially for the micro tool range*
+ *easy handling for quick tool change*
+ *low imbalance, protects the machine and ensures perfect surfaces during machining*
+ *completely rotation-symmetrical structure*
+ *holder with HSK-A or HSK-E*

HSK-A precision collet holders

HSK-A

NEW

Product information:

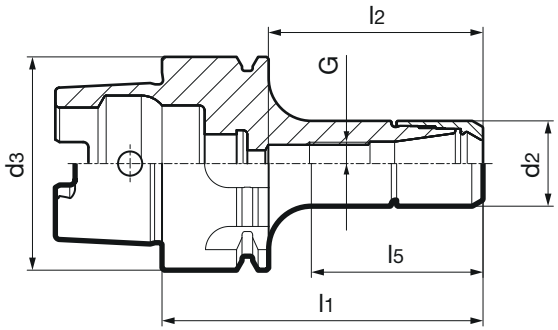
- HSK-A to ISO 12164-1 / DIN 69893-1
- balancing quality: G 2.5 / 25,000 rev./min or rev. ≤ 1 gmm
- für precision collets art. no. 4574 and 4575
- concentricity overall system max. 3 µm (at 3 x clamping-Ø max. 50 mm)
- observe maximum torque values of clamping nut clamping Ø 1.0 - 2.5 = 7 Nm clamping Ø 3.0 - 7.5 = 10 Nm

Scope of delivery:

- incl. retaining nut art. no. 4573
- without setting screws

Suitable accessories separately available:

- coolant supply set art. no. 4949
- order collets art. no. 4574 or 4575 (sealed version) separately
- roller bearing wrench art. no. 4994
- torque wrench art. no. 4981 5.025
- roller bearing wrench head art. no. 4995 for optimal operation





Article no. **4476**

d3	Size	Ø-range	d2	l1	l2	l5		G	Order no.
			mm	mm	mm	mm	1/min		
HSK-A 32	ER11	1.0-7.0	16	40	24	20	50000		4476 11.032
HSK-A 40	ER11	1.0-7.0	16	60	40	40	42000	M 8 X1	4476 11.040
HSK-A 40	ER11	1.0-7.0	16	130	75	110	27000	M 8 X1	4476 11.140
HSK-A 50	ER11	1.0-7.0	16	130	60	104	27000	M 8 X1	4476 11.050
HSK-A 63	ER11	1.0-7.0	16	70	48	34	25000	M 8 X1	4476 11.063
HSK-A 63	ER11	1.0-7.0	16	100	78	64	25000	M 8 X1	4476 11.163
HSK-A 63	ER11	1.0-7.0	16	130	108	94	25000	M 8 X1	4476 11.263
HSK-A 63	ER11	1.0-7.0	16	160	138	124	25000	M 8 X1	4476 11.363

HSK-E precision collet holders

HSK-E

NEW

Product information:

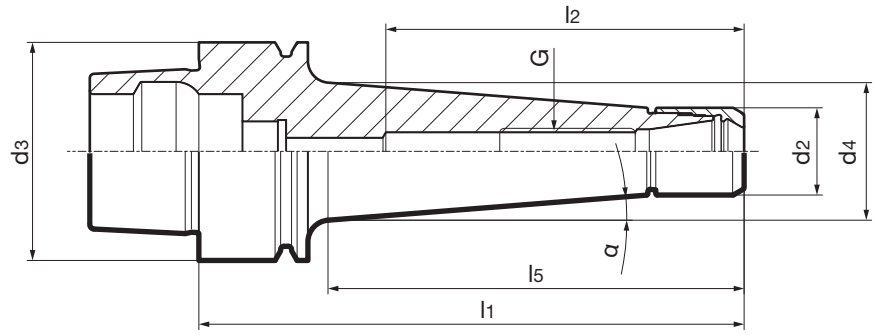
- HSK-E to DIN 69893-5, without access hole in taper
- balancing quality: G 2.5 / 25,000 rev./min or rev. ≤ 1 gmm
- für precision collets art. no. 4574 and 4575
- concentricity overall system max. 3 µm (at 3 x clamping-Ø max. 50 mm)
- observe maximum torque values of clamping nut clamping Ø 1.0 - 2.5 = 7 Nm clamping Ø 3.0 - 7.5 = 10 Nm

Scope of delivery:

- incl. retaining nut art. no. 4573
- without setting screws

Suitable accessories separately available:

- coolant supply set art. no. 4949
- order collets art. no. 4574 or 4575 (sealed version) separately
- roller bearing wrench art. no. 4994
- torque wrench art. no. 4981 5.025
- roller bearing wrench head art. no. 4995 for optimal operation





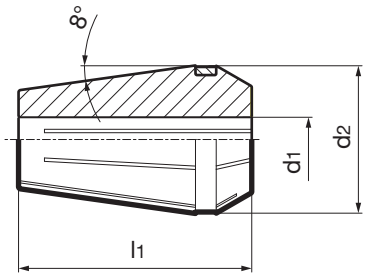
Article no. **4475**

d3	Size	Ø-range	d2	d4	l1	l2	l5	α		G	Order no.
			mm	mm	mm	mm	mm	°	1/min		
HSK-E 25	ER11	1,0-7,5	16	20.0	35	22	22.0		60000		4475 11.025
HSK-E 32	ER11	1,0-7,5	16	17.5	50	34	27.5	4.5	50000	M 8 X1	4475 11.032
HSK-E 40	ER11	1,0-7,5	16	17.0	50	31	22.5	4.5	42000	M 8 X1	4475 11.040
HSK-E 40	ER11	1,0-7,5	16	25.5	100	65	75.5	4.5	40000	M 8 X1	4475 11.140
HSK-E 40	ER11	1,0-7,5	16	30.5	130	65	108.0	4.5	35000	M 8 X1	4475 11.240
HSK-E 40	ER11	1,0-7,5	16	32.0	160	65	139.0	4.5	27000	M 8 X1	4475 11.340
HSK-E 50	ER11	1,0-7,5	16	18.0	60	37	30.0	4.5	30000	M 8 X1	4475 11.050
HSK-E 50	ER11	1,0-7,5	16	24.5	100	73	70.0	4.5	30000	M 8 X1	4475 11.150

Precision collets for precision collet holders

Product information:

- for tool shank tolerance h10
- precision collet holders ER11 sim. ISO 15488
- especially for precision collet holders art. no. 4475 and 4476
- concentricity 2 µm
- no clamping bridging
- observe maximum torque values of clamping nut
  clamping Ø 1.0 - 2.5 = 7 Nm
  clamping Ø 3.0 - 7.5 = 10 Nm
- sealed design art. no. 4575





Article no. **4574**

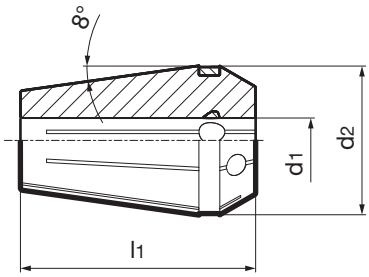
Size	d1	d2	l1	Order no.
	mm	mm	mm	
ER11	1.00	11.3	18.00	4574 1.011
ER11	1.50	11.3	18.00	4574 1.511
ER11	2.00	11.3	18.00	4574 2.011
ER11	2.50	11.3	18.00	4574 2.511
ER11	3.00	11.3	18.00	4574 3.011
ER11	3.50	11.3	18.00	4574 3.511
ER11	4.00	11.3	18.00	4574 4.011
ER11	4.50	11.3	18.00	4574 4.511
ER11	5.00	11.3	18.00	4574 5.011
ER11	5.50	11.3	18.00	4574 5.511
ER11	6.00	11.3	18.00	4574 6.011
ER11	6.50	11.3	18.00	4574 6.511
ER11	7.00	11.3	18.00	4574 7.011

Precision collets for precision collet holders, sealed version

NEW

Product information:

- for tool shank tolerance h8
- precision collet holders, sealed version ER11 sim. ISO 15488
- especially for precision collet holders art. no. 4475 and 4476
- concentricity 2 µm
- no clamping bridging
- observe maximum torque values of clamping nut clamping Ø 1.0 - 2.5 = 7 Nm clamping Ø 3.0 - 7.5 = 10 Nm





Article no. **4575**

Size	d1	d2	l1	Order no.
	mm	mm	mm	
ER11	3.00	11.3	18.00	4575 3.011
ER11	4.00	11.3	18.00	4575 4.011
ER11	5.00	11.3	18.00	4575 5.011
ER11	6.00	11.3	18.00	4575 6.011

Retaining nut for precision collet holders

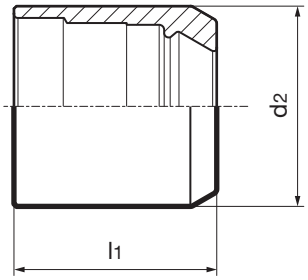
NEW

Product information:

- especially for precision collet holders art. no. 4475 and 4476
- for precision collet holders ER11 (sim. ISO 15488) art. no. 4574 and 4575

Suitable accessories separately available:

- roller bearing wrench art. no. 4994 11.000
- torque wrench art. no. 4981 5.025
- roller bearing wrench head art. no. 4995 for optimal operation





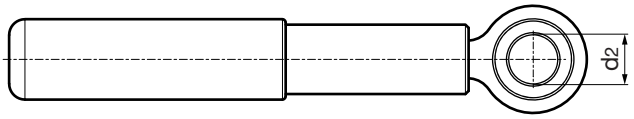
Article no. **4573**

Nominal size	d2	l1	Ø-range	**Order no.**
	mm	mm		
ER11	16.00	16.200	1.0-7.0	4573 11.000

Roller bearing wrenches for precision collet holders

Product information:

- especially for precision collet holders
  art. no. 4475 and 4476
- observe maximum torque values of clamping nut
  clamping Ø 1.0 - 2.5 = 7 Nm
  clamping Ø 3.0 - 7.5 = 10 Nm





Article no.	**4994**

Nominal size	d2	**Order no.**
	mm	
ER11	16	4994 11.000

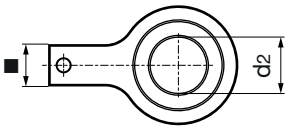
Roller bearing wrenches head for torque wrenches

Product information:

- especially for precision collet holders art. no. 4475 and 4476
- roller bearing wrench head for torque wrench
- observe maximum torque values of clamping nut clamping Ø 1.0 - 2.5 = 7 Nm clamping Ø 3.0 - 7.5 = 10 Nm

Suitable accessories separately available:

- torque wrench art. no. 4981 5.025





Article no.	4995

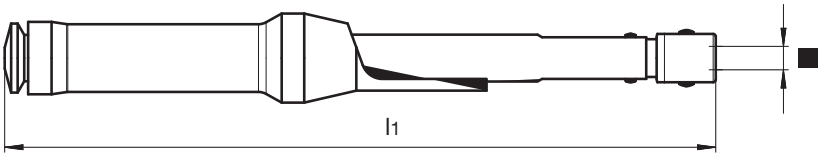
Nominal size	d2	Drive	Order no.
	mm	■	
ER11	16	9x12	4995 11.000

Torque wrenches

NEW

Product information:

- torque adjustable: 5-25 Nm
- with square socket
- release accuracy ± 4% of the scale value





Article no.	**4981**

Drive	Torque	l1	**Order no.**
■	Nm	mm	
9x12	5-25	273	4981 5.025

GÜHROJET HSK-A Weldon side lock holders

HSK-A

Product information:

- HSK-A to ISO 12164-1 / DIN 69893-1
- with locating bore DIN 1835-2 Form B “Weldon”
- dimensions to DIN 69882-4
- balancing quality: G 6.3 / 15,000 rev./min
- for tool shank tolerance h6
- from holder d1 = 25 with two clamping screws
- with coolant ducts for peripheral cooling, therefore process and tool life improvement
- coolant ducts: d1 = 6 - 14 mm with two coolant ducts, d1 = 16 - 40 mm with four coolant ducts

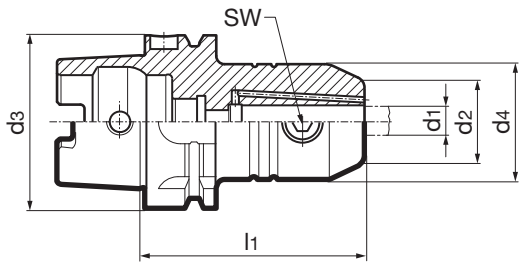
Scope of delivery:

- incl. clamping screw art. no. 4903

Suitable accessories separately available:

- coolant supply set art. no. 4949

GÜHROJET





Article no. **4232**

d3	d1 H5	d2	d4	l1	SW		Order no.
	mm	mm	mm	mm	mm	kg	
HSK-A 32	6	15	25	60	3	0.24	4232 6.032
HSK-A 32	8	20	28	60	4	0.27	4232 8.032
HSK-A 32	10	25	35	65	5	0.31	4232 10.032
HSK-A 32	12	30	42	65	6	0.41	4232 12.032
HSK-A 40	6	15	25	60	3	0.32	4232 6.040
HSK-A 40	8	20	28	60	4	0.35	4232 8.040
HSK-A 40	10	25	35	60	5	0.47	4232 10.040
HSK-A 40	12	30	42	70	6	0.58	4232 12.040
HSK-A 40	14	32	44	75	6	0.59	4232 14.040
HSK-A 40	16	36	48	75	6	0.64	4232 16.040
HSK-A 50	6	15	25	65	3	0.50	4232 6.050
HSK-A 50	8	20	28	65	4	0.60	4232 8.050
HSK-A 50	10	25	35	65	5	0.60	4232 10.050
HSK-A 50	12	30	42	80	6	0.90	4232 12.050
HSK-A 50	14	32	44	80	6	0.90	4232 14.050
HSK-A 50	16	36	48	80	6	1.00	4232 16.050
HSK-A 50	18	38	50	80	6	1.00	4232 18.050
HSK-A 50	20	40	52	80	8	1.00	4232 20.050
HSK-A 63	6	15	25	65	3	0.80	4232 6.063
HSK-A 63	8	20	28	65	4	0.80	4232 8.063
HSK-A 63	10	25	35	65	5	0.90	4232 10.063
HSK-A 63	12	30	42	80	6	1.20	4232 12.063
HSK-A 63	14	32	44	80	6	1.20	4232 14.063
HSK-A 63	16	36	48	80	6	1.30	4232 16.063
HSK-A 63	18	38	50	80	6	1.40	4232 18.063
HSK-A 63	20	40	52	80	8	1.40	4232 20.063
HSK-A 63	25	45	65	110	10	2.40	4232 25.063
HSK-A 63	32	56	72	110	10	2.70	4232 32.063
HSK-A 80	6	15	25	80	3	1.75	4232 6.080
HSK-A 80	8	20	28	80	4	1.90	4232 8.080
HSK-A 80	10	25	35	80	5	2.10	4232 10.080
HSK-A 80	12	30	42	80	6	2.10	4232 12.080
HSK-A 80	14	32	44	80	6	2.30	4232 14.080
HSK-A 80	16	36	48	100	6	2.50	4232 16.080
HSK-A 80	18	38	50	100	6	2.50	4232 18.080
HSK-A 80	20	40	52	100	8	2.70	4232 20.080

							Article no.	4232
d3	d1 H5	d2	d4	l1	SW		Order no.	
	mm	mm	mm	mm	mm	kg		
HSK-A 80	25	45	65	100	10	2.80	4232 25.080	
HSK-A 80	32	56	72	110	10	2.85	4232 32.080	
HSK-A 80	40	60	80	120	10	2.98	4232 40.080	
HSK-A 100	6	15	25	80	3	3.00	4232 6.100	
HSK-A 100	8	20	28	80	4	3.20	4232 8.100	
HSK-A 100	10	25	35	80	5	3.40	4232 10.100	
HSK-A 100	12	30	42	80	6	3.40	4232 12.100	
HSK-A 100	14	32	44	80	6	3.50	4232 14.100	
HSK-A 100	16	36	48	100	6	3.80	4232 16.100	
HSK-A 100	18	38	50	100	6	3.80	4232 18.100	
HSK-A 100	20	40	52	100	8	3.90	4232 20.100	
HSK-A 100	25	45	65	100	10	3.90	4232 25.100	
HSK-A 100	32	56	72	100	10	4.20	4232 32.100	
HSK-A 100	40	60	80	110	10	4.60	4232 40.100	

GÜHROJET ISO taper Weldon side lock holders



Product information:

- SK to DIN ISO 7388-1 form AD/AF
- with locating bore DIN 1835-2 Form B “Weldon”
- coolant supply form AD/B (* version AD without coolant supply over collar and without GÜHROJET)
- bores for form B closed when supplied with set screws
- balancing quality: G 6.3 / 15,000 rev./min
- for tool shank tolerance h6
- with coolant ducts in the clamping bore for peripheral cooling, therefore process and tool life improvement
- coolant ducts: d1 = 6 - 14 mm with two coolant ducts, d1 = 16 - 32 mm with four coolant ducts

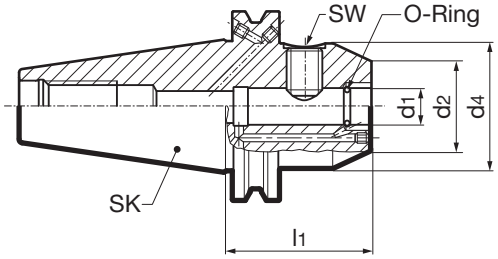
Scope of delivery:

- incl. clamping screw art. no. 4903
- incl. O-ring for sealing

Suitable accessories separately available:

- ISO pull studs art. no. 4925, 4926

GÜHROJET





Article no. **4317**

SK	d1 h5	d2	d4	l1	SW		Order no.
	mm	mm	mm	mm	mm	kg	
SK 40	6	15	25	50	3	0.89	4317 6.040
SK 40	8	20	28	50	4	0.90	4317 8.040
SK 40	10	25	35	50	5	0.96	4317 10.040
SK 40	12	30	42	50	6	1.20	4317 12.040
SK 40	14	32	44	50	6	1.20	4317 14.040
SK 40	16	36	48	63	6	1.27	4317 16.040
SK 40	18	38	50	63	6	1.29	4317 18.040
SK 40	20	40	52	63	8	1.29	4317 20.040
SK 40	25	45	63	100	10	2.30	4317 25.040
SK 40	32	56	72	100	10	2.50	4317 32.040
SK 40	6	15	25	100	3	1.20	4317 106.040
SK 40	8	20	28	100	4	1.20	4317 108.040
SK 40	10	25	35	100	5	1.30	4317 110.040
SK 40	12	30	42	100	6	1.40	4317 112.040
SK 40	14	32	44	100	6	1.50	4317 114.040
SK 40	16	36	48	100	6	1.60	4317 116.040
SK 40	18	38	50	100	6	1.60	4317 118.040
SK 40	20	40	52	100	8	1.70	4317 120.040
SK 40	16	36	45	35	6	0.70	4317 916.040
SK 40	20	40	45	35	8	1.20	4317 920.040
SK 40	25	45	50	35	10	0.80	4317 925.040
SK 50	6	15	25	63	3	2.70	4317 6.050
SK 50	8	20	28	63	4	2.70	4317 8.050
SK 50	10	25	35	63	5	2.90	4317 10.050
SK 50	12	30	42	63	6	3.00	4317 12.050
SK 50	14	32	44	63	6	3.00	4317 14.050
SK 50	16	36	48	63	6	3.10	4317 16.050
SK 50	18	38	50	63	6	3.00	4317 18.050
SK 50	20	40	52	63	8	3.10	4317 20.050
SK 50	25	45	65	80	10	3.70	4317 25.050
SK 50	32	56	72	100	10	4.50	4317 32.050

GÜHROJET MAS/BT Weldon side lock holders

MAS-BT

Product information:

- MAS/BT in accordance with DIN ISO 7388-2 form JD/JF, (BT30 in JD design without internal coolant supply via the collar and without GÜHROJET)
- with locating bore DIN 1835-2 Form B “Weldon”
- balancing quality: G 6.3 / 15,000 rev./min
- with coolant ducts in the clamping bore for peripheral cooling, therefore process and tool life improvement
- coolant ducts: d1 = 6 - 18 mm with two coolant ducts d1 = 20 - 32 mm with four coolant ducts

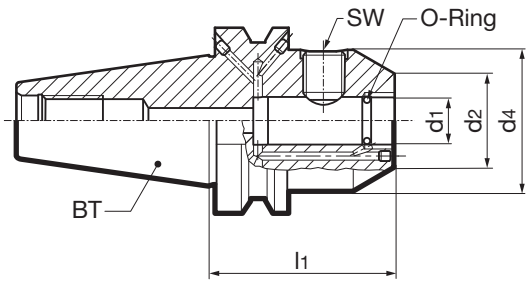
Scope of delivery:

- incl. clamping screw
- incl. O-ring for sealing

Suitable accessories separately available:

- BT pull studs art. no. 4927, 4928

GÜHROJET





Article no. **4234**

BT	d1 H5	d2	d4	l1	SW		Order no.
	mm	mm	mm	mm	mm	kg	
BT 30	6	15	25	50	3	0.46	4234 6.030
BT 30	8	20	28	50	4	0.49	4234 8.030
BT 30	10	25	35	50	5	0.54	4234 10.030
BT 30	12	30	42	50	6	0.60	4234 12.030
BT 30	14	32	44	50	6	0.61	4234 14.030
BT 30	16	36	48	63	6	0.81	4234 16.030
BT 30	18	38	50	63	6	0.82	4234 18.030
BT 30	20	40	52	63	8	0.81	4234 20.030
BT 40	6	15	25	50	3	1.00	4234 6.040
BT 40	8	20	28	50	4	1.09	4234 8.040
BT 40	10	25	35	63	5	1.20	4234 10.040
BT 40	12	30	42	63	6	1.01	4234 12.040
BT 40	14	32	44	63	6	1.30	4234 14.040
BT 40	16	36	48	63	6	1.30	4234 16.040
BT 40	18	38	50	63	6	1.30	4234 18.040
BT 40	20	40	52	63	8	1.40	4234 20.040
BT 40	25	45	63	90	10	2.10	4234 25.040
BT 40	32	56	72	100	10	2.78	4234 32.040
BT 40	6	15	25	100	3	1.20	4234 106.040
BT 40	8	20	28	100	4	1.27	4234 108.040
BT 40	10	25	35	100	5	1.41	4234 110.040
BT 40	12	30	42	100	6	1.62	4234 112.040
BT 40	14	32	44	100	6	1.68	4234 114.040
BT 40	16	36	48	100	6	1.81	4234 116.040
BT 40	18	38	50	100	6	1.87	4234 118.040
BT 40	20	40	52	100	8	1.92	4234 120.040
BT 40	16	36	45	35	6	0.97	4234 916.040
BT 40	20	40	45	35	8	0.92	4234 920.040
BT 40	25	45	45	35	10	0.84	4234 925.040

HSK-A hydraulic synchro tapping chucks with internal coolant

HSK-A

Product information:

- HSK-A to ISO 12164-1 / DIN 69893-1
- balancing quality: G 6.3 / 15,000 rev./min
- setting screw enables 3 mm axial length readjustment
- minimal length compensation ± 0.3 mm in pushing and drawing direction between synchro spindle and threading tool
- reduces high frictional forces on the thread flanks
- reduces an increase in axial forces during the cutting cycle to a minimum
- coolant pressure up to max. 80 bar

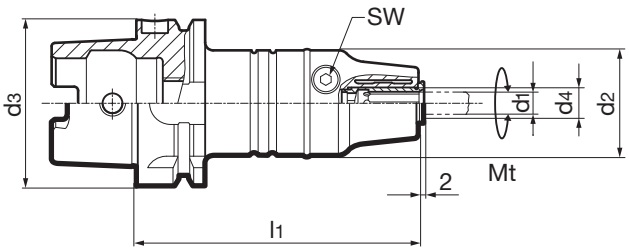
Scope of delivery:

- incl. clamping key art. no. 4912
- incl. adjustment key for adjustment screws

Suitable accessories separately available:

- setting screw “face” art. no. 4364
- replacement clamping screws art. no. 4241
- reduction bushes art. no. 4605 or 4606
- coolant supply set art. no. 4949

GÜHROSYNC





Article no. **4601**

d3	G	d1	d2	d4	l1	Mt max.	SW		Order no.
		mm	mm	mm	mm	Nm	mm	kg	
HSK-A 63	M2-M12	2.8-10.0	40.0	12	106.5	26	4.0	1.2	4601 12.063
HSK-A 63	M4,5-M20	6.0-16.0	40.0	20	120.5	90	5.0	1.3	4601 20.063
HSK-A 100	M2-M12	2.8-10.0	40.0	12	113.0	26	4.0	2.6	4601 12.100
HSK-A 100	M4,5-M20	6.0-16.0	40.0	20	127.0	90	5.0	2.7	4601 20.100

ISO taper hydraulic synchro tapping chucks with internal coolant



Product information:

- SK30 to DIN ISO 7388-1 form AD without coolant supply over collar
- SK40 to DIN ISO 7388-1 form AD/AF
- balancing quality: G 6.3 / 15,000 rev./min
- setting screw enables 3 mm axial length readjustment
- minimal length compensation ± 0.3 mm in pushing and drawing direction between synchro spindle and threading tool
- reduces high frictional forces on the thread flanks
- reduces an increase in axial forces during the cutting cycle to a minimum
- coolant pressure up to max. 80 bar

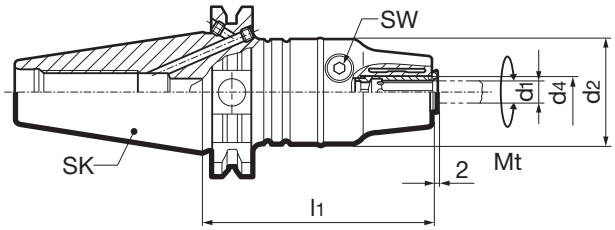
Scope of delivery:

- incl. clamping key art. no. 4912
- incl. adjustment key for adjustment screws

Suitable accessories separately available:

- setting screw “face” art. no. 4364
- replacement clamping screws art. no. 4241
- reduction bushes art. no. 4605 or 4606
- coolant supply set art. no. 4949

GÜHROSYNC





Article no. **4576**

SK	G	d1	d2	d4	l1	Mt max.	SW		Order no.
		mm	mm	mm	mm	Nm	mm	kg	
SK 30	M2-M12	2.8-10.0	40.0	12	81.0	26	4.0	0.8	4576 12.030
SK 30	M4,5-M20	6.0-16.0	40.0	20	95.0	90	5.0	0.9	4576 20.030
SK 40	M2-M12	2.8-10.0	40.0	12	85.0	26	4.0	1.3	4576 12.040
SK 40	M4,5-M20	6.0-16.0	40.0	20	99.0	90	5.0	1.5	4576 20.040

MAS/BT hydraulic synchro tapping chucks with internal coolant

MAS-BT

Product information:

- MAS/BT30 to DIN ISO 7388-2 form JD without coolant supply over collar
- MAS/BT40 to DIN ISO 7388-2 form JD/JF
- balancing quality: G 6.3 / 15,000 rev./min
- setting screw enables 3 mm axial length readjustment
- minimal length compensation ± 0.3 mm in pushing and drawing direction between synchro spindle and threading tool
- reduces high frictional forces on the thread flanks
- reduces an increase in axial forces during the cutting cycle to a minimum
- coolant pressure up to max. 80 bar

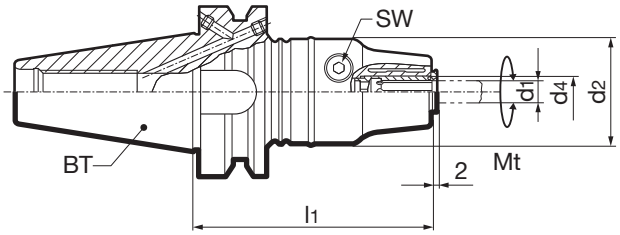
Scope of delivery:

- incl. clamping key art. no. 4912
- incl. adjustment key for adjustment screws

Suitable accessories separately available:

- setting screw “face” art. no. 4364
- replacement clamping screws art. no. 4241
- reduction bushes art. no. 4605 or 4606
- coolant supply set art. no. 4949

GÜHROSYNC





Article no. **4577**

BT	G	d1	d2	d4	l1	Mt max.	SW		Order no.
		mm	mm	mm	mm	Nm	mm	kg	
BT 30	M2-M12	2.8-10.0	40.0	12	81.0	26	4.0	0.9	4577 12.030
BT 30	M4,5-M20	6.0-16.0	40.0	20	95.0	90	5.0	0.9	4577 20.030
BT 40	M2-M12	2.8-10.0	40.0	12	85.0	26	4.0	1.3	4577 12.040
BT 40	M4,5-M20	6.0-16.0	40.0	20	99.0	90	5.0	1.4	4577 20.040

Straight shank hydraulic synchro tapping chucks for internal coolant

Product information:

- holder shank similar DIN 1835 or holding in precision chucks (hydraulic, shrink fit or power clamping chucks)
- setting screw enables 3 mm axial length readjustment
- minimal length compensation ± 0.3 mm in pushing and drawing direction between synchro spindle and threading tool
- reduces high frictional forces on the thread flanks
- reduces an increase in axial forces during the cutting cycle to a minimum
- coolant pressure up to max. 80 bar

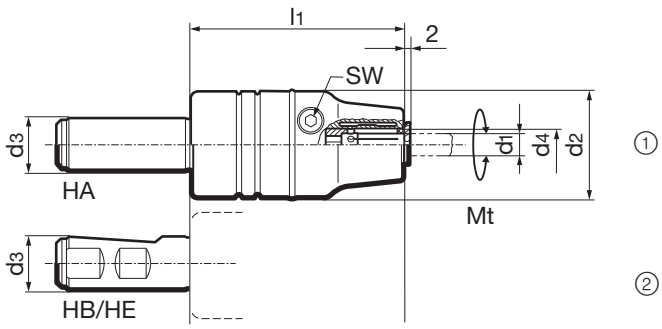
Scope of delivery:

- incl. clamping key art. no. 4912
- incl. adjustment key for adjustment screws

Suitable accessories separately available:

- setting screw “face” art. no. 4364
- replacement clamping screws art. no. 4241
- reduction bushes art. no. 4605 or 4606

GÜHROSYNC





Article no. **4525**

d3 h6	Shank	G	d1	d2	d4	l1	Mt max.	SW		Order no.
mm				mm	mm	mm	Nm	mm	kg	
20	HA	M2-M12	2.8-10.0	40	12	80	26	4	0.7	4525 12.020
20	HA	M4,5-M20	6.0-16.0	40	20	94	90	5	5.8	4525 20.020
25	HB	M2-M12	2.8-10.0	40	12	80	26	4	0.7	4525 12.025
25	HB	M4,5-M20	6.0-16.0	40	20	94	90	5	1.0	4525 20.025

GÜHROJET reduction bushes for hydraulic synchro tapping chucks

Cyl

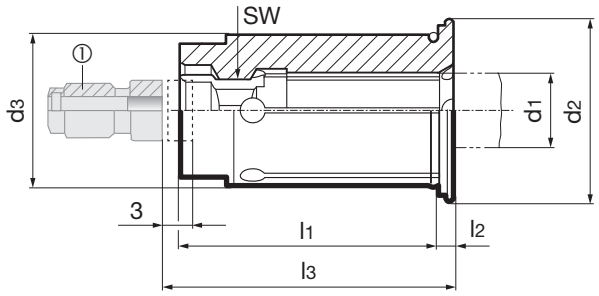
Product information:

- for clamping taps with square shank in GUHROSync synchro tapping chucks
- clamping-Ø for tool shank tolerance h6-h9
- positive drive of reduction bush in Guhrosync synchro chuck
- position setting screw on the shank of the tap
- setting screw enables 3 mm axial length readjustment
- with coolant slots for peripheral cooling, therefore process and tool life improvement
- coiled swarf is consistently washed away

Scope of delivery:

- setting screw “face” art. no. 4364
- MQL setting screws art. no. 4305

GÜHROJET





Article no. **4606**

d3	d1	SW		d2	l1	l2	l3	①	G	Order no.
mm	mm	mm		mm	mm	mm	mm			
12	2.800	2.100	DIN	16.5	29	2			M2/M2,2/M2,5/M4	4606 2.812
12	3.500	2.700	DIN	16.5	29	2			M3/M4/M5	4606 3.512
12	3.581	2.794	ANSI	16.5	29	2			6-32 / 6-40	4606 3.612
12	4.000	3.200	JIS	16.5	29	2			M3/M3,5	4606 4.012
12	4.267	3.327	ANSI	16.5	29	2			8-32 / 8-36	4606 4.312
12	4.500	3.400	DIN	16.5	29	2	26	4364 5.020	M4/M6	4606 4.512
12	4.928	3.861	ANSI	16.5	29	2	26	4364 5.020	10-24 / 10-32	4606 4.912
12	5.000	4.000	JIS	16.5	29	2	26	4364 5.020	M4/M4,5/M5	4606 5.012
12	5.500	4.500	JIS	16.5	29	2	26	4364 5.020	M5	4606 5.512
12	5.588	4.191	ANSI	16.5	29	2	26	4364 5.020	12-24 / 12-28	4606 15.512
12	6.000	4.500	JIS	16.5	29	2	26	4364 6.020	M6	4606 16.012
12	6.000	4.900	DIN	16.5	29	2	26	4364 6.020	M4,5/M5/M6/M7/M8	4606 6.012
12	6.200	5.000	JIS	16.5	29	2	26	4364 6.020	M7/M8	4606 6.212
12	6.477	4.851	ANSI	16.5	29	2	26	4364 6.020	1/4-20 / 1/4-28	4606 6.412
12	7.000	5.500	DIN/JIS	16.5	29	2	26	4364 7.020	M7/M9/M10	4606 7.012
12	7.938	5.944	ANSI	16.5	29	2	31	4364 8.020	1/16-27 / 1/8-27	4606 7.912
12	8.000	6.500	JIS	16.5	29	2	31	4364 8.020	M11	4606 18.012
12	8.000	6.200	DIN	16.5	29	2	31	4364 8.020	M8/M11	4606 8.012
12	8.077	6.045	ANSI	16.5	29	2	31	4364 8.020	5/16-18 / 5/16-24	4606 28.012
12	8.204	6.147	ANSI	16.5	29	2	31	4364 8.020	7/16-14 / 7/16-20	4606 8.212
12	8.500	6.500	JIS	16.5	29	2	31	4364 8.020	M12	4606 8.512
12	9.000	7.000	DIN	16.5	29	2	32	4364 9.020	M9/M12	4606 9.012
12	9.322	6.985	ANSI	16.5	29	2	32	4364 9.020	1/2-13 / 1/2-20	4606 9.312
12	9.677	7.264	ANSI	16.5	29	2	33	4364 9.020	3/8-16 / 3/8-24	4606 9.612
12	10.000	8.000	DIN	16.5	29	2	36	4364 10.020	M10	4606 10.012
20	6.000	4.500	JIS	24.1	34	2	26	4364 6.032	M6	4606 26.020
20	6.000	4.900	DIN	24.1	34	2	26	4364 6.032	M4,5/M5/M6/M7/M8	4606 6.020
20	6.200	5.000	JIS	24.1	34	2	26	4364 6.032	M7/M8	4606 6.220
20	6.477	4.851	ANSI	24.1	34	2	26	4364 6.032	1/4-20 / 1/4-28	4606 6.420
20	7.000	5.500	DIN/JIS	24.1	34	2	26	4364 7.032	M7/M9/M10	4606 7.020
20	7.938	5.944	ANSI	24.1	34	2	31	4364 8.032	1/16-27 / 1/8-27	4606 7.920
20	8.000	6.500	JIS	24.1	34	2	31	4364 8.032	M11	4606 18.020
20	8.000	6.200	DIN	24.1	34	2	31	4364 8.032	M8/M11	4606 8.020
20	8.077	6.045	ANSI	24.1	34	2	31	4364 8.032	5/16-18 / 5/16-24	4606 28.020
20	8.204	6.147	ANSI	24.1	34	2	31	4364 8.032	7/16-14 / 7/16-20	4606 8.220
20	8.500	6.500	JIS	24.1	34	2	31	4364 8.032	M12	4606 8.520

Article no. **4606**

d3	d1	SW		d2	l1	l2	l3	①	G	Order no.
mm	mm	mm		mm	mm	mm	mm			
20	9.000	7.000	DIN	24.1	34	2	32	4364 9.032	M9/M12	4606 9.020
20	9.322	6.985	ANSI	24.1	34	2	32	4364 9.032	1/2-13 / 1/2-20	4606 9.320
20	9.677	7.264	ANSI	24.1	34	2	33	4364 9.032	3/8-16 / 3/8-24	4606 9.620
20	10.000	8.000	DIN	24.1	34	2	36	4364 10.032	M10	4606 10.020
20	10.500	8.000	JIS	24.1	34	2	36	4364 10.032	M14	4606 10.520
20	10.897	8.179	ANSI	24.1	34	2	35	4364 10.032	9/16-12 / 9/16-18	4606 10.820
20	11.000	9.000	DIN	24.1	34	2	37	4364 11.032	M14	4606 11.020
20	12.000	9.000	DIN	24.1	34	2	37	4364 11.032	M16	4606 12.020
20	12.192	9.144	ANSI	24.1	34	2	36	4364 11.032	5/8-11 / 5/8-18	4606 12.120
20	12.500	10.000	JIS	24.1	34	2	38	4364 11.032	M16	4606 12.520
20	13.000	10.000	JIS	24.1	34	2	38	4364 11.032	M17	4606 13.020
20	14.000	11.000	DIN/JIS	24.1	34	2	39	4364 14.032	M18	4606 14.020
20	14.288	10.693	ANSI	24.1	34	2	38	4364 14.032	1/4-18	4606 14.220
20	14.986	11.227	ANSI	24.1	34	2	39	4364 14.032	3/4-10 / 3/4-16	4606 14.920
20	15.000	12.000	JIS	24.1	34	2	40	4364 16.032	M20	4606 15.020
20	16.000	12.000	DIN	24.1	34	2	41	4364 16.032	M20	4606 16.020

Adjustment screws “faces” for synchro tapping chucks with int. coolant

AB

Product information:

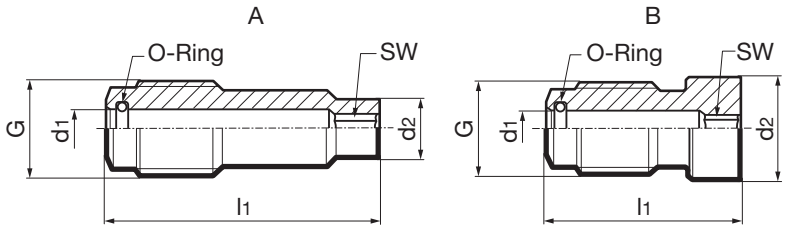
- for hydro-synchro tapping chucks art. no. 4601, 4576, 4577 and 4525
- for synchro tapping chucks art. no. 4326 and 4327
- for conventional internal cooling
- with plane stop for standard shank ends
- position setting screw on the shank of the tap
- setting screw enables 3 mm axial length readjustment

Scope of delivery:

- with O-ring for secure seal

Suitable accessories separately available:

- hexagon clamping key art. no. 4912 type “B”





Article no. **4364**

Size	G	d1	d2	l1	SW	Type	Order no.
		mm	mm	mm	mm		
ER20	M8 x 1	3.6	3.3	23.7	2.0	A	4364 5.020
ER20	M8 x 1	3.6	4.8	23.7	2.5	A	4364 6.020
ER20	M8 x 1	3.6	5.4	23.7	2.5	A	4364 7.020
ER20	M8 x 1	3.6	5.8	18.7	2.5	A	4364 8.020
ER20	M8 x 1	3.6	6.9	17.7	2.5	A	4364 9.020
ER20	M8 x 1	3.6	7.8	13.7	2.5	B	4364 10.020
ER20	M8 x 1	3.6	8.8	14.8	2.5	B	4364 11.020
ER32	M10X1	4.1	3.3	33.0	2.0	A	4364 5.032
ER32	M10X1	4.1	4.8	34.0	3.0	A	4364 6.032
ER32	M10X1	4.1	5.4	33.8	3.0	A	4364 7.032
ER32	M10X1	4.1	6.1	28.8	3.0	A	4364 8.032
ER32	M10X1	4.1	6.9	28.2	3.0	A	4364 9.032
ER32	M10X1	4.1	7.8	23.8	3.0	A	4364 10.032
ER32	M10X1	4.1	8.8	22.9	3.0	A	4364 11.032
ER32	M10X1	4.1	10.8	20.6	3.0	B	4364 14.032
ER32	M10X1	4.1	11.8	19.6	3.0	B	4364 16.032
ER32	M10X1	4.1	14.3	18.0	3.0	B	4364 18.032



TECHNICAL SECTION

6

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Efficient milling with the correct strategies

GTC milling strategies

These milling strategies belong to the state-of-the-art and most effective application methods for current solid carbide milling tools. When applied, an enormously high metal removal rate ensures a considerable increase in productivity. Very high cutting parameters can be achieved even with less powerful machines or unstable machining conditions. With difficult-to-machine materials or unfavourable diameter-length-ratios of the tools a massive increase of process reliability can be achieved.

GTC
GÜHRING TROCHOIDAL CUTTING

HPC

HIGH PERFORMANCE CUTTING

max. metal removal rate/time → stable conditions; short de-clamping; high performance; good cooling

HSC

HIGH SPEED CUTTING

at high speed/high feed rate → high dynamics; low cutting depth; low drive power

Principles and objectives

Maximum tool utilisation
- utilisation of entire cutting edge length
- full power delivery
- increased tool life
- balanced wear

Modification of cutting distribution
- low cutting widths a_e
- high cutting depths a_p

High process reliability
- low tool wrapping
- improved thermal conditions at tool cutting edge
- low mechanical stress

Maximum metal removal rate
- saving time/machine costs



Foundations for economically efficient milling

Peripheral requirements

Applicable in every material group

- P K H M S N
- easy to machine materials = increase in productivity
- difficult to machine materials = increase in process reliability

High-dynamic machining centres

- short acceleration distances
- higher speed range
- small to medium tool diameters

Heavy machines

- stable feed axes
- high spindle torque
- medium to large tool diameters

Unstable to stable workpiece clamping

- stable = vibration-free machining = maximum metal removal rate
- unstable = reduction of radial forces = increased process reliability

Application parameters

Low cutting width a_e to 0.33xD

- low angle of engagement <70°
- short time of contact between cutting edge and component

Very high tooth feed f_z

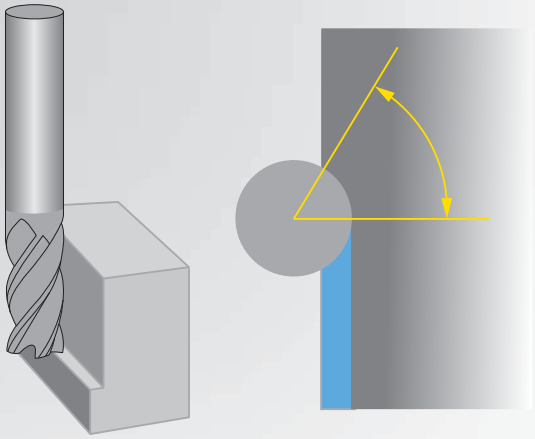
- reduced chip thickness allows considerably higher f_z

Very high cutting speed v_c

- reduced heating up and prolonged cooling down allow very high v_c values

High cutting depth a_p

- improved leverage effect
- high metal removal rate
- increase in contact points between tool and component



Tool angle of engagement & tool contact time

Metal removal rate

The metal removal rate specifies how high the actual chip removal is per minute.
It is especially suitable for comparing different machining strategies.

$$a_p \text{ (mm)} \times a_e \text{ (mm)} \times v_f \text{ (m/min)} = Q \text{ (cm}^3\text{/min)}$$

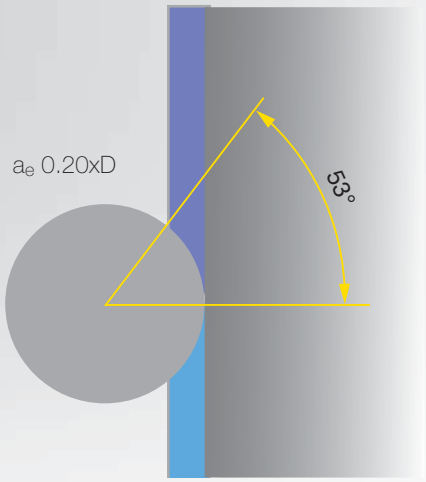
Influence on process through tool engagement

Angle of engagement

The angle of engagement inscribes the cutting range of the tool from start of chip formation to exit from the material. With these parameters the stress impacting on the tool can be assessed. With straight milling paths the angle is constant, with concave milling paths it increases and with convex milling paths it decreases.

Straight milling path
- constant angle of engagement
- constant tool stress

Example: a_e 0.20xD = 53° engagement
Engagement remains a constant 53°

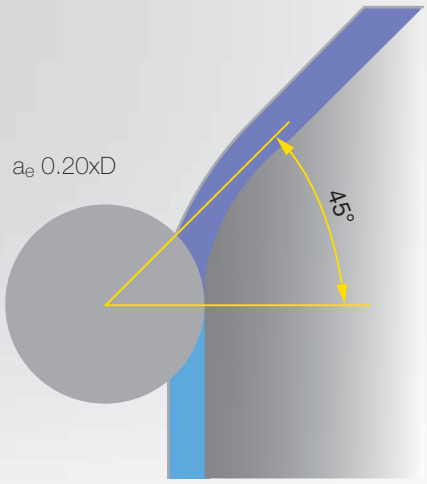


Angle of engagement with convex contour radii

Convex milling path
- decreasing angle of engagement
- reduced tool stress

Example: a_e 0.20xD = 53° engagement
Engagement reduces to 45°

Measures: a_e may be increased
f_z can be increased

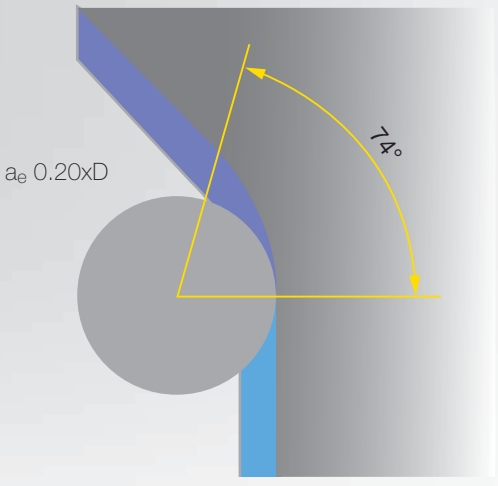


Angle of engagement with concave contour radii

Concave milling path
- increasing angle of engagement
- increased tool stress

Example: a_e 0.20xD = 53° engagement
Engagement increases to 74°

Measures: a_e must be reduced
f_z must be reduced in radius



Influence on process through tool engagement

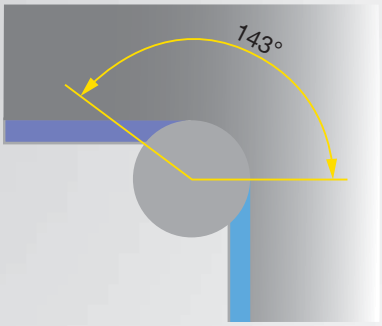
Angle of engagement with 90° corner radii

Tool radius = Corner radius
- very unfavourable for tool dynamics
- change of stress direction
- abrupt increase in tool stress

Example: Increase of engagement angle from 53° to 143° (270 %)

Measures: v_c and f_z must be heavily reduced

a_e 0.20xD

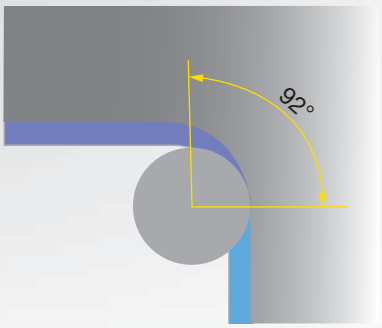


Tool radius < Corner radius
- machine can interpolate the path
- no “impact” on tool
- lower increase of tool stress

Example: Increase of engagement angle from 53° to 92° (174 %)

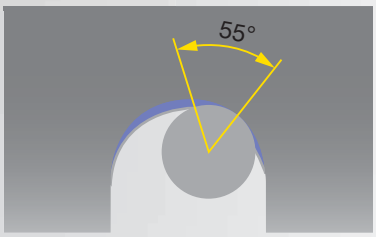
Measures: a_e must be reduced
f_z must be heavily reduced in radius

a_e 0.20xD

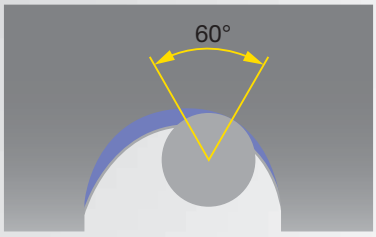


Ratio of flute width to tool diameter with trochoidal milling

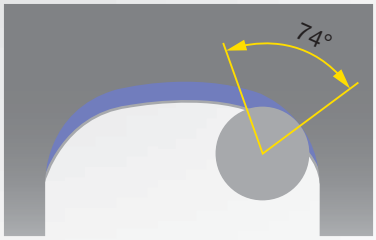
Flute width 1.7-2.0xD
- cut in C-arc
- a_e max. 0.10xD (theor. 37°)
- increase of angles of engagement by up to 50 %



Flute width 2.1-3.0xD
- cut in C-arc
- a_e max. 0.15xD (theor. 46°)
- increase of angles of engagement by up to 30 %



Flute width 3.1xD
- cut in D-arc
- a_e max. 0.20xD (theor. 53°)
- increase of angles of engagement by up to 40 %



Guide values for increasing the cutting values with cutting edge lengths up to 3xD					
GTC HPC HSC Roughing and HSC finishing					
Material	**Application**	**radial feed in % of Ø**	**v_c factor ***	**f_z factor ***	**Angle of engagement**
	Slotting	**100 %**	**1**	**1**	**180°**
N P K M S	HPC Roughing	33 %	1.5	1.3	70°
	HPC Roughing	25 %	1.6	1.5	60°
	HPC Roughing	20 %	1.7	1.6	53°
	HPC Roughing	15 %	1.8	1.9	46°
	HSC Roughing	10 %	1.9	2.3	37°
	HSC Roughing	8 %	2.0	2.5	31°
	HSC Roughing	5 %	2.1	2.5	26°
N P K M S	HSC Finishing	3 %	2.0	1.2	20°
	HSC Finishing	2 %	2.0	1.1	18°
	HSC Finishing	1 %	2.0	1.0	11°
	HSC Fine finishing	0.5 %	2.2	0.9	8°

* base value for the calculation with v_c and f_z factors is the value specified in the Gühring Navigator for "slotting" in the respective material group.

Base cutting values slotting – RF 100 tools – smooth cutting

Material	Hardness	Application	v_c	f_z (mm/tooth) with nom. Ø									
				3	4	5	6	8	10	12	16	20	25
P1	≤ 850 N/mm²	Slotting	180	0.015	0.020	0.025	0.030	0.040	0.060	0.072	0.096	0.120	0.150
P2	850-1200 N/mm²	Slotting	160	0.014	0.019	0.024	0.029	0.038	0.055	0.066	0.088	0.110	0.138
P3	850-1400 N/mm²	Slotting	135	0.014	0.018	0.023	0.027	0.036	0.050	0.060	0.080	0.100	0.125
M1	< 750 N/mm²	Slotting	120	0.014	0.018	0.023	0.027	0.036	0.050	0.060	0.080	0.100	0.125
M2	750-850 N/mm²	Slotting	80	0.012	0.016	0.020	0.024	0.032	0.045	0.054	0.072	0.090	0.113
M3	> 850 N/mm²	Slotting	70	0.011	0.014	0.018	0.021	0.028	0.040	0.048	0.064	0.080	0.100
S-Ni	≤ 1300 N/mm²	Slotting	30	0.008	0.011	0.014	0.017	0.022	0.032	0.038	0.051	0.064	0.080
S-Ti	≤ 1300 N/mm²	Slotting	60	0.012	0.016	0.020	0.024	0.032	0.045	0.054	0.072	0.090	0.113
K1	≤ 240 HB	Slotting	160	0.017	0.022	0.028	0.033	0.044	0.065	0.078	0.104	0.130	0.163
K2	> 240 HB	Slotting	140	0.015	0.020	0.025	0.030	0.040	0.055	0.066	0.088	0.110	0.138
Wr. al.alloy	≤ 5 % Si	Slotting	500	0.020	0.026	0.033	0.039	0.052	0.075	0.090	0.120	0.150	0.188
Cast al. alloy	> 5 % Si	Slotting	230	0.017	0.022	0.028	0.033	0.044	0.060	0.072	0.096	0.120	0.150
Non-fer.metals	≤ 850 N/mm²	Slotting	250	0.017	0.022	0.028	0.033	0.044	0.060	0.072	0.096	0.120	0.150

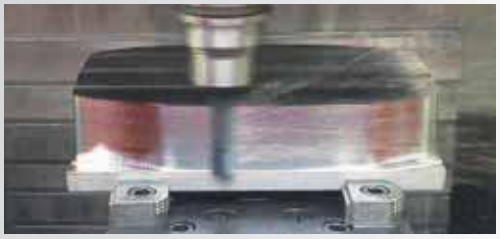
Metal removal rate a_p (mm) x a_e (mm) x v_f (m/min) = Q (cm³/min)

Example:	HPC Roughing: 15% a_e ; 2xD a_p ; C45
Tool:	RF 100 U Ø12 mm - 4 flutes
Feed:	radial feed a_e 1.8 mm = 15% of D
Base value slotting	v_c slotting = 180 m/min, f_z slotting = 0.072 mm
Conversion:	v_c factor = 1.8 → v_c: 180 m/min x 1.8 = v_c 324 m/min f_z factor = 1.9 → f_z: 0.072 mm x 1.9 = f_z 0.137
Increased values:	v_c: 324 m/min / f_z: 0.137 mm n: 8594 U/min / v_f: 4710 mm/min
Metal removal rate:	Q = 203 cm³/min

GTC milling – fully optimised application examples

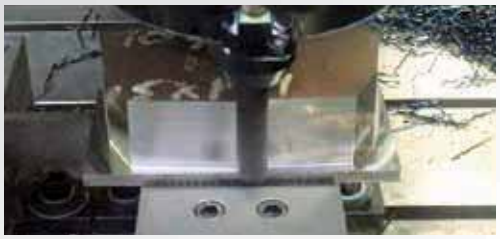
Application example – material 16MnCr5

RF 100 Speed, #6761, Ø16 mm,
HPC clamping chuck + PINLock-safety
v_c 410 m/min f_z 0.450 mm h_m 0.123 mm
a_e 1.2 mm a_p 45 mm v_f 14690 mm/min
Q = 793 cm³/min



Application example – material Hardox 400®

RF 100 U, #3871, Ø20 mm,
Weldon clamping chuck
v_c 200 m/min f_z 0.180 mm h_m 0.049 mm
a_e 1.5 mm a_p 55 mm v_f 2290 mm/min
Q = 189 cm³/min



GTC milling – Strategy comparison

Application comparison – material 42CrMo4

Gühring
RF 100 Diver, #6736, Ø12-Z4,
Weldon clamping chuck
v_c 300 m/min f_z 0.120 mm
n 7960 U/min v_f 3820 mm/min
a_e 1.5 mm a_p 24 mm
Q = 138 cm³/min

5 radial cuts per 1200 mm path
Machining time = **1.34 min**



Application comparison – material 42CrMo4

Competition
HPC milling cutter, Ø16-Z4
Weldon clamping chuck
v_c 140 m/min f_z 0.070 mm
n 2790 U/min v_f 780 mm/min
a_e 7.5 mm a_p 12 mm
Q = 70 cm³/min

2 axial cuts per 1200 mm path
Machining time = 3.05 min



Application comparison – material 1.4301

Gühring
RF 100 SF, #3632, Ø16-Z6,
Weldon clamping chuck
v_c 160 m/min f_z 0.100 mm
n 3185 U/min v_f 1910 mm/min
a_e 1.2 mm a_p 30 mm
Q = 69 cm³/min

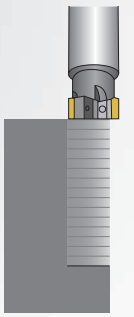
10 radial cuts per 900 mm path
Machining time = **4.43 min**



Application comparison – material 1.4301

Competition
Indexable inserted milling cutter Ø25-Z3
v_c 200 m/min f_z 0.120 mm
n 2550 U/min v_f 920 mm/min
a_e 12 mm a_p 2 mm
Q = 22 cm³/min

15 axial cuts per 900 mm path
Machining time = 14.40 min



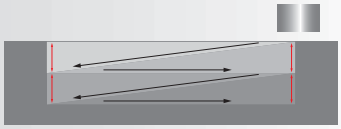
Plunging strategies and guide values

General plunging with standard face geometries

Base $f_z = f_z$ slotting

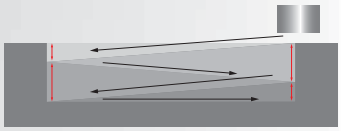
Ramping
- ramping angle = 2° - 5° to max. a_p 1 x D
- even load increase

f_z 75%



Oscillating
- ramping angle = 1° - 4° to max. a_p 1 x D
- results in load peaks

f_z 75%



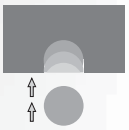
Helix
- feed = 0.05 – 0.1 x D per revolution
- smallest diameter to be produced = 1.7 x D

f_z 100%



Grooving
- alternative when problems through excess. radial forces
- a_e 0.25 x D – a_p cutting edge length / clearance ground length

f_z 100%



Drilling / pilot drilling
- max. depth feed 0.5 x D then pecking

f_z 50%

Special plunging – tools with special plunging geometry



RF 100 Diver - #6736 / #6737
- h10 cutting edge tolerance
- 36°/37°/38° helix
- reduced and nominal diameter
- good drilling characteristics
- very good milling characteristics

First choice: Milling and plunging



Pilot milling cutter RF 100 P - #6716
- m8 cutting edge tolerance
- 30° helix
- a multitude of individual dimensions
- very good drilling characteristics
- sufficient milling characteristics

First choice: Drilling and pilot drilling

Ramping
- ramping angle = 15° - 45° to max. a_p 1 x D

Oscillating
- ramping angle = 10°-20° bis max. a_p 1 x D

Helix
- feed = 0.10 -0.30 x D pro Umdrehung
- smallest diameter to be produced = 1.7 x D

Grooving
- altern. when problems through excessive radial forces
- a_e 0.25 x D - a_p cutting edge length/ clearance grind

Drilling / pilot drilling
- max. depth feed 1.0 x D then pecking

Cutting values “special plunging”
to cutting value tables RF 100 Diver & RF 100 P

General recommendation for tool cooling

Steel **Cast iron** **Hardened**	P K H	Dry machining, compressed air, MQL:	• Avoid thermal shock • Dissipate machining temperature via chip • Supporting chip evacuation
Stainless **Special alloy**	M S	Soluble oil, neat oil:	• Cooling of tool cutting edge • Preventing built-up edge • Supporting chip evacuation
Non-ferrous metals	N	Soluble oil, neat oil:	• Preventing built-up edge • Supporting chip evacuation

Exceptions for material ranges

P K

When **coolant** is not available the cutting speed (vc) and/or the radial feed (ae) should be reduced.
The resulting reduced temperature reduces the risk of thermal shock.

If there are **chip evacuation problems** the application of coolant should be taken into consideration, poor evacuation of chips can lead to massive tool wear and even tool breakage.

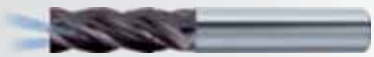
When **heat is being generated due to poor chip evacuation**, it should be checked if through coolant is available. By using a specifically directed "coolant jet", coolant can be supplied where congested without hitting the cutting area. Alternatively, the application of coolant for the entire machining operation is recommended.

Other notes

Finishing
The application of coolant is principally an advantage as a better surface finish can be achieved.

Very long tools
Coolant can result in a smoother process, as the lubricant has a vibration-reducing effect.

Alignment of coolant
- as acurate as possible in the cutting area from at least three directions
- no flushing back of small chips to the cutting area



Solid carbide milling cutters with internal cooling
- optimal chip evacuation, very good cutting edge cooling, very effective against built-up edges
- to be recommended especially for larger tool diameters and tough materials

Peripheral cooling / Guhrojet
Best external option: Optimal tool cooling and chip evacuation thanks to the direct route from coolant exit to cutting area

GÜHROJET



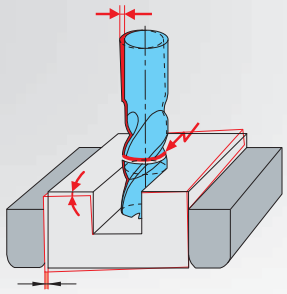
General notes

All the cutting rate recommendations specified in this catalogue are standard values valid exclusively for new tools or tools re-ground to Gühring specifications. Pre-requisites are stable machines, optimal cooling, optimal tool clamping and maximum concentricity of the tool and the machine spindle. Our recommended cutting rates must be reduced if the conditions deviate. The values may also be adjusted to influence surface quality, machining rate or tool life.

1. Workpiece clamping
Loss of tool life or tool breakage through unstable clamping

- improve workpiece clamping

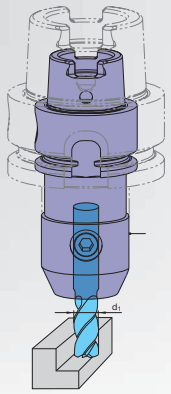
Alternative:
- reduce feed
- reduce cutting width or depth
- modify milling strategy



2. Tool clamping
Loss of tool life or tool breakage through unstable, worn or too small/long/thin tool holder

- apply new or larger tool holder or holder with increased clamping force and increased concentricity

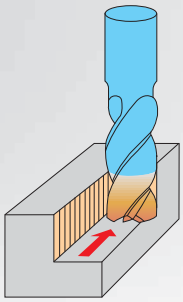
Alternative:
- reduce cutting rates
- reduce clamping length
- apply tool with smaller diameter
- check clamping screws for wear



3. Surface quality
Excessive peak-to-valley height Ra/Rz at the tool surface through excessive feed and feed rates or vibrations

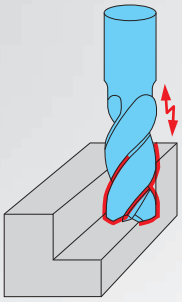
- improve workpiece clamping and tool clamping (see points 1 and 2)

Alternative:
- reduce feed and feed rate
- increase cutting speed
- use/improve cooling



4. Vibrations
High tool wear, insufficient workpiece surface quality and insufficient dimensional accuracy through vibration

- improve workpiece and tool clamping (see points 1 and 2)
- increase tooth feed, because the chip centre thickness is too small
- modify speed
- modify milling strategy, i.e. select alternative cutting distribution
- change tool selection, i.e. reduce no. of teeth or spiral

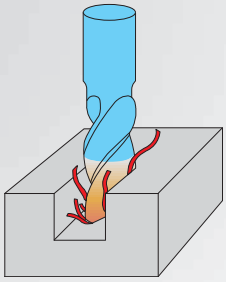


5. Chip congestion/cooling

Significant reduction in tool life, crumbling on cutting lips, edge build-up or conglutination of flutes through insufficient chip evacuation

- select milling cutters with internal cooling

Alternative:
- peripheral cooling via GM 300 chuck
- increase volume flow
- adjust coolant flow
- apply compressed air cooling (according to tool and material)
- reduce feed rate
- modify cutting distribution

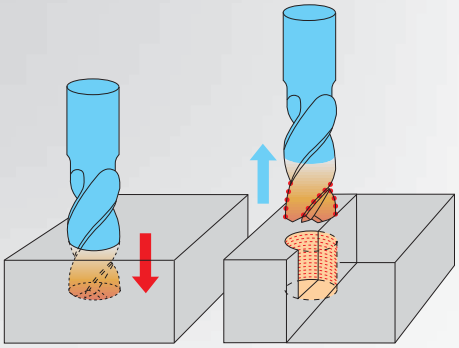


6. Pecking when drilling

Significant reduction in tool life as well as crumbling of cutting lips through insufficient chip evacuation and thermal stresses

- select milling cutter with internal cooling
- with drilling depths > 0.5 x D pecking in stages

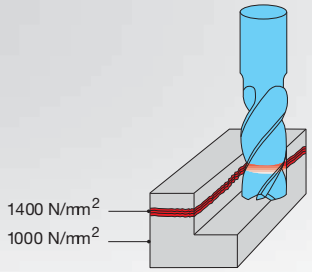
Alternative:
- peripheral cooling via GM 300 chuck
- increase volume flow
- adjust coolant flow
- reduce feed rate



7. Thermal influence on materials

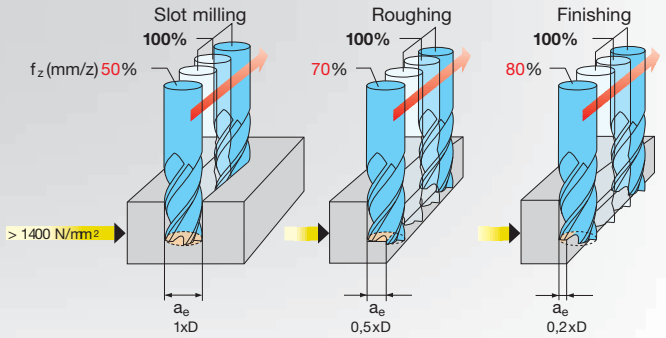
Through welding or torch cutting, the material characteristics at the parting line do not correspond with the specified material class

- reduce cutting rates
- select tool for materials with a higher tensile strength
- climb milling with solide carbide milling cutters



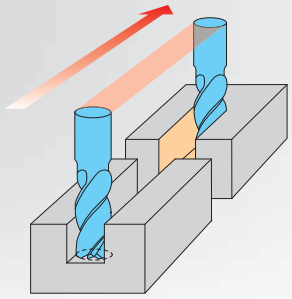
8. Entry in hardened materials

For entering materials over 1400 N/mm² (44HRC), reduce the feed rate v_f (mm/min) in accordance with the illustration on the right



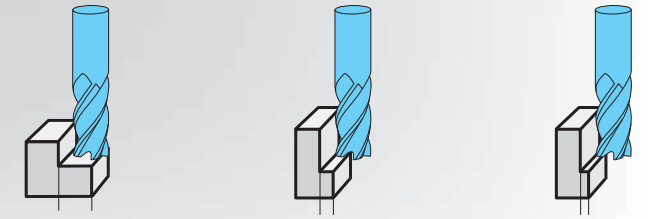
9. Loss in tool life with interrupted cutting
Significant loss in tool life through interrupted cutting (especially with milling angles of 90°)

- modify cutting distribution
- reduce feed rate for entry and exit
- reduce approach angle



10. Feed rate adjustment: Modifying the cutting width

- when modifying the cutting width a_e, the feed rate must be reduced in accordance with the illustration on the right
- select cutting speed in accordance with cutting value tables
- for slotting and roughing with a feed of $a_p > 1.5xD$, v_c and f_z should be reduced by 25%



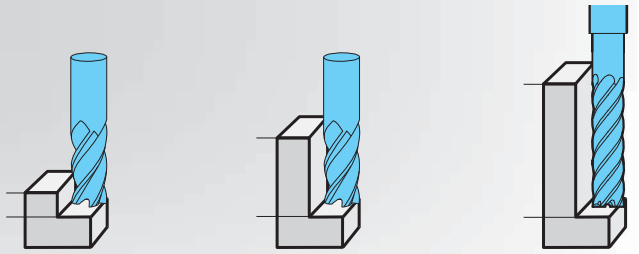
$a_e = 1 \times D$
$f_z = 100\ \%$

$a_e = 0{,}66 \times D$
$f_z = 115\ \%$

$a_e = 0{,}25 \times D$
$f_z = 150\ \%$

11. Feed rate adjustment: Modifying the cutting depth

- when modifying the cutting depth a_p, the feed rate must be reduced in accordance with the illustration on the right
- cutting speed or revolutions remain unchanged up to cutting depths of 2xD, must only be adapted over 2xD
- for longer tools revolutions and feed must be reduced in accordance with vibration



$a_p = 1 \times D$
$f_z = 100\ \%$

$a_p = 2 \times D$
$f_z = 50\ \%$

$a_p = 3 \times D$
$f_z = 25\ \%$

12. Plunging strategies:
for drilling

- reduce feed rate v_f (mm/min.)
- additional pecking for drilling depths > 0.5 x D or transition to radial machining

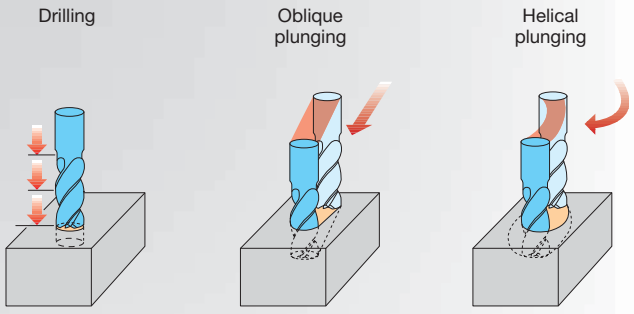
Attention: Danger of breakage through abrupt load increase!

Oblique plunging up to 5°:

- reduce feed rate v_f (mm/min.) in accordance with the illustration on the right

Helical plunging:

- for helical plunging on a milling cycle, we recommend a feed of 0.1 to 0.2 per cycle
- reduce feed rate v_f (mm/min.) in accordance with the illustration on the right
- select preferred hole diameter 1.7 x D



90°
$f_z = 50\ \%$

5°
$f_z = 75\ \%$

$f_z = 100\ \%$

13. HSC milling with ball nosed copy milling cutters

HSC = High Speed Cutting:

Milling operations with very low metal removal but with consideration of the effective tool diameter.

3D machining with ball or Torus milling.

- **low cutting width (a_e)**
- **low cutting depth (a_p)**
- **high feed rate per tooth (f_z)**
- **very high cutting speed (v_c)**

Function and Advantages

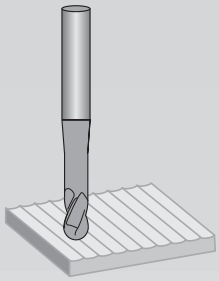
Calculation of the effective tool diameter

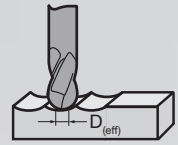
- adjusting speed to effective tool diameter
- Increasing the overall feed rate
- Improving the surface quality

Consideration of the pressure angle / width

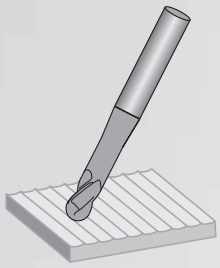
- adjusting the tooth feed to achieve the required surface quality

At cutting depths a_p <0.2xD the actual engaged effective diameter $D_{(eff)}$ must be used to calculate the speed. It is derived from the graphic below with the spindle not engaged. To increase the tool life, we recommend machining with a tilted spindle.



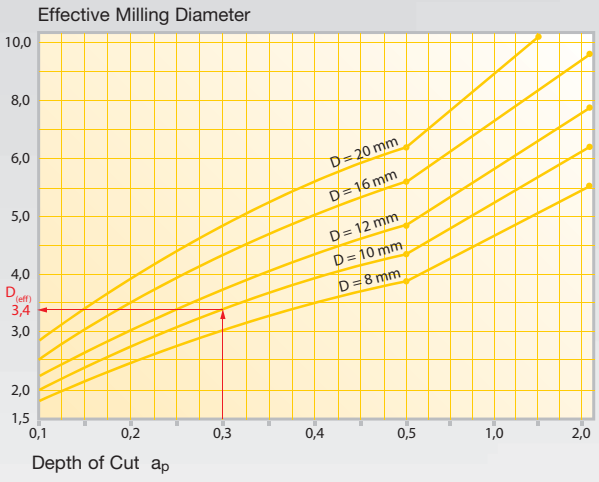


$$D_{(eff)} = 2 \cdot \sqrt{D \cdot a_p - a_p^2}$$



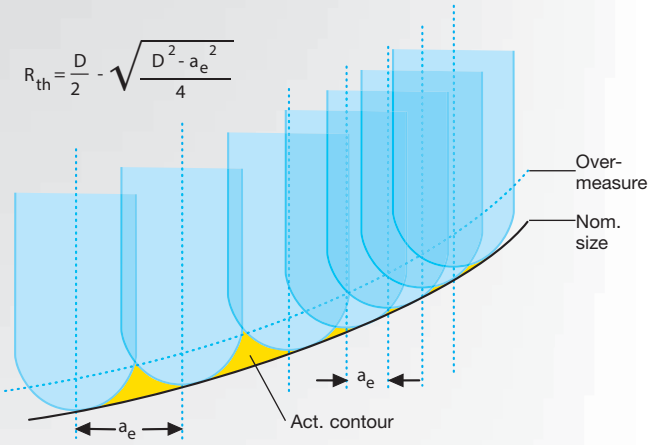
The ball-nosed milling cutter is perpendicular to the machining surface. In the centre of the tool is the cutting speed = 0 .
Tool life and surface quality are not optimal.

The ball-nosed milling cutter is oblique to the machining surface. The centre of the tool is not engaged.
Tool life and surface quality are improved.



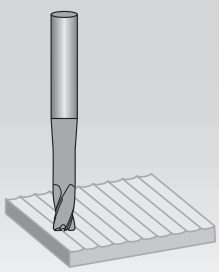
Example: For a full copy milling radius Ø 10 mm and a depth of cut a_p of 0.3 mm results in an effective diameter $D_{(eff)}$ = 3.4 mm
This $D_{(eff)}$ shall be used to calculate the cutting speed v_c

$$R_{th} = \frac{D}{2} - \sqrt{\frac{D^2 - a_e^2}{4}}$$

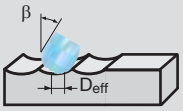


The reduction of the cutting width, ae. leads to an improvement of the surface quality of the workpiece (reduced peak-to-valley height).

14. HSC milling with corner radius - copy milling cutters / Torus milling



HSC milling & Torus milling
3D-machining with Torus milling cutters. Engagement of the tool predominantly on the corner radius. Improves the surface quality and the tool life. Of advantage when 3D-machining flat contour areas on 3-axis machines.

Symbol	Description	metric	Formula
z	No. of teeth		
D	Milling cutter diameter	mm	
a_p	Depth of cut	mm	
a_e	Width of cut	mm	
l_f	Milling length	mm	
n	Revolution per min.	U/min	$n = \frac{v_c \cdot 1000}{\pi \cdot D}$
v_c	Cutting speed	m/min	$v_c = \frac{\pi \cdot D \cdot n}{1000}$
v_f	Feed per min.	mm	$v_f = n \cdot z \cdot f_z$
f_z	Feed per tooth	mm	$f_z = \frac{v_f}{n \cdot z}$
f/U	Feed per revolution	mm	$f/U = \frac{v_f}{n}$
f/U	Feed per revolution	mm	$f/U = f_z \cdot z$
Q	Chip volume	cm^3/min	$Q = \frac{a_p \cdot a_e \cdot v_f}{1000}$
T	Milling time	min	$T = \frac{l_f}{v_f}$
hm	Average chip thickness	mm	$hm = fz \cdot \sqrt{\frac{a_e}{D}}$
$D_{(eff)}$	Effective diameter 	mm	$D_{(eff)} = 2 \cdot \sqrt{D \cdot a_p - a_p^2}$
	Effective diameter with approach angle 	mm	$D_{(eff)} = D \cdot \sin\left[\beta + \arccos\left(\frac{D - 2a_p}{D}\right)\right]$
R_{th}	Peak-to-valley height	mm	$R_{th} = \frac{D}{2} = \sqrt{\frac{D^2 - a_e^2}{4}}$
Z_b	Optimal step over for torus milling	mm	$Z_b = \frac{D - 2 \times R}{2}$

Tens. strength (N/mm²)	HRC	HB30	HV10
240		71	75
255		76	80
270		81	85
285		86	90
305		90	95
320		95	100
335		100	105
350		105	110
370		109	115
385		114	120
400		119	125
415		124	130
430		128	135
450		133	140
465		138	145
480		143	150
495		147	155
510		152	160
530		157	165
545		162	170
560		166	175
575		171	180
595		176	185
610		181	190
625		185	195
640		190	200
660		195	205
675		199	210
690		204	215
705		209	220
720		214	225
740		219	230
755		223	235
770		228	240
785		233	245
800	22	238	250
820	23	242	255
835	24	247	260
860	25	255	268
870	26	258	272
900	27	266	280
920	28	273	287
940	29	278	293
970	30	287	302
995	31	295	310
1020	32	301	317
1050	33	311	327
1080	34	319	336
1110	35	328	345
1140	36	337	355
1170	37	346	364

Tens. strength (N/mm²)	HRC	HB30	HV10
1200	38	354	373
1230	39	363	382
1260	40	372	392
1300	41	383	403
1330	42	393	413
1360	43	402	423
1400	44	413	434
1440	45	424	446
1480	46	435	458
1530	47	449	473
1570	48	460	484
1620	49	472	497
1680	50	488	514
1730	51	501	527
1790	52	517	544
1845	53	532	560
1910	54	549	578
1980	55	567	596
2050	56	584	615
2140	57	607	639
2180	58	622	655
	59		675
	60		698
	61		720
	62		745
	63		773
	64		800
	65		829
	66		864
	67		900
	68		940

Materials in mould making (selection)

Material nos.	Abbreviation	Tensile str.: N/mm²	Hardened: HRC
1.1520	C70W1	650 - 1100	
1.1525	C80W1	650 - 1100	
1.1554	C110W	660	
1.1645	C105W2	640	
1.1654	C110W	660	
1.1730	C45W3	640	46-56
1.1740	C60W3	700	
1.1744	C67W	730	
1.1750	C75W	700	
1.2003	75Cr1	680	50-61
1.2004	85Cr1	710	
1.2008	140Cr3	790	58-61
1.2060	105Cr5	700 - 1100	
1.2067	100Cr6	775	60-64
1.2080	X210Cr12	840	52-56
1.2082	X21Cr13	680	52-57
1.2083	X42Cr13	850	52-56
1.2085	X33CrS16	950 - 1100	46–50
1.2101	62SiMnCr4	760	40-64
1.2103	58SiCr8	775	
1.2127	105MnCr4	745	49-63
1.2162	21MnCr5	745	58-62
1.2201	X165CrV12	775	54-64
1.2206	140CrV1	710	58-65
1.2210	115CrV3	745	58-62
1.2235	80CrV2	840	56-61
1.2241	51CrMnV4	760	45-56
1.2242	59CrV4	760	50-60
1.2243	61CrSiV5	745	40-62
1.2248	38SiCrV6	720	42-56
1.2303	100CrMo5	775	
1.2307	29CrMoV9	810	
1.2311	40CrMnMo8-6	980 - 1120	33-50
1.2312	40CrMnMoS8-6	980 - 1120	33-50
1.2313	21CrMo10	680	
1.2316	X36CrMo17	840	46–50
1.2343	X37CrMoV5-1	780	48-54
1.2343	G-X38CrMoV5.1	780	52-54
1.2344	X40CrMoV5-1	625	50-55
1.2345	X50CrVMo5.1	800 - 1100	53-59
1.2346	G-X35CrMoV5.1	700 - 1100	
1.2347	X40CrMoVS5.1	700 - 1100	
1.2353	27CrMoV6-12	750	
1.2360	X48CrMoV8-1-1	810	50-56
1.2361	X91CrMoV18	890	59-61
1.2362	X63CrMoV5-1	760	59-62
1.2363	X100CrMoV5	775	59-63
1.2365	X32CrMoV3.3	775	42-52
1.2367	X38CrMoV5.3	780	45-55
1.2369	81CrMoV42.16	840	58-62
1.2376	X96CrMoV12	840	57-62
1.2378	X20CrVMo12-2	860	59-62
1.2379	X155CrMoV12-1	840	58-63
1.2380	X220CrVMo13.4	900 - 1100	58-64
1.2381	73MoV5.2	950	54-60
1.2392	G-X28CrMoV5.1	500 - 1100	
1.2414	120W4	745	
1.2419	105WCr6	775	54-63
1.2436	X210CrW12	860	60-64
1.2442	115W8	745	58-66
1.2453	X130W5	760	60-67
1.2510	100MnCrV4	775	57-64
1.2516	120WV4	775	58-62
1.2519	110WCrV5	760	58-62
1.2542	45WCrV7	760	48-57
1.2550	60WCrV7	760	52-60
1.2552	80WCrV8	775	52-60
1.2562	142WV13	810	60-66
1.2564	X30WCrV4.1	775	46-50
1.2567	X30WCrV5.3	810	46-50
1.2581	X30WCrV9.3	810	46-50
1.2601	X165CrMoV12	860	58-63

Material nos.	Abbreviation	Tensile str.: N/mm²	Hardened: HRC
1.2603	45CrVMoW5-8	810	48-51
1.2604	75WCrMoV2-2	760	48-56
1.2606	X37CrMoW5.1	775	48-56
1.2622	X60WCrMoV9.4	910	53-56
1.2631	X50MoW9.11	775	55-58
1.2662	X30WCrCoV9-3	840	48-52
1.2678	X45CoCrWV5.5.5	875	48-56
1.2703	74NiCr2	830	60
1.2706	X3NiCrMo18.8.5	500 - 1100	48-56
1.2709	X3NiCoMoTi18.9.5	910	42-55
1.2710	45NiCr6	810	
1.2711	54NiCrMoV6	760	42-50
1.2713	55NiCrMoV6	810	42-50
1.2714	56NiCrMoV7	840	42-48
1.2718	55NiCr10	840	48-59
1.2721	50NiCr13	840	55-59
1.2726	26NiCrMoV5	810	
1.2731	X50NiCrWV13.13	800 - 1000	
1.2737	28NiCrV5	810	
1.2738	40CrMnNiMo8	980-1100	51-55
1.2740	28NiCrMoV10	810	51-56
1.2743	60NiCrMo12.4	780	48-59
1.2744	57NiCrMoV7.7	840	45-52
1.2746	45NiCrMoV16-6	995	48-55
1.2747	28NiMo17	965	48-56
1.2762	75CrMoNiW6.7	710	58-62
1.2764	X19NiCrMo4	860	58-62
1.2766	35NiCrMo16	875	
1.2767	X45NiCrMo4	880	52-56
1.2782	X16CrNiSi25.20	500 - 1100	
1.2786	X13NiCrSi36.16	500 - 1100	
1.2838	145V33	775	
1.2842	90MnCrV8	775	60-64
1.2880	X165CrCoMo12	875	60-65
1.2884	X210CrCoW12	875	60-66
1.2885	X32CrMoCoV3.3.3	775	48-54
1.2886	X15CrCoMoV10.10.5	1075	44-53
1.3253	S-4-3-8	875	62-66
1.3343	S 6-5-2	875	62-66
1.3401	X120Mn12	780 - 1130	
1.3402	X110Mn14	850 - 1000	
1.3405	X90Mn18	1400	
1.4005	X12CrS13	650 - 850	
1.4006	X12Cr13	590 - 780	
1.4021	X20Cr13	750 - 950	
1.4105	X4CrMoS18	430 - 630	
1.4109	X65CrMo14	800 - 900	56-58
1.4112	X90CrMoV18	780 - 840	55-58
1.4117	X38CrMoV15	800 - 900	
1.4301	X5CrNi18.10	580 - 760	
1.4305	X10CrNiS18.9	490 - 690	
1.4404	X2CrNiMo17.13.2	700	
1.4541	X6CrNiTi18.10	500 - 700	
1.4571	X6CrNiMoTi17.12.2	500 - 730	
1.6580	30CrNiMo8	1000 - 1450	
1.6582	34CrNiMo6	900 - 1400	
1.6587	17CrNiMo6	650	
1.7131	16MnCr5	875	58-62
1.7139	16MnCrS5	780 - 1080	
1.7147	20MnCr5	980 - 1270	
1.7149	20MnCrS5	980 - 1270	
1.7220	34CrMo4	800 - 1200	
1.7223	41CrMo4	800 - 1000	
1.7225	42CrMo4	900 - 1050	53-57
1.7227	42CrMoS4	900 - 1100	
1.7228	50CrMo4	900 - 1100	
1.8159	50CrV4	900 - 1100	



Online shop

- check prices and see if an item is in stock in real time
- download tool data
- automatic reordering thanks to subscription function

Individual authorisation management and maximum access security for your account

Personal purchasing conditions are stored in the system

Provision of CAD data and cutting values

Information on tool availability and stock information

Intelligent search function thanks to advanced search criteria and ordering via own material numbers

Detailed documentation and history of your order processes along with a watch list for future purchases

Easy forwarding of shopping carts for approval and release

OCI interface, data interface

webshop.guehring.de/en/

Quality features

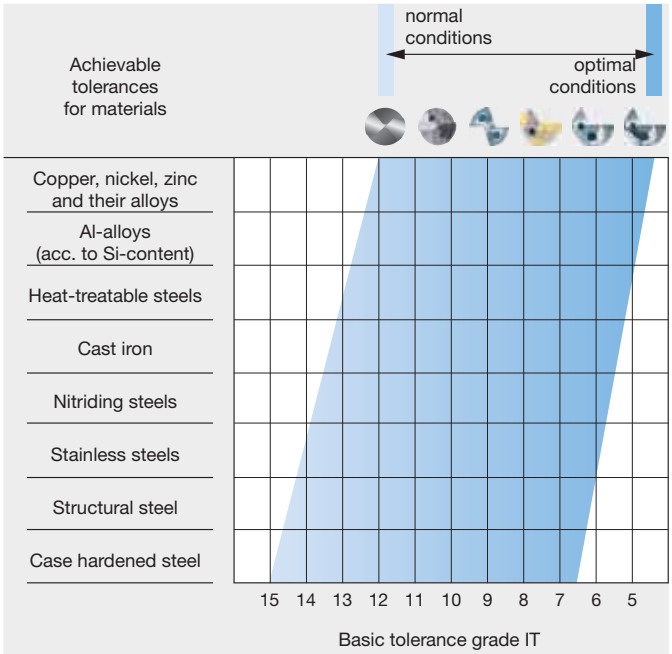
In machining technology, if the drilling depth is 15xD or deeper, this is referred to as deep hole drilling.
Today, Gühring's range comprises:

- classical single-fluted gun drills made of solid carbide or with a brazed carbide head
- classical two-fluted gun drills with a brazed carbide head
- replacement system with replaceable solid carbide cutting edges and supporting strips
- spiralled solid carbide or HSS/HSCO deep hole drills

The right tool is selected depending on the type of application and the required quality of the drilled hole.
The following diagrams provide guidance on which tool to choose:

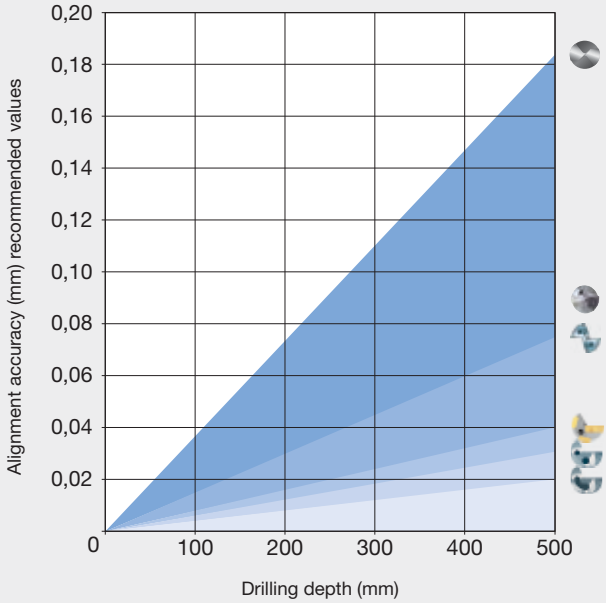
Basic tolerances

Depending on their shape and design, different types of tools result in different basic tolerances. The single-fluted drill creates extremely precise drilled holes. Under optimum conditions, it is possible to achieve tolerance grades of up to IT5 with a single-fluted gun drill.



Alignment accuracy

The straightness of hole describes a deviation in direction. This is influenced by the centring of the tool during spot drilling and depends on the shape and position of the pilot hole or drill bush. The properties of the material or workpiece as well as the stability of the tool and machine also influence the straightness.



Peak-to-valley height class		N12	N11	N10	N9	N8	N7	N6	N5	N4	N3
EB 100/EB 80 deep hole drilling											
EB 800 deep hole drilling											
ZB 80/RT 100 T deep hole drilling											
HSS/HSCO deep hole drilling											
EB 100/80/800 Pilot drilling											
Surface values	Rz (µm)	160	100	63	40	15,6	7,87	4,65	2,60	1,74	0,81
Roughness values	Ra (µm)	50	25	12,5	6,3	3,2	1,6	0,8	0,4	0,2	0,1

normal conditions (recommended values)
ideal conditions

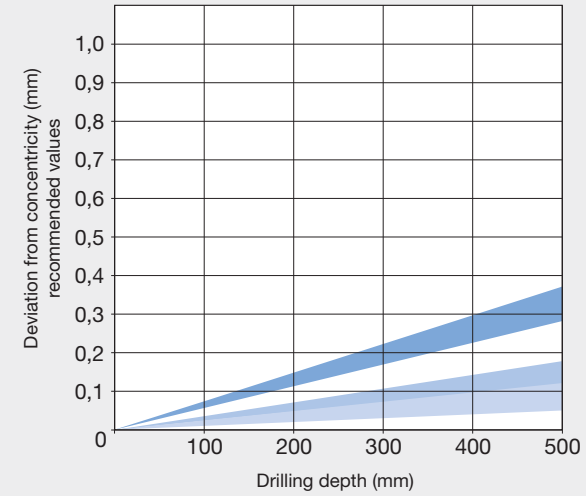
Surface quality

The roughness of the drilled hole is influenced by many factors. The most important of these are the material, the cooling lubricant and the type and geometry of the tool. When drilling with single-fluted drills, the guide pads smooth the bore wall further. This is not the case for drills with several cutting edges. The final quality of the surface is dependent on the surfaces of the tool (e.g. coating) or edge conditions (wear) on the primary and secondary cutting edges.

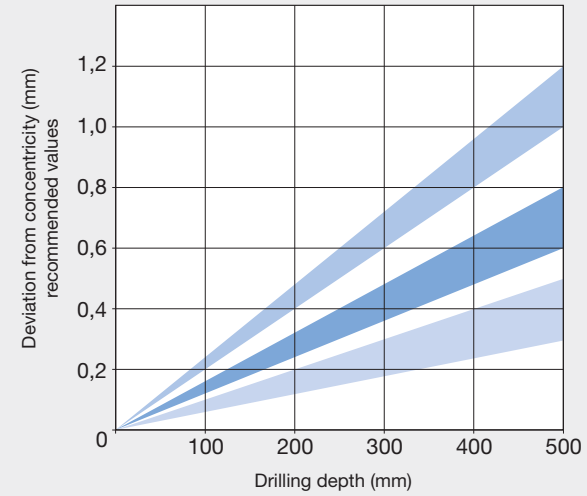
Deviation from concentricity

The deviation from concentricity describes a continuous displacement of the tool with increasing drilling depth. This curve is affected not only by the drill's geometric properties, but also by the cutting conditions, the material structure and the temperatures. Optimum results are achieved when machining with counter-rotating speeds of the workpiece and tool. A single-fluted drill achieves lower deviation from concentricity values than drills with several cutting edges.

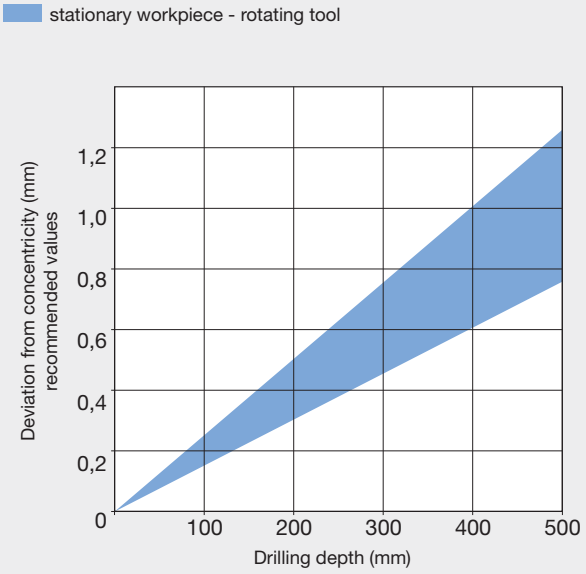
EB 100/EB 80/EB 800



ZB 80/RT 100 T



HSS/HSCO



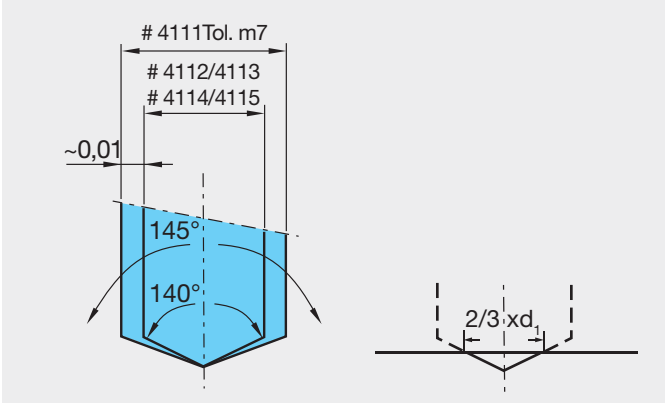
Centring and pilot drilling

Centring and pilot drilling for HT 800

Generally we recommend centring/pilot drilling for HT 800 with drilling depths above 5xD.

When centring, the drilling diameter should be approximately 2/3 of the hole diameter to be produced. With pilot drilling we recommend a drilling depth of 1xD. In addition, the point angle as well as the diameter of the pilot drill should be larger than the point angle and the diameter of the following drill.

To ensure this, we recommend the application of the adapted pilot drilling inserts art. no 4111 with 145° point angle and m7 diameter tolerance in an extra short, rigid holder art. no. 4105.

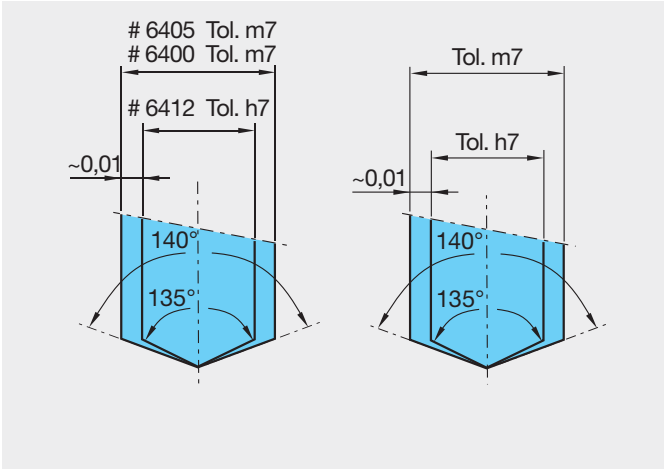


Centring and pilot drilling for solid carbide

When applying solid carbide drills for drilling depths 7xD to 12xD we recommend centring or the production of a pilot hole with a depth of 1xD to 2xD.
With drilling depths larger than 12xD a pilot hole with a depth of 1xD to 2xD is imperative.

With pilot drilling for the Exclusive Line micro-precision drill with 15xD (art. no. 6412) we recommend the application of Exclusive Line micro-precision drill 4xD without internal cooling (art. no. 6400) or 5xD with internal cooling (art. no. 6405), as they are optimally adapted regarding point angle and diameter tolerance.

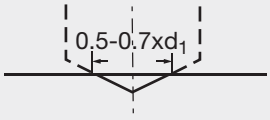
When pilot drilling for deep hole drills eg. type RT100T, a Ratio drill type RT100U with internal cooling, 3xD (e.g. art. no. 5510) can be applied, as it is optimally suited regarding point angle and diameter tolerance.



Centring and pilot drilling for HSS

Centring with drill lengths to DIN 340

When using long series drills (DIN340) in HSS/HSCO, we recommend spot drilling with a spotting diameter of 0.5 to 0.7xD (D = drill diameter). HSS NC spotting drills are optimally suited for this process. Detailed information regarding NC spotting drills can be found in the NC spot drilling section.



Pilot drilling with drill lengths to DIN 1869

When applying extra length HSS/HSCO drills to DIN 1869 we recommend the production of a pilot hole with a depth of 1xD to 2xD.
Stub drills type GV 120 to DIN 1897 are optimally suited.

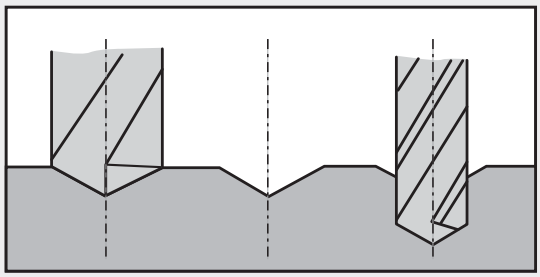
Spotting strategies

NC spotting drills

When producing accurately positioned holes, holes with close diameter tolerances, deep holes or generally with unfavourably shaped workpieces (round, rough. etc.) it's recommended to use a NC spotting drill. This ensures the following drill, drills accurately and prevents the drill from running off.

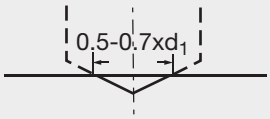
NC spotting drills can also be used to produce chamfers or countersinks (when using a spot drill with a larger diameter than the actual hole) and centring in one operation.

NC spotting drills are designed with a very short flute length and without body clearance to ensure a very rigid design and therefore accurately positioned spotting. Due to the design, NC spot drills are only suitable for spotting, drilling depths must not exceed the length of the point geometry.



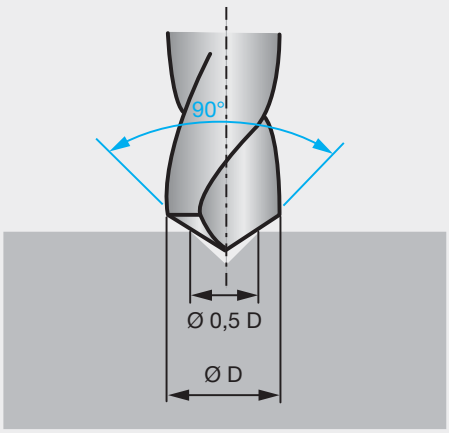
Selecting an NC spotting drill

Ideally, the spotting diameter should be chosen between 0.5 to 0.7xD.



90° NC spotting drills

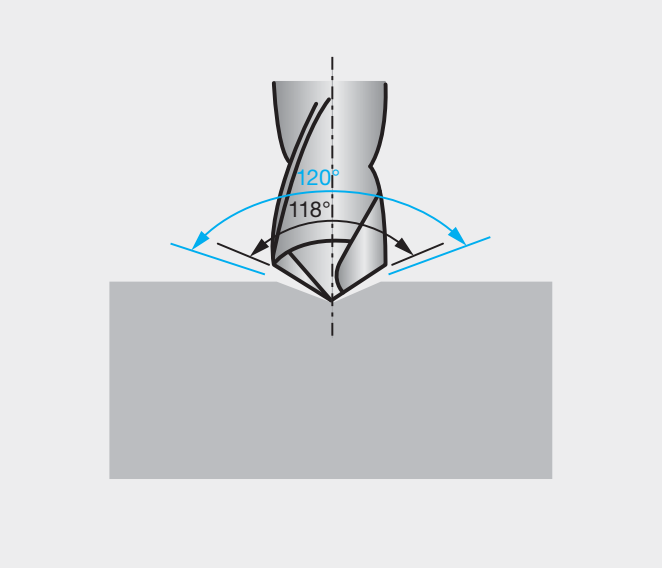
NC spotting drills with a 90° point angle are ideally suited for spotting if the following HSS/HSCO drills have a relatively large chisel edge. This ensures that the following HSS/HSCO drill drills with the cutting lip first and is guided by the most stable points of the cutting edge.
In addition, NC spotting drills with a 90° point angle are used to produce a 90° countersink and centre in one operation if the spotting diameter is larger than the actual hole diameter.



Spotting strategies

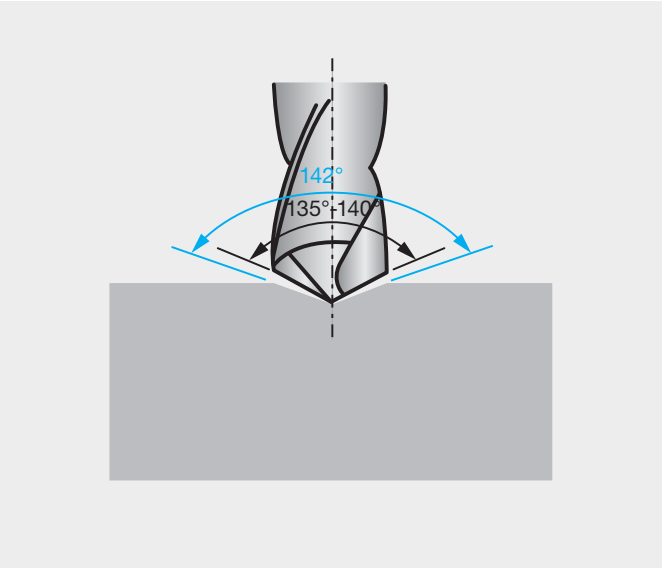
120° NC-spotting drills

NC-spotting drills with a 120° point angle are specially suited for spotting operations if the actual hole is subsequently produced with HSS/HSCO drills with a 118° point angle. This ensures the following HSS/HSCO drill spots with the point first and is well guided.



142° NC-spotting drills

NC-spotting drills with 142° point angle are specially suited for spotting operations if the actual hole is subsequently produced with carbide drills with a 135° - 140° point angle. This ensures the following carbide drill spots with the point first, centers and is well guided. If the cutting corners of the carbide drill meet the material to be machined before the point, there is the risk of corner crumbling with carbide drills.



NC spotting drills

90°	120°	142°
		

A brief introduction to the subject of deep hole drilling

In the machining world, drilling depths of 15 x D and deeper are regarded as deep hole drilling operations, whereby smaller drilling depths can naturally also be produced with gun drills. Advantage is taken of the positive side effects, as for example good surface quality, low deviation from concentricity and optimised alignment accuracy.

High pressure cooling -
has become a matter of course.

In recent years, internal cooling has established itself for all drilling tools. Coolants are now living up to their name and being supplied via coolant ducts to where they are urgently required. Considerable improvements in tool life and less breakages have been achieved by this measure for twist drills, taps etc. Every conventional machine tool currently on the market can be supplied with high pressure internal cooling and is therefore also suitable for deep hole drilling. The share of gun drills on machining centres, lathes etc. is forever gaining more importance. The process is therefore increasing in popularity in the machining world.



All gun drills must have support for the pilot hole. Gun drills must never operate at full speed without support in the machine shop.

Deep hole drilling is not a closed book, but can be mastered by anybody as long as certain conditions are adhered to. Recommended cutting rates for the application of Guhring gun drills can be found in the chapter GÜHRINGNAVIGATOR.

Application advice

- When using classical deep hole drills with a steel shank, EB 80, EB 800 and ZB 80, to drill to depths greater than 40xD, we recommend the use of two or more deep hole drills, e.g. Ø 10x400 mm und Ø 9,95x800 mm.
- The EB 100 M solid carbide deep hole drills and the brazed EB 100 can achieve a maximum drilling depth of 80xD with only one tool.
- Deep hole drills for drilling to depths greater than 40xD should be introduced into the pilot hole with anti-clockwise rotation.
- When changing tools at a depth greater than 40xD, the tool can be damped by switching on the high-pressure internal cooling for approximately one second.
- For machining long-chipping materials, we recommend the use of Deep hole drills with polished flutes.
- As a general rule, we recommend setting the oil content of the emulsion to at least 8 %.
- Single-fluted gun drills for long-chipping aluminium should be ordered with a 180° point grind and coolant chamber.
- Firmly seated steady rest bushings dampen the drilling process and improve the quality of the bore.
- To avoid a step between the pilot hole and the deep hole, a smooth transition can be achieved with head form G and a pilot hole that is slightly undersized.
- In the case of long chip formation, a periodic interruption in the feed (without withdrawal) can facilitate the machining process.

The drilling process on conventional machines (BAZ)

The work steps for deep hole drilling

- production of pilot hole
- enter at low revolutions
- setting of coolant pressure and speed
- continuous drilling to required drilling depth without pecking
- switching off coolant supply after reaching the required hole depth
- retraction of the tool from the hole

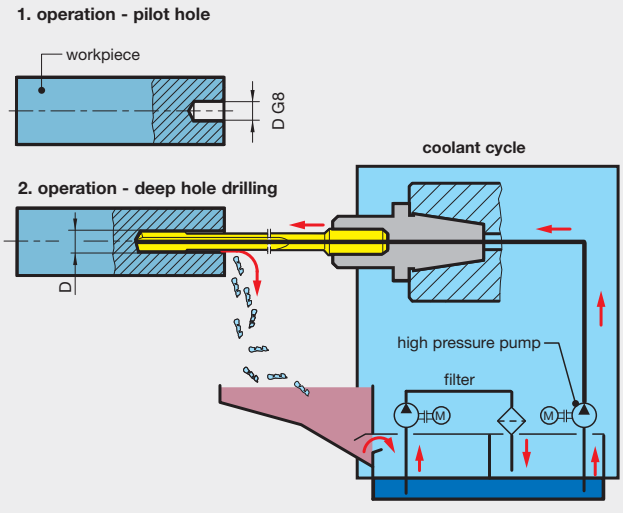
Cutting parameters can be reduced if cooling parameters are insufficient.
Pressure increase systems are also an option.

Procedure

In order to achieve optimal machining results when producing deep holes especially spotting on radii and/or on an uneven surface structure, we recommend the following machining steps:

1. Initial milling of the surface, e.g. with the RF 100 Diver including centre cut. The surface must be machined at right angles to the entry angle of the drilling operation.
2. Drilling of a cylindrical pilot hole, e.g. with the RT 100 U. Thanks to its point angle of 140° and its Ø tolerance m7, this drill is ideally suited for this machining step.
3. Drilling into the pilot hole with a speed of approximately 200 rpm and a feed rate of approximately 500 mm/min with anti-clockwise rotation.
4. Adjustment of the cooling lubricant pressure and the rotational speed.
5. Uninterrupted drilling to the required drilling depth without chip removal. When using deep hole drills with a very large length/diameter ratio (e.g. solid carbide single-fluted drills with flute lengths greater than 160 mm), we recommend drilling with reduced cutting parameters (approx. 75 % of the optimal cutting speed) to a drilling depth of around 25 mm.
6. For through holes with a straight exit, i.e. 90°, reduce the feed speed v_f to 50 % approximately 1 mm before breaking through.
7. For through holes with an inclined exit, reduce the feed speed v_f to 40 % approximately 1 mm before breaking through.
8. After reaching the required drilling depth, switch off the speed and cooling lubricant and retract the drill at a speed of no more than 5,000 mm/min.

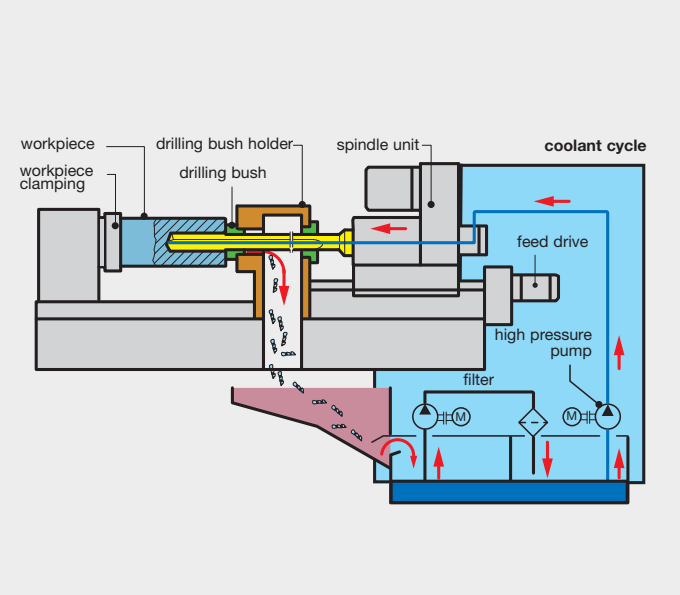




The drilling process on deep hole drilling machines

Where mass production, milling of very deep holes and high quality surface finishes are required, deep-hole drilling machines are used. A nearly endless range of drilling depth becomes available. The gun drill is guided by steady rest bushes. The accordion-like movement of the bushes allows a continuous drilling. „Drilling without pecking“.

Pilot holes are not needed, thus reducing, time and costs for tool change. Offering a greater drilling depth (up to a couple of meters), and at the same time, an excellent drilling quality. High pressure pumps and a coolant filter system guarantuee maximum process security. The total length of the steady rest bushings and the drill bush support equals the so-called length loss, which is decisive for calculating the length of the tool.

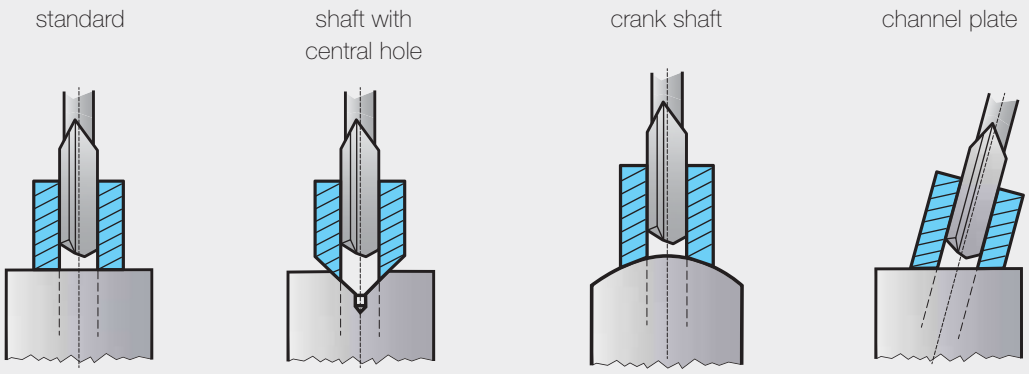




Pilot hole and drill bush

Since the single-fluted gun drill is a tool with only one cutting edge and cannot centre itself automatically, the tool must be guided with a drill bush or pilot hole. Self-centering two-fluted drills also have to be guided by drill bushes or pilot holes, however, as they could otherwise start to vibrate.

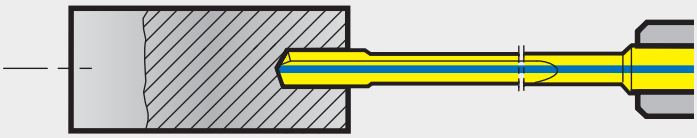
Example drill bush with art. no. 5747 (HSS) / 5748 (solid carbide)



To take into account when using drill bushes

- The drill bush must be in positive contact with the spot drilling contour.
- There should be as little play as possible between the drill bush and the tool.
- If the deep hole drill has a guide diameter, the drill bush should be at least long enough to guide both head types when spot drilling.
- The condition of the drill bush must be regularly checked to prevent any negative effects on the tool.
- We recommend HSS drill bushes for small series and solid carbide drill bushes for large series.

Example Pilot drilling

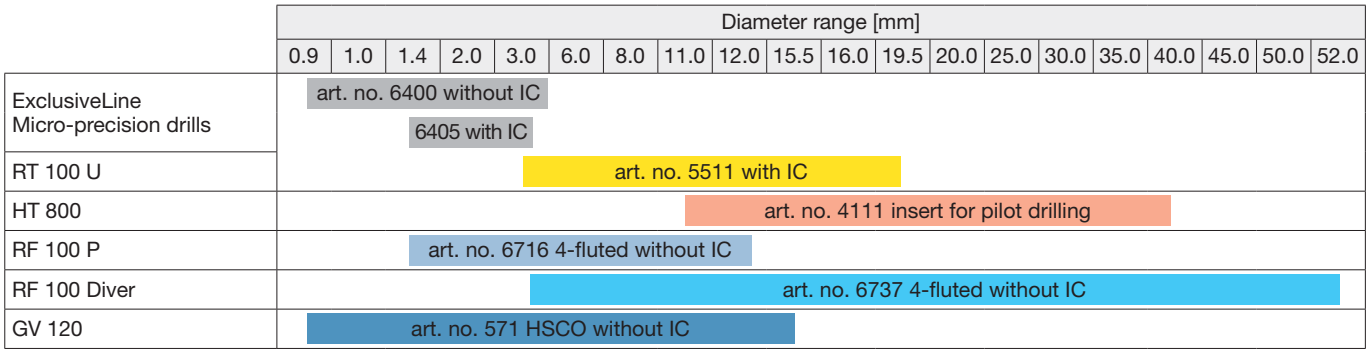


Guide values for the pilot hole depth

conv. deep hole drills	Ø nom. follow-on tool				
drilling depth	Ø 0.900-1.799	Ø 1.800-3.999	Ø 4.000-7.999	Ø 8.000-11.999	Ø 12.000-52.000
up to 20xD	3.0xD	2.5xD	2.0xD	1.5xD	1.5xD
up to 30xD		3.0xD	2.5xD	2.0xD	
up to 40xD		4.0xD	3.0xD	2.5xD	

Pilot hole and drill bush

Range of applications for pilot tools



ExclusiveLine Micro-precision drills
- for pilot holes <Ø3.000/EB 100, EB 80
- for standard situations/flat spotting surface

RT 100 U
- universal pilot tool Ø3.000-19.500/EB 100, EB 80, ZB 80, EB 800, RT 100 T
- for standard situations/flat spotting surface

HT 800
- insert pilot tool Ø11.000-40.000/EB 100, EB 80, ZB 80, EB 800, RT 100 T
- for standard situations/flat spotting surface

RF 100 P
- milling cutter for high-precision pilot holes Ø1.400-12.000/EB 100, EB 80, ZB 80, EB 800, RT 100 T
- for standard and special situations/flat, angled, cubic or other spot drilling surfaces

RF 100 Diver
- milling cutter for high-precision pilot holes Ø4.000-52.000/EB 100, EB 80, ZB 80, EB 800, RT 100 T
- for standard and special situations/flat, angled, cubic or other spot drilling surfaces

GT 100
- HSS pilot drills Ø2.500-13.000/HSS deep hole drills
- for standard situations/flat spotting surface

Please observe the following for pilot holes

- The pilot hole diameter tolerance should be G8 and the nominal tool tolerance always Ø **m7**.
- If the single-fluted gun drill has a guide diameter, the pilot hole should be at least deep enough to support both head forms when spot drilling.
- Depending on the application, it may be advantageous if the pilot hole has an entry chamfer.
- If there are strict requirements regarding the position and concentricity of the deep drilled hole, then the pilot hole should be milled or be drilled on a lathe.

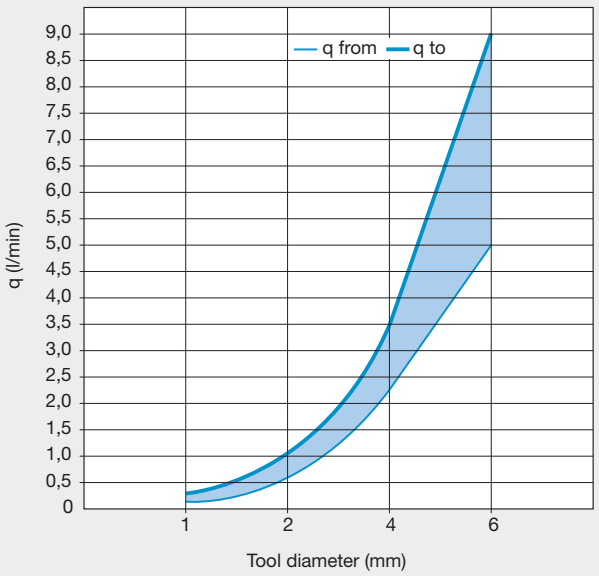
Important:
The quality of the drill bush and of the pilot hole has a very large influence on the deviation from concentricity and the tool life of the follow-on tool.

Cooling lubricant data

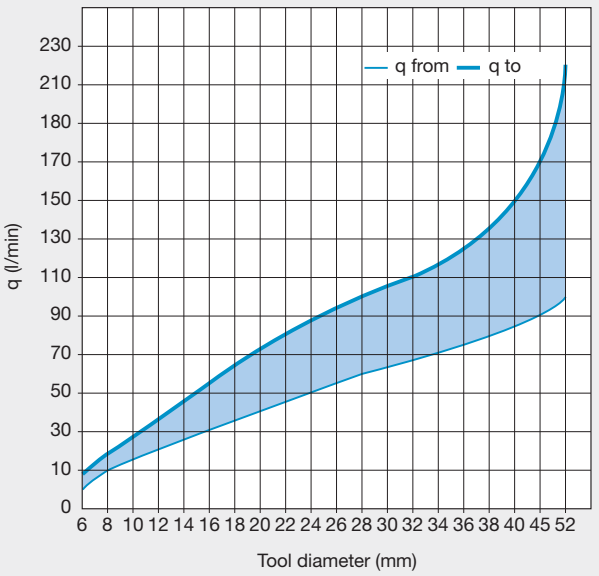
Please note:

- All gun drills must be applied with internal cooling, either air, water or oil.
  Internal cooling ensures better chip removal.
- All gun drills can be applied with oil as the medium for internal cooling.
  In this case, however, a higher pressure is required than with emulsions in order to obtain the same amount of coolant.
- When MQL is applied with gun drills an increase in pressure may be necessary for smaller nominal diameters
  dependent on the pressure of the MQL system.
- If the cooling lubricant data is insufficient the cutting parameters may be reduced. Pressure boosting systems
  are also possible.
- With increased gun drill length a pressure increase has to be expected to transport the required coolant volume through
  the coolant ducts.

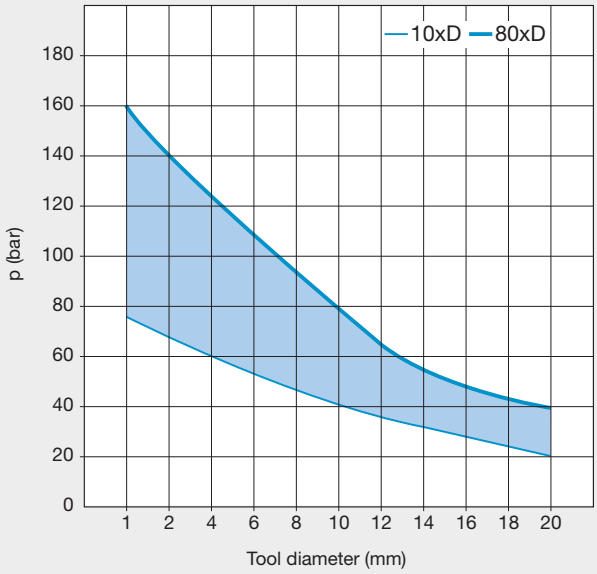
General flow data
EB 100/EB 80/EB 800/ZB 80



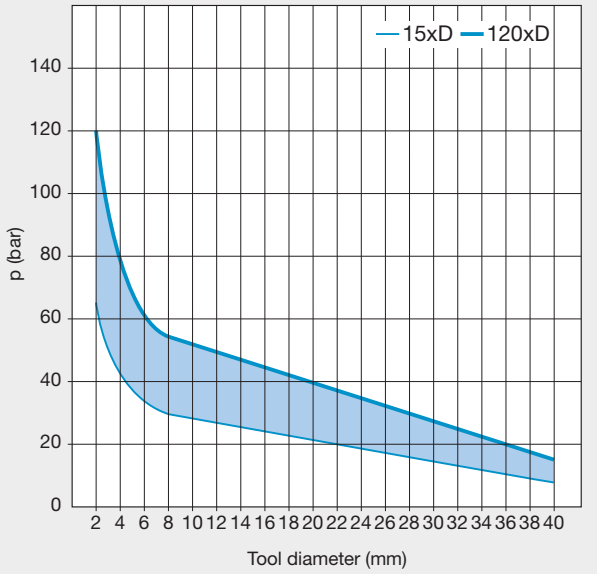
General flow data
EB 100/EB 80/EB 800/ZB 80



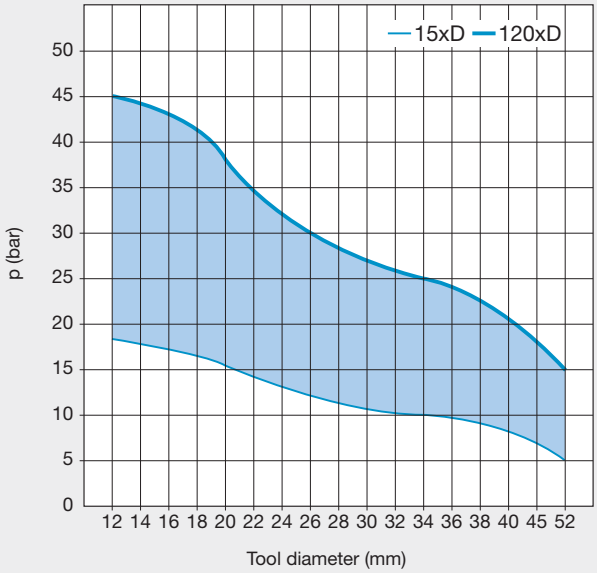
EB 100 Pressure specifications
depending on tool length



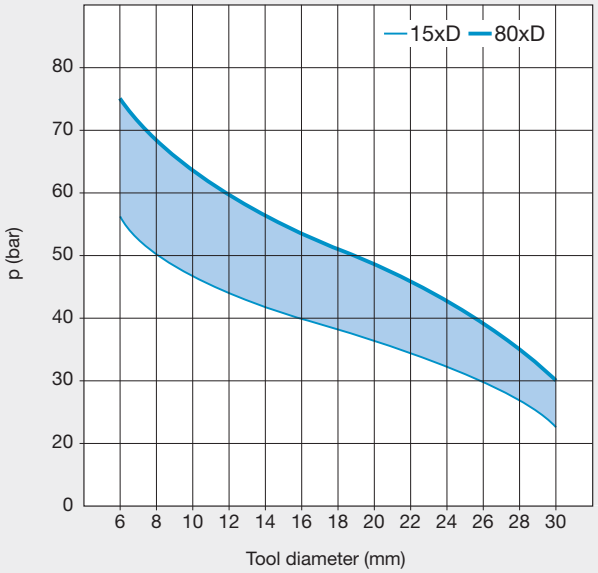
EB 80 Pressure specifications
depending on tool length



EB 800 Pressure specifications
depending on tool length



ZB 80 Pressure specifications
depending on tool length

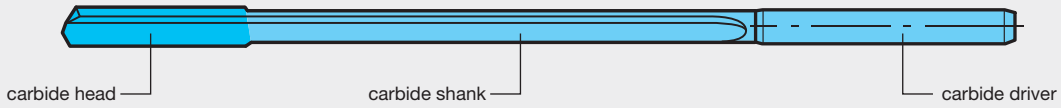


Characteristics

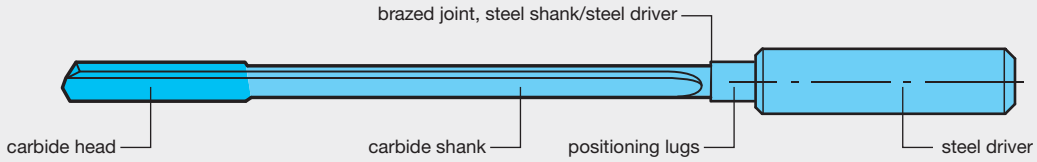
Range of applications

	Diameter range																		
	0.9	1.0	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	52.0
EB 100 M		max. total length 615 mm																	
EB 100		max. total length 615 mm																	
EB 80				max. total length 3.600 mm															
ZB 80						max. total length 1.000 mm													
EB 800									max. total length 3.600 mm										

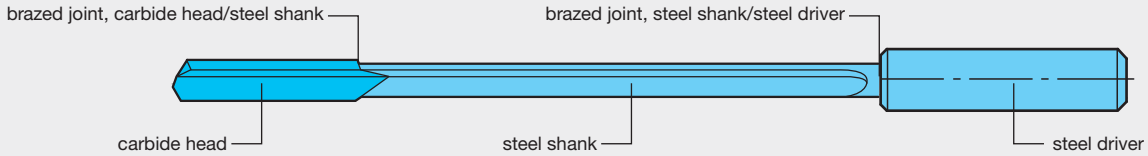
EB 100 M



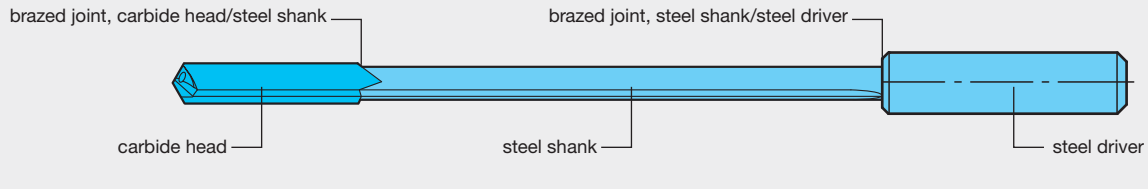
EB 100



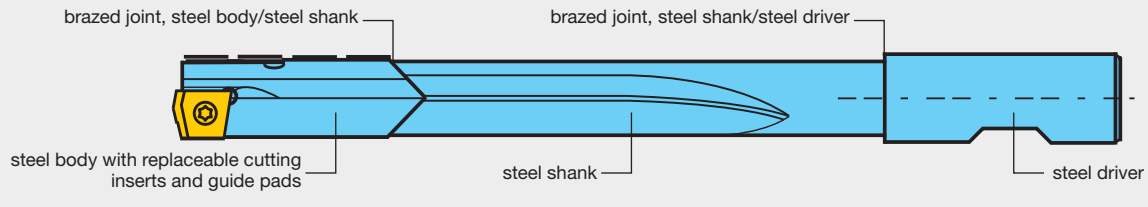
EB 80



ZB 80



EB 800



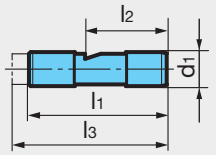
The range of drivers introduced below is available ex stock. However, it only represents a small selection of drivers from our complete range. We naturally also produce individual drivers of the highest precision to customer drawings.

Attention! EB 100 requires drivers with positioning lugs. Further information on request.

Drivers for EB 80

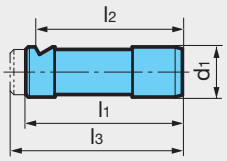
Drivers for deep drilling machines

1 TBM-SEV



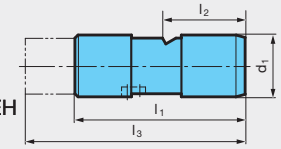
Code no.	d_1	l_1	l_2	l_3
1.1	10	40	24	-
1.2	10	40	24	45
1.3	10	40	24	55
1.4	16	45	31.2	-
1.5	25	70	34	-
1.6	25	70	34	78

2 TBM-SV



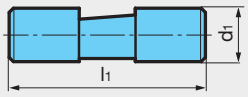
Code no.	d_1	l_1	l_2	l_3
2.1	16	50	47	-
2.2	16	50	47	55
2.3	16	50	47	70

3 TBM-SEH



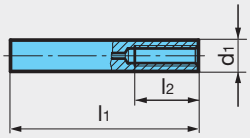
Code no.	d_1	l_1	l_2	l_3
3.1	25	70	34	-
3.2	25	70	34	100
3.3	25	70	34	105

4 TBM-SFM



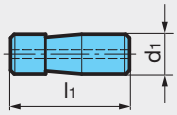
Code no.	d_1	l_1
4.1	19,05	70
4.2	12,7	70
4.3	25,4	70
4.4	31,75	70
4.5	38,1	70

5 TBM-SGI



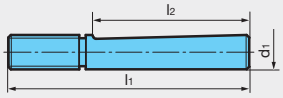
Code no.	d_1	l_1	l_2
5.1	10	60	20
5.2	16	80	28
5.3	25	100	50
5.4	10	100	20
5.5	10	110	24

6 TBM-SKM



Code no.	d_1	l_1
6.1	12.7	38
6.2	19.05	70
6.3	38.1	70

7 TBM-TRG

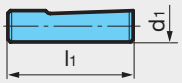


Code no.	d_1	l_1	l_2
7.1	16	112	73
7.2	20	126	82

Drivers to DIN 1835

9 TBM-SEV

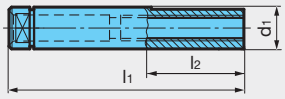
form HE



Code no.	d_1	l_1
9.1	8	36
9.2	10	40
9.3	12	45
9.4	16	48
9.5	20	50
9.6	25	56
9.7	32	60
9.8	31.75	70
9.9	38.1	70
9.10	40	70

Drivers to VDI-draftrf

12 TBM-VDI

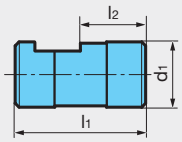


Code no.	d_1	l_1	l_2
12.1	10	68	40
12.2	16	90	40
12.3	25	112	50

also be used for deep hole drilling machines

Drivers to Speed-Bit-System

13 TBM-SPB



Code no.	d_1	l_1	l_2
13.1	16	40	14
13.2	25	50	25
13.3	35	60	20

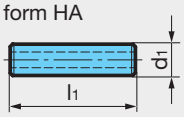
also be used for deep hole drilling machines

Drivers for EB 80

Drivers to DIN 6535

10

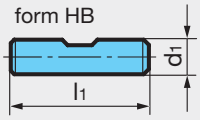
form HA



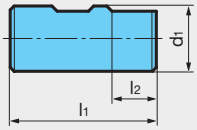
Code no.	d_1	l_1
10.1	8	36
10.2	10	40
10.3	12	45
10.4	16	48
10.5	20	50
10.6	25	56
10.7	32	60
10.8	25	70
10.9	40	70

8

form HB



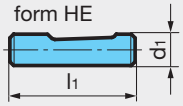
from code no. 8.6



Code no.	d_1	l_1	l_2
8.1	8	36	-
8.2	10	40	-
8.3	12	45	-
8.4	16	48	-
8.5	20	50	-
8.6	25	56	17
8.7	32	60	19
8.8	40	70	19
8.9	50	80	23
8.10	63	90	23

11

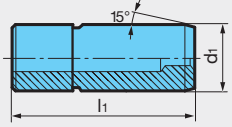
form HE



Code no.	d_1	l_1
11.1	8	36
11.2	10	40
11.3	12	45
11.4	16	48
11.5	20	50
11.6	25.4	70
11.7	25	56
11.8	32	60
11.9	40	70

16

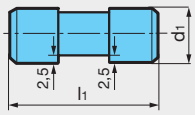
sim. form HA (shrinkable)



Code no.	d_1	l_1
16.1	10	50
16.2	16	64
16.3	20	70
16.4	25	81
16.5	32	92

17

sim. form HE



Code no.	d_1	l_1
17.1	19.05	70
17.2	25.4	70
17.3	31.75	70
17.4	38.1	70

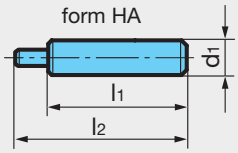
also be used for
deep hole drilling machines

Drivers for EB 100

Drivers with positioning lugs to DIN 6535

18

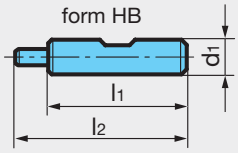
form HA



Code no.	d_1	l_1	l_2
4	4	28	40
6	6	36	51
10	10	40	55
12	12	45	60
16	16	48	63

19

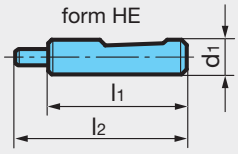
form HB



Code no.	d_1	l_1	l_2
4	4	28	40
6	6	36	51
10	10	40	55
12	12	45	60
16	16	48	63

20

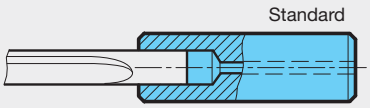
form HE



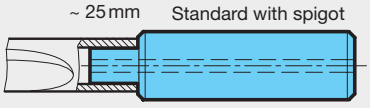
Code no.	d_1	l_1	l_2
4	4	28	40
6	6	36	51
10	10	40	55
12	12	45	60
16	16	48	63

Driver variations to suit gun drill tubes

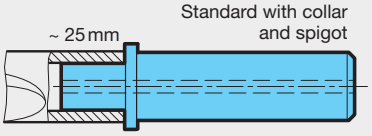
Solution for nom.-Ø < driver-Ø
(difference must be appr. 6 mm):
tube shank installed in driver



Solution for nom.-Ø ≠ driver-Ø
(close to parallel):
tube shank installed over spigot



Solution for nom.-Ø > driver-Ø:
tube shank installed over spigot,
inside-Ø of tube shank >driver-Ø,
tube shank fits against collar shoulder.



Application recommendations

Pilot holes for drill lengths greater than DIN 1869

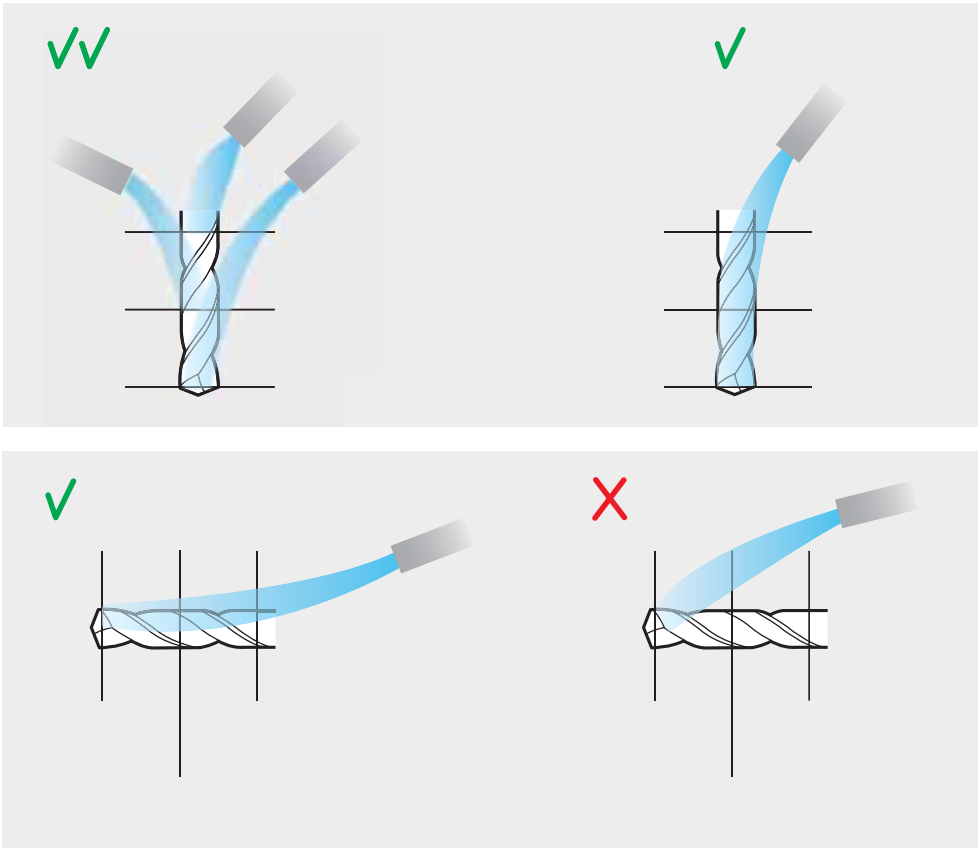
Before using the extra long HSS/HSCO drills according to DIN 1869 and factory standard, we recommend drilling a pilot hole.

The following must be observed:

- The depth of the pilot hole should be 2-3xD.
- The point angle of the pilot drill should be at least as large or larger than the point angle of the deep hole drill.
- The diameter of the pilot drill should be equal to or up to 0.1 mm larger than the diameter of the deep hole drill.
- We recommend the use of an extra short twist drill according to DIN 1897 to drill the pilot hole, or alternatively a short twist drill according to DIN 338.

Procedure

- The cooling lubricant supply must be adjusted in such a way that the entire cutting section of the deep hole drill is supplied with coolant.
- The approach to the component should be made with reduced rapid traverse, to avoid vibration of the deep hole drill.
- When introducing the deep hole drill into the pilot hole, we recommend reducing the rotational speed and feed speed by 50 %.
- As soon as the deep hole drill has reached 2/3 of the pilot hole depth, the rotational speed should be increased to the full working speed.
- Depending on the machining situation (vertical/horizontal machining) and the material to be machined, the chip removal cycles should be selected to allow optimum chip removal and avoid chip jams.
- The chip removal cycles can be run at working rotational speed and with an increased feed rate, making sure that a part of the deep hole drill – at least 1xD – always remains in the hole to keep it guided. Afterwards it is possible to advance to a depth of 2 mm before the previously drilled depth with the increased feed rate and the working rotational speed. The next drilling cycle is then started with the working feed rate and the working rotational speed.
- After the full drilling depth has been reached, it is possible to withdraw from the hole at the working speed and increased feed rate, provided that the hole was drilled with chip removal cycles.
  If drilling was carried out without chip removal cycles, we recommend reducing the rotational speed to 25 % of the working speed and slightly increasing the feed rate when withdrawing from the full drilling depth.



Tapping size holes for thread cutting

Std. ISO metric threads DIN 13

nom. Ø	pitch P	tapping size hole Ø DIN 336	core diameter of int. thread 6H*	
	mm	mm	min. mm	max. mm
M 1	0.25	**0.75**	0.729	0.785
M 1.1	0.25	**0.85**	0.829	0.885
M 1.2	0.25	**0.95**	0.929	0.985
M 1.4	0.30	**1.10**	1.075	1.142
M 1.6	0.35	**1.25**	1.221	1.321
M 1.8	0.35	**1.45**	1.421	1.521
M 2	0.40	**1.60**	1.567	1.679
M 2.2	0.45	**1.75**	1.713	1.838
M 2.5	0.45	**2.05**	2.013	2.138
M 3	0.50	**2.50**	2.459	2.599
M 3.5	0.60	**2.90**	2.850	3.010
M 4	0.70	**3.30**	3.242	3.422
M 4.5	0.75	**3.70**	3.688	3.878
M 5	0.80	**4.20**	4.134	4.334
M 6	1.00	**5.00**	4.917	5.153
M 7	1.00	**6.00**	5.917	6.153
M 8	1.25	**6.80**	6.647	6.912
M 9	1.25	**7.80**	7.647	7.912
M 10	1.50	**8.50**	8.376	8.676
M 11	1.50	**9.50**	9.376	9.676
M 12	1.75	**10.20**	10.106	10.441
M 14	2.00	**12.00**	11.835	12.210
M 16	2.00	**14.00**	13.835	14.210
M 18	2.50	**15.50**	15.294	15.744
M 20	2.50	**17.50**	17.294	17.744
M 22	2.50	**19.50**	19.294	19.744
M 24	3.00	**21.00**	20.752	21.252
M 27	3.00	**24.00**	23.752	24.252
M 30	3.50	**26.50**	26.211	26.771
M 33	3.50	**29.50**	29.211	29.771
M 36	4.00	**32.00**	31.670	32.270
M 39	4.00	**35.00**	34.670	35.270
M 42	4.50	**37.50**	37.129	37.799
M 45	4.50	**40.50**	40.129	40.799
M 48	5.00	**43.00**	42.587	43.297
M 52	5.00	**47.00**	46.587	47.297
M 56	5.50	**50.50**	50.046	50.796

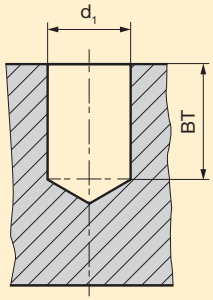
ISO metric fine threads DIN 13

nom. Ø	x	pitch P	tapping size hole Ø DIN 336	core diameter of int. thread 6H*	
		mm	mm	min. mm	max. mm
M 2.5	x	0.35	**2.15**	2.121	2.221
M 3.0	x	0.35	**2.65**	2.621	2.721
M 3.5	x	0.35	**3.15**	3.121	3.221
M 4.0	x	0.50	**3.50**	3.459	3.599
M 4.5	x	0.50	**4.00**	3.959	4.099
M 5.0	x	0.50	**4.50**	4.459	4.599
M 5.5	x	0.50	**5.00**	4.959	5.099
M 6.0	x	0.75	**5.20**	5.188	5.378
M 7.0	x	0.75	**6.20**	6.188	6.378
M 8.0	x	0.50	**7.50**	7.459	7.599
M 8.0	x	0.75	**7.20**	7.188	7.378
M 8.0	x	1.00	**7.00**	6.917	7.153
M 9.0	x	0.75	**8.20**	8.188	8.378
M 9.0	x	1.00	**8.00**	7.917	8.153
M 10	x	0.75	**9.20**	9.188	9.378
M 10	x	1.00	**9.00**	8.917	9.153
M 10	x	1.25	**8.80**	8.647	8.912
M 11	x	0.75	**10.20**	10.188	10.378
M 11	x	1.00	**10.00**	9.917	10.153
M 12	x	1.00	**11.00**	10.917	11.153
M 12	x	1.25	**10.80**	10.647	10.912
M 12	x	1.50	**10.50**	10.376	10.676
M 14	x	1.00	**13.00**	12.917	13.153
M 14	x	1.25	**12.80**	12.647	12.912
M 14	x	1.50	**12.50**	12.376	12.676
M 15	x	1.00	**14.00**	13.917	14.153
M 15	x	1.50	**13.50**	13.376	13.676
M 16	x	1.00	**15.00**	14.917	15.153
M 16	x	1.25	**14.80**	14.647	14.912
M 16	x	1.50	**14.50**	14.376	14.676
M 17	x	1.00	**16.00**	15.917	16.153
M 17	x	1.50	**15.50**	15.376	15.676
M 18	x	1.00	**17.00**	16.917	17.153
M 18	x	1.50	**16.50**	16.376	16.676
M 20	x	1.00	**19.00**	18.917	19.153
M 20	x	1.50	**18.50**	18.376	18.676
M 20	x	2.00	**18.00**	17.835	18.210
M 22	x	1.00	**21.00**	20.917	21.153
M 22	x	1.50	**20.50**	20.376	20.676
M 22	x	2.00	**20.00**	19.835	20.210
M 24	x	1.00	**23.00**	22.917	23.153
M 24	x	1.50	**22.50**	22.376	22.676
M 24	x	2.00	**22.00**	21.835	22.210
M 25	x	1.00	**24.00**	23.917	24.153
M 25	x	1.50	**23.50**	23.376	23.676
M 25	x	2.00	**23.00**	22.835	23.210
M 27	x	1.00	**26.00**	25.917	26.153
M 27	x	1.50	**25.50**	25.376	25.676
M 27	x	2.00	**25.00**	24.835	25.210
M 28	x	1.00	**27.00**	26.917	27.153
M 28	x	1.50	**26.50**	26.376	26.676
M 28	x	2.00	**26.00**	25.835	26.210
M 30	x	1.00	**29.00**	28.917	29.153
M 30	x	1.50	**28.50**	28.376	28.676
M 30	x	2.00	**28.00**	27.835	28.210
M 30	x	3.00	**27.00**	26.752	27.252
M 32	x	1.50	**30.50**	30.376	30.676
M 32	x	2.00	**30.00**	29.835	30.210
M 33	x	1.50	**31.50**	31.376	31.676
M 33	x	2.00	**31.00**	30.835	31.210
M 33	x	3.00	**30.00**	29.752	30.252
M 35	x	1.50	**33.50**	33.376	33.676
M 36	x	1.50	**34.50**	34.376	34.676

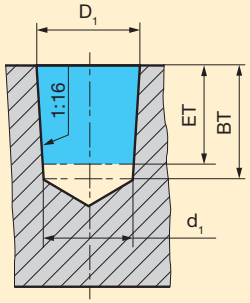
* M 1.1 up to M 1.4 tapping size hole of int. thread 5H

NPT ANSI B 2.1
American tapered pipe thread 1:16

Version A (avoid if possible)



Version B



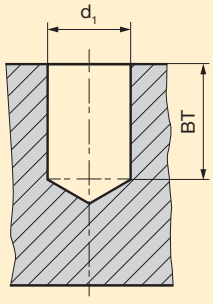
nom. Ø	threads per inch	tapp. size hole Ø cylindrical (A) d_1	tapp. size hole Ø conical (B) D_1	cutting depth ET mm	cutting depth BT (min) mm
1/16	- 27	**6.15**	6.39	9.29	10.7
1/8	- 27	**8.40**	8.74	9.32	10.8
1/4	- 18	**11.10**	**11.36**	13.52	15.6
3/8	- 18	**14.30**	**14.80**	13.83	16.0
1/2	- 14	**17.90**	**18.32**	18.07	20.8
3/4	- 14	**23.30**	**23.67**	18.55	21.3
1	- 11.5	**29.00**	**29.69**	22.29	25.6
1 1/4	- 11.5	**37.70**	**38.45**	22.80	26.1
1 1/2	- 11.5	**43.70**	**44.52**	22.80	26.1
2	- 11.5	**55.60**	**56.56**	23.20	26.5
2 1/2	- 8	**66.30**	**67.62**	31.75	36.3
3	- 8	**82.30**	**83.52**	33.74	38.5

Tapping size holes for thread cutting

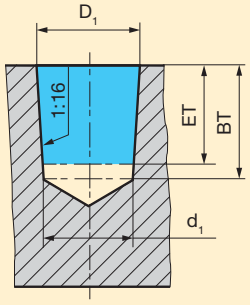
(Whitworth) threads (DIN-ISO 228-1)				
nom. Ø	threads	tapping size hole Ø DIN 336	core diameter of int. thread	
inch	per inch	mm	min. mm	max. mm
G 1/16	28	**6.80**	6.561	6.843
G 1/8	28	**8.80**	8.566	8.848
G 1/4	19	**11.80**	11.445	11.890
G 3/8	19	**15.25**	14.950	15.395
G 1/2	14	**19.00**	18.631	19.172
G 5/8	14	**21.00**	20.587	21.128
G 3/4	14	**24.50**	24.117	24.658
G 7/8	14	**28.25**	27.877	28.418
G 1	11	**30.75**	30.291	30.931
G 1 1/8	11	**35.50**	34.939	35.579
G 1 1/4	11	**39.50**	38.952	39.592
G 1 1/2	11	**45.25**	44.845	45.485
G 1 3/4	11	**51.00**	50.788	51.428
G 2	11	**57.00**	56.656	57.296

Rc (BSPT) DIN EN 10226-2 and ISO 7/1
tapered Whitworth pipe thread 1:16

Version A (avoid if possible)



Version B



nom. Ø	threads per inch	tapp. size hole Ø cylindrical (A) d_1	tapp. size hole Ø conical (B) D_1	cutting depth ET mm	cutting depth BT (min) mm
1/8	28	**8.20**	8.57	9.5	11.1
1/4	19	**10.85**	11.45	14.0	16.3
3/8	19	**14.30**	**14.95**	14.4	16.7
1/2	14	**17.80**	**18.63**	19.1	22.3
3/4	14	**23.20**	**24.12**	20.4	23.6
1	11	**29.20**	**30.29**	24.3	28.3

Recommended tapping size holes for thread forming

Std. ISO metric threads DIN 13

nom. Ø	pitch	tapp. size hole Ø	tapp. size hole Ø		core Ø of int. thread 7H*	
mm		mm	min. mm	max. mm	min. mm	max. mm
M1	0.25	**0.90**	0.89	0.92	0.729	0.819
M1.2	0.25	**1.10**	1.09	1.12	0.929	1.019
M1.4	0.30	**1.28**	1.27	1.30	1.075	1.181
M1.6	0.35	**1.46**	1.45	1.48	1.221	1.346
M1.7	0.35	**1.56**	1.55	1.58	1.321	1.446
M1.8	0.35	**1.66**	1.65	1.68	1.421	1.546
M 2	0.40	**1.85**	1.84	1.88	1.567	1.679
M 2.2	0.45	**2.00**	2.01	2.05	1.713	1.838
M 2.5	0.45	**2.30**	2.28	2.32	2.013	2.138
M 3	0.50	**2.80**	2.78	2.85	2.459	2.639
M 3.5	0.60	**3.25**	3.23	3.30	2.850	3.050
M 4	0.70	**3.70**	3.68	3.76	3.242	3.466
M 4.5	0.75	**4.20**				
M 5	0.80	**4.65**	4.62	4.71	4.134	4.384
M 6	1.00	**5.55**	5.52	5.62	4.917	5.217
M 7	1.00	**6.55**	6.52	6.62	5.917	6.217
M 8	1.25	**7.40**	7.36	7.47	6.647	6.982
M 9	1.25	**8.40**	8.36	8.47	7.647	7.982
M 10	1.50	**9.30**	9.26	9.38	8.376	8.751
M 11	1.50	**10.30**	10.26	10.38	9.376	9.751
M 12	1.75	**11.20**	11.15	11.29	10.106	10.531
M 14	2.00	**13.10**	13.05	13.20	11.835	12.310
M 16	2.00	**15.10**	15.05	15.20	13.835	14.310
M 18	2.50	**16.90**	16.83	17.02	15.294	15.854
M 20	2.50	**18.90**	18.83	19.02	17.294	17.854
M 22	2.50	**20.90**	20.83	21.02	19.294	19.854
M 24	3.00	**22.70**	22.62	22.80	20.752	21.382
M 27	3.00	**25.70**	25.62	25.80	23.752	24.382
M 30	3.50	**28.50**	28.40	28.60	26.211	26.921
M 33	3.50	**31.50**	31.40	31.60	29.211	29.921
M 36	4.00	**34.30**	34.17	34.40	31.670	32.420
M 39	4.00	**37.30**	37.17	37.40	34.670	35.420
M 42	4.50	**40.10**	39.95	40.20	37.129	37.979

* M 2 up to M 2.5 tapping size hole of int. thread 6H

ISO metric fine threads DIN 13

nom. x pitch Ø	tapp. size hole Ø	tapp. size hole Ø		core Ø of int. thread 7H*	
mm	mm	min. mm	max. mm	min. mm	max. mm
M 2.5 x 0.35	**2.35**	2.35	2.38	2.121	2.221
M 3 x 0.35	**2.85**	2.85	2.88	2.621	2.721
M 4 x 0.35	**3.85**	3.85	3.88	3.621	3.721
M 4 x 0.50	**3.80**	3.78	3.83	3.459	3.639
M 5 x 0.50	**4.80**	4.78	4.83	4.459	4.639
M 5.5 x 0.50	**5.30**	5.28	5.33	4.959	5.139
M 6 x 0.75	**5.65**	5.62	5.70	5.188	5.424
M 7 x 0.75	**6.65**	6.62	6.70	6.188	6.424
M 8 x 0.75	**7.65**	7.62	7.70	7.188	7.424
M 8 x 1.00	**7.55**	7.52	7.62	6.917	7.217
M 9 x 0.75	**8.65**	8.62	8.70	8.188	8.424
M 9 x 1.00	**8.55**	8.52	8.62	7.917	8.217
M 10 x 0.75	**9.65**	9.62	9.70	9.188	9.424
M 10 x 1.00	**9.55**	9.52	9.62	8.917	9.217
M 10 x 1.25	**9.40**	9.36	9.47	8.647	8.982
M 11 x 0.75	**10.65**	10.62	10.70	10.188	10.424
M 11 x 1.00	**10.55**	10.52	10.62	9.917	10.217
M 12 x 1.00	**11.55**	11.52	11.62	10.917	11.217
M 12 x 1.25	**11.40**	11.36	11.47	10.647	10.982
M 12 x 1.50	**11.30**	11.26	11.38	10.376	10.751
M 14 x 1.00	**13.55**	13.52	13.62	12.917	13.217
M 14 x 1.25	**13.40**	13.36	13.47	12.647	12.982
M 14 x 1.50	**13.30**	13.26	13.38	12.376	12.751
M 15 x 1.00	**14.55**	14.52	14.62	13.917	14.217
M 15 x 1.50	**14.30**	14.26	14.38	13.376	13.751
M 16 x 1.00	**15.55**	15.52	15.62	14.917	15.217
M 16 x 1.50	**15.30**	15.26	15.38	14.376	14.751
M 17 x 1.00	**16.55**	16.52	16.62	15.917	16.217
M 17 x 1.50	**16.30**	16.26	16.38	15.376	15.751
M 18 x 1.00	**17.55**	17.52	17.62	16.917	17.217
M 18 x 1.50	**17.30**	17.26	17.38	16.376	16.751
M 18 x 2.00	**17.10**	17.05	17.20	15.835	16.310
M 20 x 1.00	**19.55**	19.52	19.62	18.917	19.217
M 20 x 1.50	**19.30**	19.26	19.38	18.376	19.751
M 24 x 1.00	**23.55**	23.52	23.62	22.917	23.217
M 24 x 1.50	**23.30**	23.26	23.38	22.376	22.751
M 24 x 2.00	**23.10**	23.05	23.20	21.835	22.310
M 27 x 1.50	**26.30**	26.26	26.38	25.376	25.751
M 30 x 1.50	**29.30**	29.26	29.38	28.376	28.751
M 33 x 1.50	**32.30**	32.26	32.38	31.376	31.751
M 36 x 1.50	**35.30**	35.26	35.38	34.376	34.751
M 39 x 1.50	**38.30**	38.26	38.38	37.376	37.751
M 42 x 1.50	**41.30**	41.26	41.38	42.376	42.751

* M 2.5 x 0.35 up to M 4 x 0.35 tapping size hole of int. thread 6H

Tapping size hole diameter tolerance zone for thread forming (to DIN 13, section 50)

Due to the tensile strength it is not necessary to adhere to the tapping size hole diameter tolerance class 6H; tolerance class 7H satisfies the requirement that the flank coverage of external and internal threads should not fall below 0.32 x P. In addition, formed threads generally possess a higher tensile strength in comparison to cut threads thanks to an uninterrupted grain flow and subsequent work hardening.

(Whitworth-) pipe thread G DIN EN ISO 228-1

nom. Ø	pitch	tapp. size hole Ø	tapp. size hole Ø		core Ø of int. thread	
inch	per inch	mm	min. mm	max. mm	min. mm	max. mm
G 1/16	28	**7.30**	7.28	7.35	6.561	6.843
G 1/8	28	**9.30**	9.28	9.35	8.566	8.848
G 1/4	19	**12.50**	12.48	12.55	11.445	11.890
G 3/8	19	**16.00**	15.98	16.05	14.950	15.395
G 1/2	14	**20.00**	19.98	20.12	18.631	19.172
G 5/8	14	**22.00**	21.98	22.12	20.587	21.128
G 3/4	14	**25.50**	25.48	25.62	24.117	24.658
G 7/8	14	**29.25**	29.23	29.37	27.877	28.418
G 1	11	**32.00**	31.98	32.15	30.291	30.931
G 1 1/4	11	**40.75**	40.70	40.85	38.952	39.592

TM SP – Thread milling cutter w/o countersink step



- simple and cost-efficient tool for the milling of internal threads
- 2-3 thread sizes with the same pitch can be produced over the specified nominal dimension
- application in materials ≤ 1000 N/mm²
- available with or without internal cooling

Thread types: M, MF, UNC, UNF, G, NPT

TMCP SP – Thread milling cutter with 45° countersinking step



- countersinking and thread milling with only one tool
- very smooth running and low lateral forces
- designed for the application of difficult-to-machine materials also available w/o countersinking step
- 2-3 thread sizes with the same pitch can be produced over the specified nominal dimension
- only available with internal cooling

Thread types: M, MF, G

TMU SP – Universal milling cutter with collar recess



- universal application possibilities
- for various thread sizes with the same pitch, i.e. thread M30x1.5 with milling cutter Ø 12xM1.5, Ø 16xM1.5 or Ø 20xM1.5
- only available with internal cooling

Thread types: M, MF, G, UN, NPT and external thread M, MF, G

MTM 3 SP – Micro-thread milling cutter



- thread size and pitch are predetermined
- excellent characteristics with high-tensile materials such as titanium, stainless steel etc.
- suitable for the machining of hardened steel 45 HRC - 65 HRC
- threads up to 3xD
- available with or without internal cooling

Thread types: M, MF, G, UNC, UNF, MJ, UNJC, UNJF

MTMH3-Z – Helical drill thread milling cutter

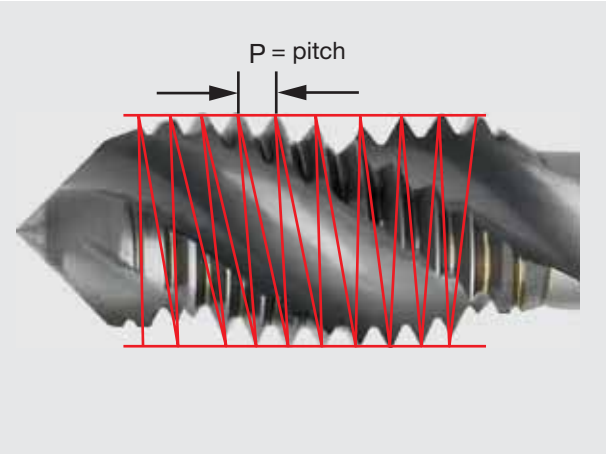


- core holes and threads in one step: significantly shorter cycle and setting time
- universally applicable in unhardened and hardened materials up to 66 HRC
- process reliability guaranteed
- with cooling grooves up to max. 2.5xD

Thread types: M, MF; G; UNC, UNF

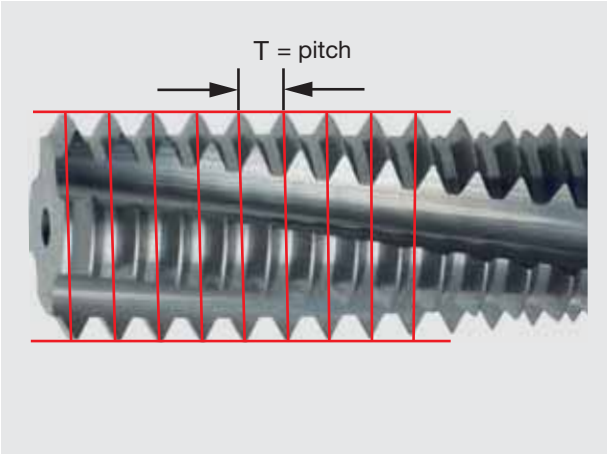
Difference between taps/fluteless taps and thread milling cutters

Taps/fluteless taps



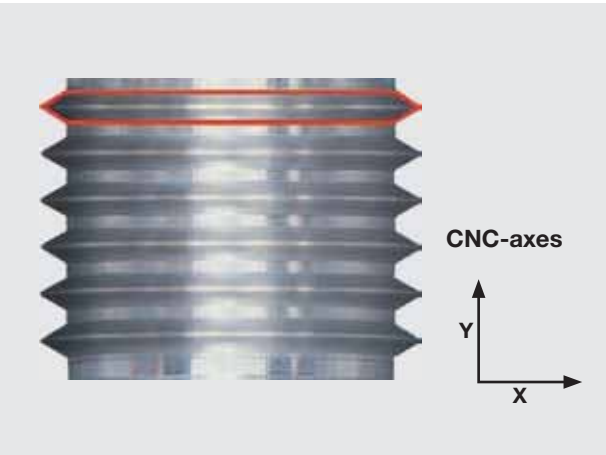
The red lines show the pitch angle of the thread that is ground into the tool. This means the pitch is cut into the workpiece by the tool.

Thread milling cutter

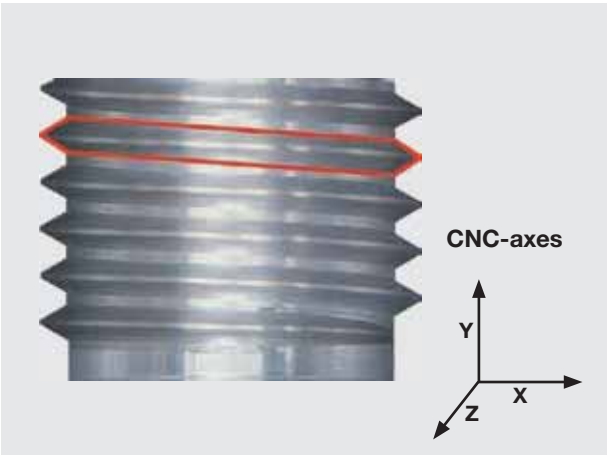


The red lines show that the tool does not possess a pitch angle. The pitch is produced by the Z-axis of a CNC machine.

Creation of the thread with thread milling



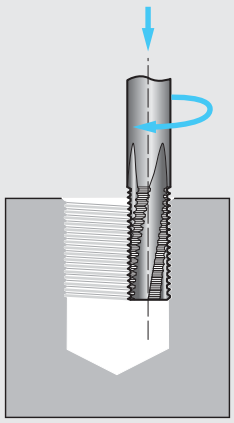
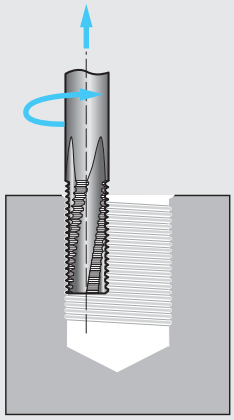
Thread profile without axial feed (Z-axis) of the machine. A groove profile is created without pitch. A functioning thread is not created.



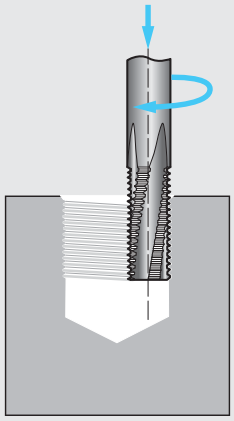
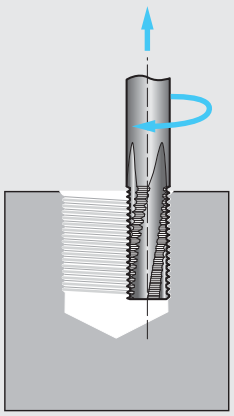
Through the additional programming of the Z-axis the necessary pitch is produced.

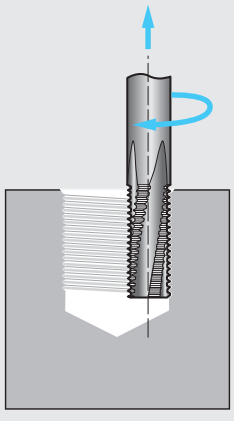
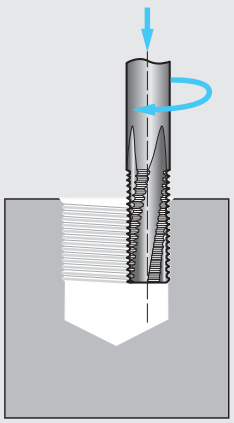
Note:
Due to diagonal milling in the pitch angle **(Z-axis)** the thread profile of the tool is **transferred onto the component distorted.**
The more the milling cutter diameter (80 % of nom. Ø) approaches the nominal thread diameter and the higher the thread pitch the more pronounced the profile distortion is.

Differentiating between two milling processes

Conventional milling	Climb milling
clockwise, with G02	anticlockwise, with G03
	
Conventional milling is preferentially applied for the machining of harder materials or to remedy taper threads.	Climb milling is applied with thread depths smaller than 1.5xD. Advantage: A better surface finish is achieved.

Thread production with one tool

Right-hand thread	Left-hand thread
Conventional milling	Conventional milling
	
Tool rotates clockwise from top to bottom	Tool rotates clockwise from bottom to top

Right-hand thread	Left-hand thread
Climb milling	Climb milling
	
Tool rotates clockwise from bottom to top	Tool rotates clockwise from top to bottom

Thread milling programming

Programming software v 2.0
CNC Gühro ThreadMill

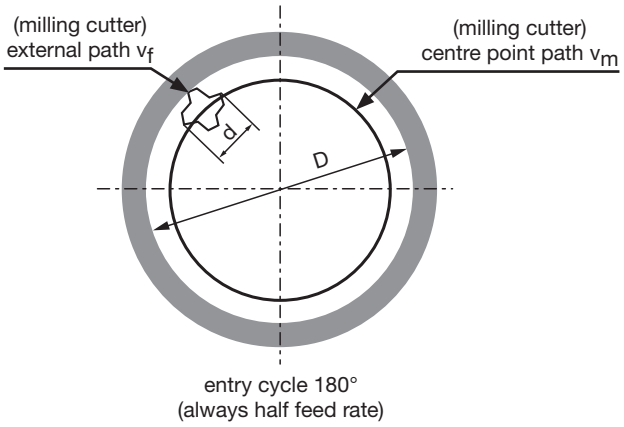
Program specifications

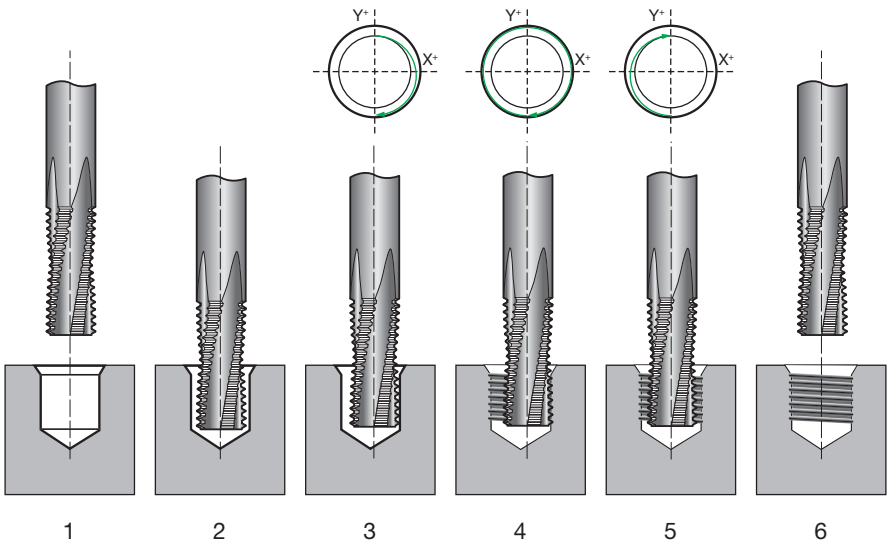
Thread milling functions

G00	Rapid movement	**G90**	Absolute dimension
G01	Feed	**G91**	Incremental dimension
G02	Circular interpolation (clockwise)	**M03**	Spindle on (clockwise rotation)
G03	Circular interpolation (anti-clockwise)	**M05**	Spindle stop
G17	Layer selection x-y axis	**M08**	Coolant on
G18	Layer selection z-x axis	**X**	Axis
G19	Layer selection y-z axis	**Y**	Axis
G40	Cancel tool correction	**Z**	Axis
G41	Tool path correction (left of contour)	**I**	Thread pitch parallel to X-axis
G42	Tool path correction (right of contour)	**J**	Thread pitch parallel to Y-axis
G43	Tool length compensation (call-up)	**S**	Spindle speed
G49	Tool length compensation (deselect)	**F**	Feed
G54	Work offset		

CNC internal thread milling

1. Moving to start position
2. Moving to thread depth in bore
3. 180° descending loop to contour
4. 360° full circular movement of thread milling cutter
5. 180° exit loop to centre of bore
6. Rapid movement from bore to start position





Formula of calculation

$$v_c = \frac{d \cdot \pi \cdot n}{1000}$$

$$n = \frac{v_c \cdot 1000}{d \cdot \pi}$$

$$v_f = n \cdot z \cdot f_z$$

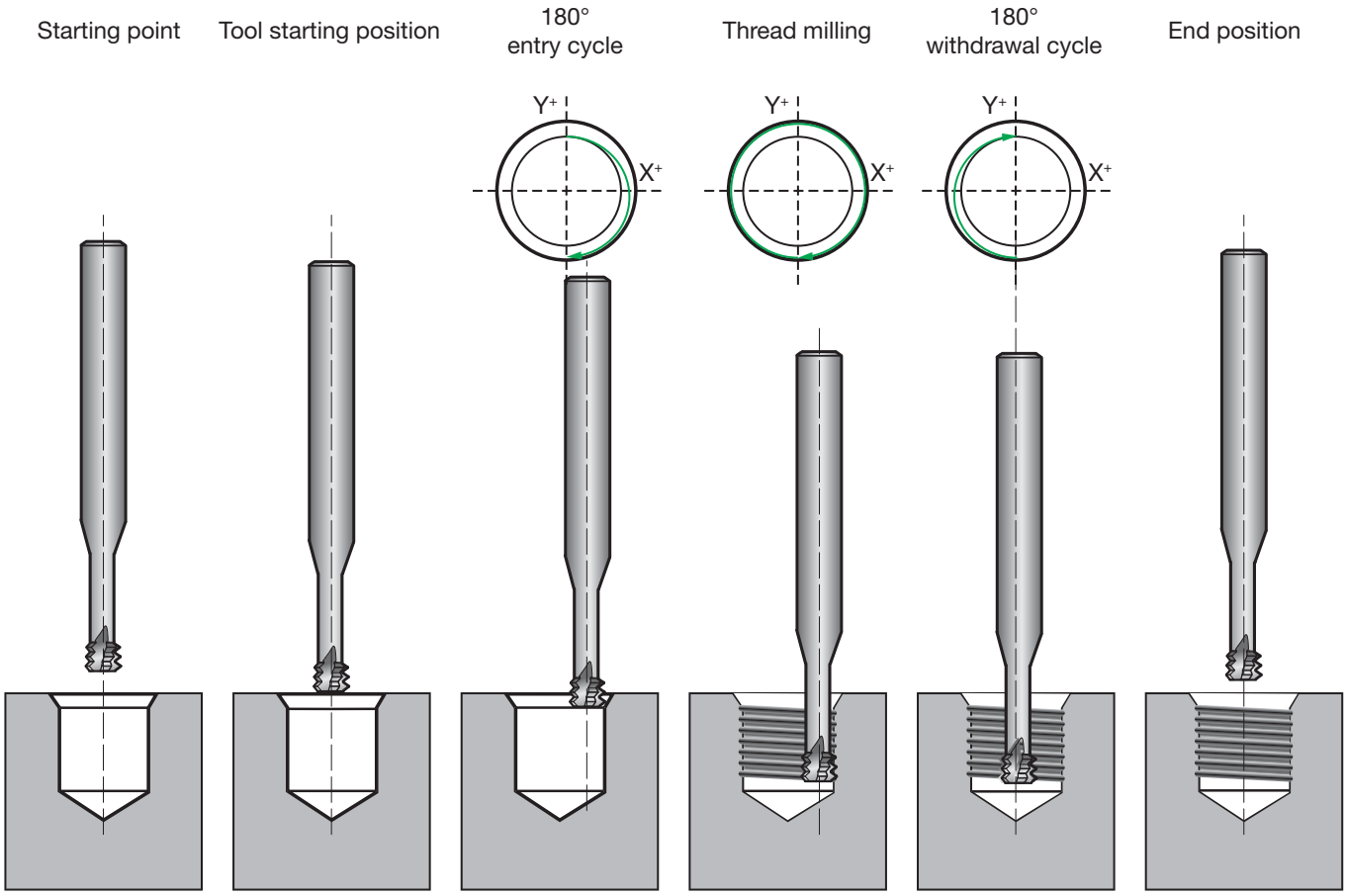
$$v_m = \frac{v_f \cdot (D - d)}{D}$$

$$v_b = n \cdot f_b$$

v_c = cutting speed
v_f = contour feed
v_m = centre point path feed
n = revolutions
z = number of teeth
f_z = feed per tooth
f_b = feed per drill per revolution*
v_b = drill feed rate*
D = Ø nom. of thread [mm]
d = milling cutter nom. Ø [mm]
* for drill/thread milling

Thread milling programming

Programming process for micro-thread milling (right-hand thread in reverse rotation)



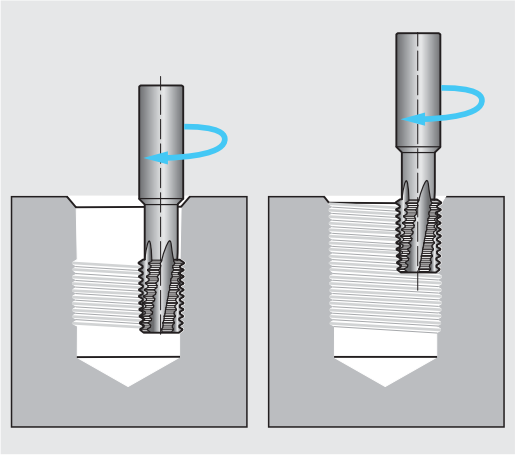
Possibilities to reduce radial forces

To reduce radial forces cut distribution can be undertaken:

Advantage:
- for larger thread depths
- counteracts taper threads
- for unstable clamping conditions

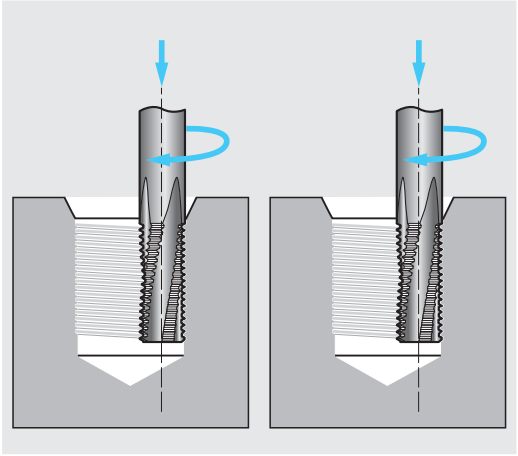
Disadvantage:
- increased tool wear
- longer production time

Axial distribution of cut



1st step 2nd step

Radial distribution of cut



1st step 2nd step



1st step conventional milling

2nd step conventional milling

Correct tool clamping also plays a essential role with thread milling. Thread milling cutters should as a rule be clamped as short as possible. A compact and mechanical clamping force is preferable. The error in concentricity should not exceed 0.02 millimetres.

Power chucks



A power chuck excels thanks to extremely accurate concentricity. The high clamping forces and optimal smooth running are a perfect prerequisite for the production of threads in all materials including a high pitch.

max. permissible error in concentricity: 0.003 mm

Side lock holders



A side lock holder for HB and HE shanks is a robust, cost-efficient clamping chuck with a maximum clamping force. The clamping surface prevents the tool twisting or being pulled out during machining. Therefore, side lock holders are suitable for the production in all materials including a high pitch.

max. permissible error in concentricity: 0.002 mm

Shrink fit chucks



A shrink fit chuck creates a rigid connection with the shrink fitted tool. Incorrect shrink fitting or older shrink fit chucks can result in the pulling out of the tool. Tool breakage and possible loss of the component would be the consequence. Therefore, the shrink fit chuck is only suitable for a thread pitch < P=1.5 mm.

max. permissible error in concentricity: 0.005 mm

Hydraulic chucks



A hydraulic chuck, similar to the shrink fit chuck, has only limited suitability for thread milling. Especially with high radial forces this clamping chuck reaches its limits. Therefore, the hydraulic chuck is recommended for softer materials such as aluminium and a thread pitch < P=1.5 mm.

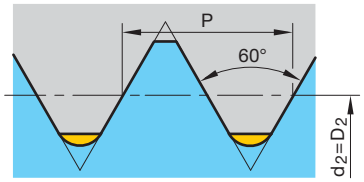
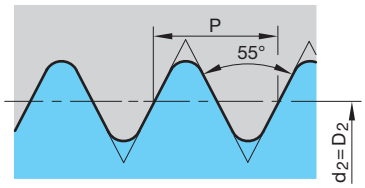
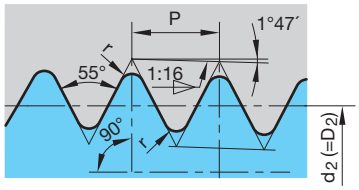
max. permissible error in concentricity: 0.005 mm

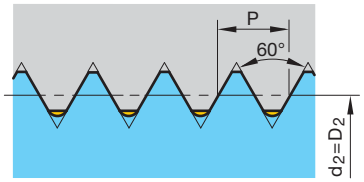
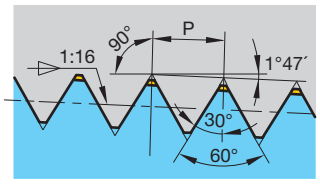
Collet holders



Collet chucks are very well suited for micro-thread milling because only axial stresses are created. The low clamping forces omly permit the milling of softer materials. Consequently, collet holders are not suitable for conventional thread milling.

max. permissible error in concentricity: 0.01 mm

Geometry drawing	Standard	Application
M ISO-metric thread		
	DIN 13-1	General standard thread
G Cylindrical Pipe Thread without thread sealing connections		
	DIN EN ISO 228-1	Threads for pipes, pipe connections and fittings
Rc Whitworth pipe thread tapered internal thread		
	DIN ISO 10226-2 (hardly used in Europe, replaceable with pipe threads to ISO 7-1)	Internal thread for pipe threads and fittings (for in the thread sealing connections)

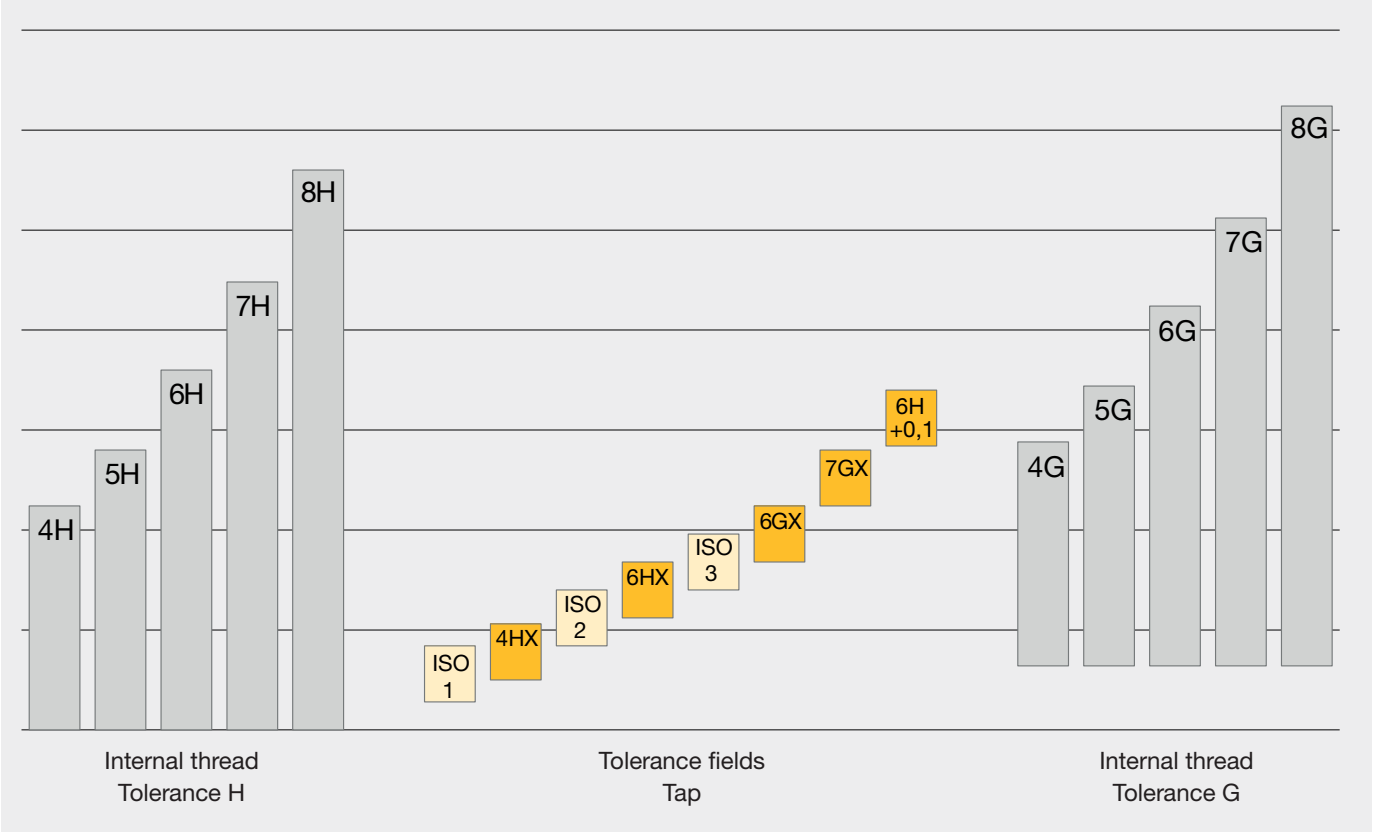
Geometry drawing	Standard	Application
MF ISO-metric fine thread		
	DIN 13-2 to DIN 13-11	General fine thread
NPT American Standard Pipe Threads tapered for sealing		
	ANSI/ ASME B1.20.1	Pipe threads and fittings

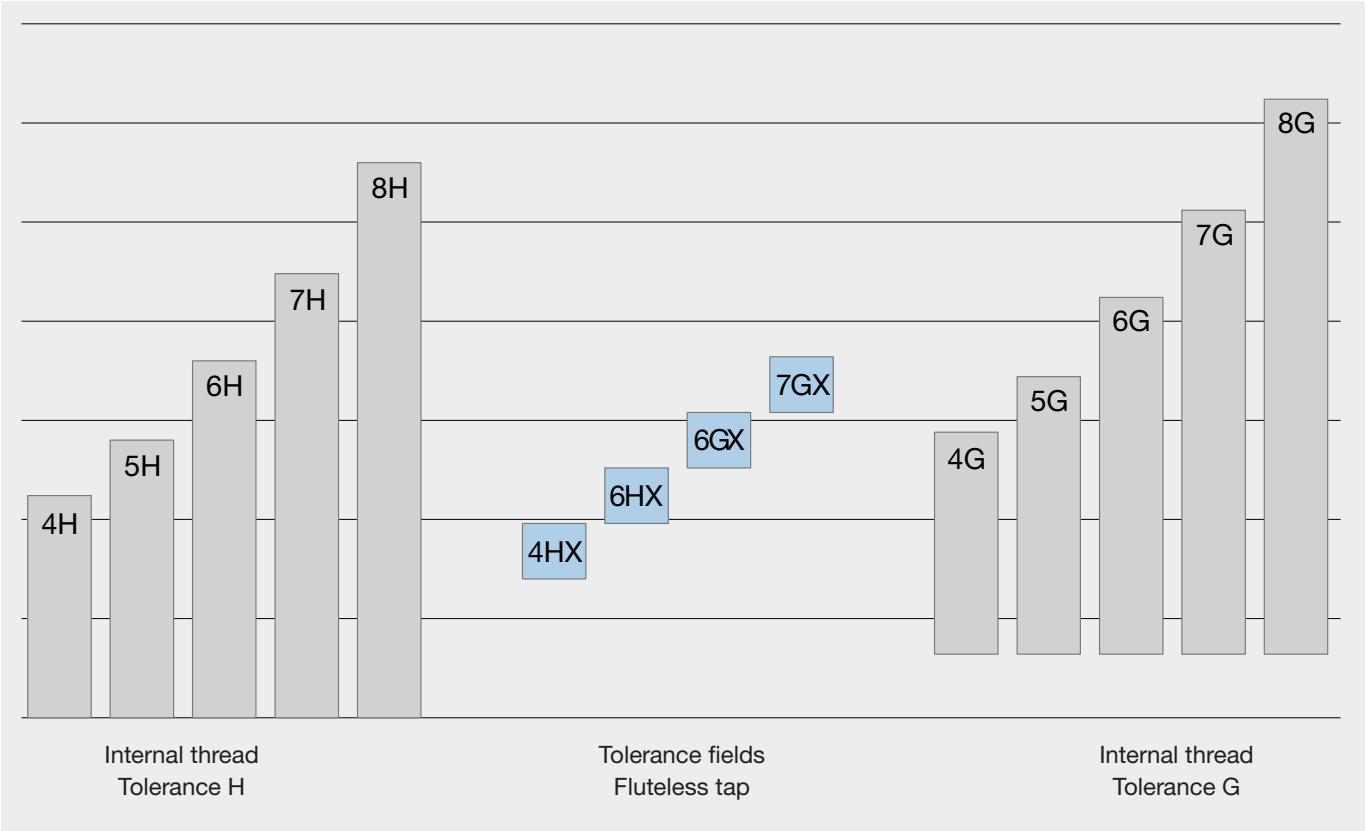
external thread

internal thread

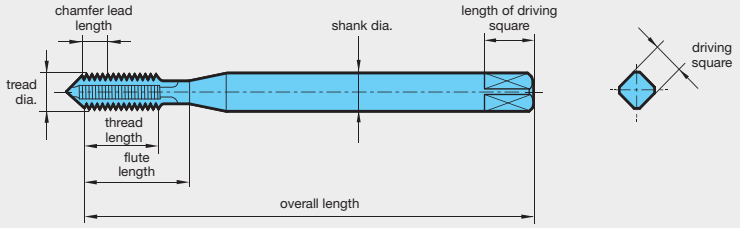
play

Tolerance fields to DIN EN 22857

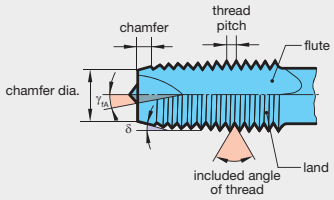


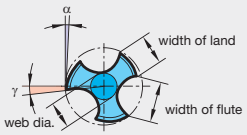


Definitions and angles, centres and flute forms



δ = try square
γ_{fA} = spiral point angle
α = clearance angle
γ = rake angle





Flute forms

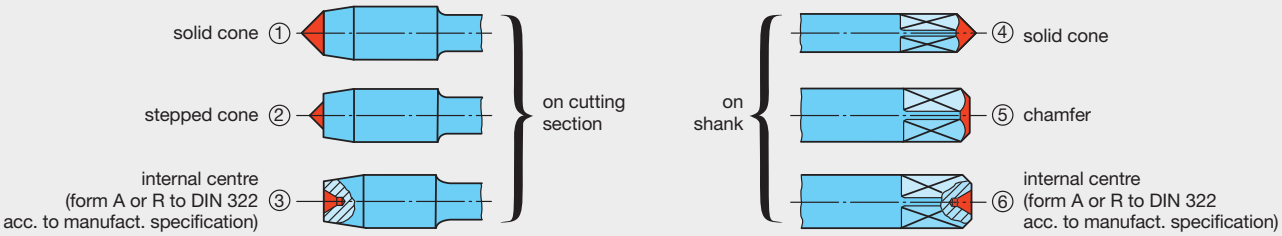

straight fluted, form C **without spiral point**


straight fluted, form B **with spiral point**


helix angle **15°**


helix angle **40°**

Types of centres (standard, to DIN 2197/DIN 2175)



Thread dia. range mm	Centre on cutting section		Centre on shank
	with chamfer forms A, C, D, E	with chamfer form B	
≤ 4.2	①	①	④⑤⑥
> 4.2 … 5.6	①②	①	④⑤⑥
> 5.6 … 10.0	①②③	①②③	④⑤⑥
> 10.0	③	③	⑥

Coolant duct geometries


axial coolant delivery with axial coolant duct exit


axial coolant delivery with radial coolant duct exit in the flutes at the chamfer

Chamfer forms, selection and application

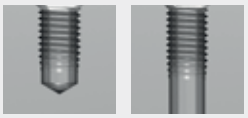
When cutting internal threads, all the machining is carried out by the cutting teeth of the chamfer. Therefore, a decision on the best type of chamfer form has to be carefully made as both tool life and quality of thread are thereby greatly affected.

Generally speaking, the form and length of chamfer depend on the type of hole to be tapped. The tapping of through holes does not normally give rise to any difficulties whereas the production of blind holes can create certain problems associated with the need to evacuate swarf in the reverse direction to the feed, i.e. up to the flutes of the tap and then cut off such swarf when the tap is reversed out of the hole.

The length of chamfer is determined by taking into account various conflicting factors. To avoid overloading, premature bluntness and oversize threads the number of chamfer cutting threads must not be kept too low. A too long chamfer lead, however, increases the torque and thus the danger of breakage. The spiral point with form B ensures a chip removal always in the direction of feed.



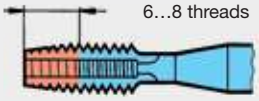
through hole



blind hole

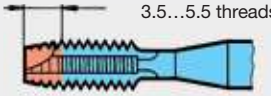
Chamfer forms to DIN 2197

Form A



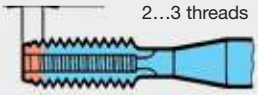
long, 6 - 8 threads
for short
through holes

Form B



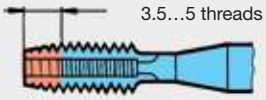
medium, 3.5 - 5.5 threads,
with spiral point,
for all through holes
and deep tapping holes in medium
and long-chipping materials

Form C



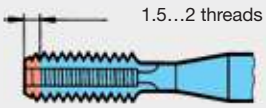
short, 2 - 3 threads
for blind holes
and generally for
aluminium, grey cast iron
and brass

Form D



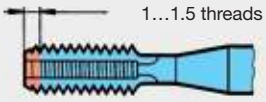
medium, 3.5 - 5 threads
for short
through holes

Form E



extremely short, 1.5-2 threads,
for blind holes with
extremely short thread runout.

Form F

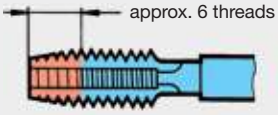


extremely short, 1-1.5 threads,
for blind holes with
extremely short thread runout.
Avoid use if possible.

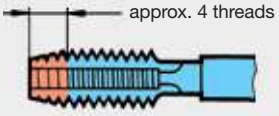
Chamfer forms, selection and application

Chamfer lead length for sets of 3 taps

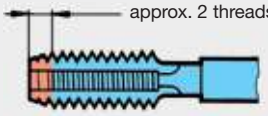
Form A
first tap



Form D
second tap

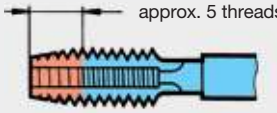


Form C
bottoming tap

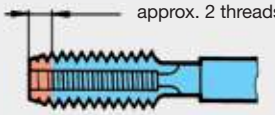


Chamfer lead length for sets of 2 taps

Form D
first tap



Form C
bottoming tap



Application recommendations

While in the first instance, the type of tapped hole required determines the chamfer, generally the tap geometry - i.e. form, number and direction of flutes, cutting angle, etc. - depend on the material to be machined and on the application. Basically, taps up to M16 for tapping ISO metric threads or for the engineering industry in general, have 3 flutes, and above this size 4 or more flutes.

Taps with left-hand flutes and taps with spiral points remove the chips in the cutting direction or direction of feed and are therefore especially suitable for tapping through holes. Taps with straight flutes and long chamfer lead (form D) also give good results.

As far as blind holes are concerned we recommend taps with right-hand spiral flutes or straight fluted taps with a short chamfer lead length. Tools with right-hand spiral flutes have the chip flow in the backward direction, i.e. up the flutes. The chamfer lead length is designed in such a way so that during the return movement chips do not jam and are reliably sheared off.

The tapping of aluminium, grey cast iron and brass requires taps with a short chamfer lead length, regardless of whether through or blind holes are required. In these materials a long chamfer lead length would act as a core drill with chip breaker grooves and would only drill the tapping size hole to the major diameter instead of cutting a thread.

Straight fluted taps without spiral point are general purpose tools and have the disadvantage of not showing optimum results in particular materials. It's well worth the effort to take the trouble of ascertaining the most suitable tool for any given metal-cutting task.



Through hole



Straight fluted tap with spiral point



Left-hand spiral fluted tap



Straight fluted tap with long chamfer lead



Blind hole



Right-hand spiral fluted tap



Straight fluted tap with short chamfer lead

Thread production by pressure deformation

Fluteless taps are used for the forming of internal threads without chip removal. In contrast to conventional tapping where material is cut from the workpiece, thread forming is a pressure deformation process without chip removal for the production of internal threads. During the process the material is cold formed without interrupting the grain flow.

According to DIN 8583, thread forming is described as “pressing the thread into the workpiece with a tool possessing a spiral working area”. The spiral threaded, polygonal portion of the fluteless tap is “screwed” into the pre-drilled workpiece with an appropriate constant feed rate equal to the thread pitch. Hereby the thread profile is pressed gradually via the forming lead into the material of the workpiece so to speak. Subsequently, the pressure in the deformation zone exceeds the compression limit, the workpiece becomes ductile and is deformed. The material yields radially, “flows” along the thread profile in the unoccupied base of the tool and forms the minor diameter of the internal thread. The flow process creates the process specific form pockets (claws).

The tapping size hole diameter is heavily dependent on the formability of the material, the workpiece geometry and the required effective depth of the thread. In comparison to conventional tapping, a larger diameter tapping size hole should be selected. With a larger diameter tapping size hole the load on the tool is reduced whilst increasing the tool life. Thanks to the uninterrupted grain flow, the loading capacity of the thread remains sufficient with a 50 % effective thread depth.

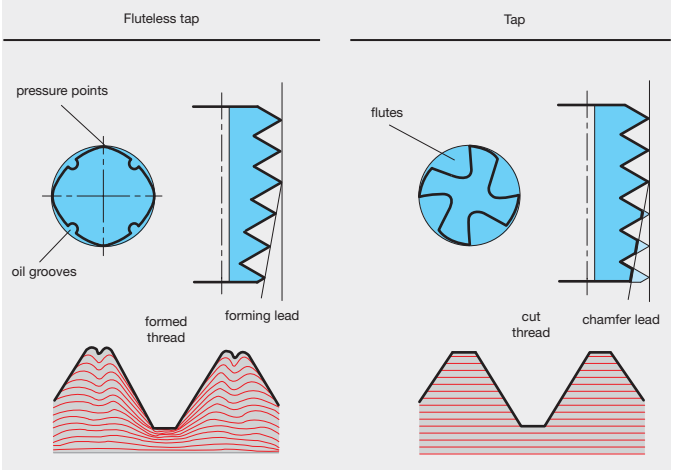
The partially formed crests of the thread with decreasing effective thread depth are a typical characteristic of threads produced by the thread forming process. With the flanks of the thread fully formed, they have no influence on the tensile strength of the thread. If necessary, the required deformation level of the thread should be determinded by performing a test.

Lubrication is of significant importance. The lubrication prevents material from building up on the thread flanks and ensures that the necessary torque for the forming process is not too high. Therefore, under no circumstances should there ever be a break-down in lubrication! Preference should be given to lubricants such as cooling agents of oils containing graphite such as those used in rolling processes. Always follow the rule: “The better the lubrication the easier the thread forming process!”

It offers the following advantages

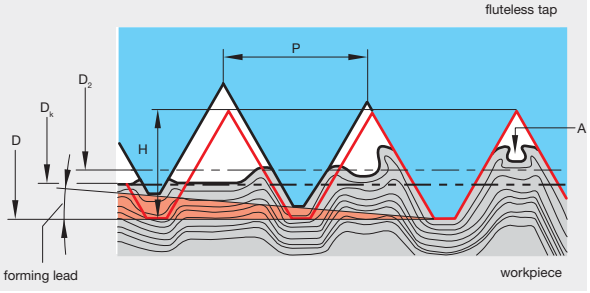
- no chip formation.
- one tool for the production of threads in through and blind holes.
- application in wide range of materials.
- no cutting errors.
- pitch and angle of thread errors that can occur with thread cutting are eliminated.
- internal threads produced by thread forming possess a higher tensile strength particularly at the thread flanks thanks to the so-called “uninterrupted grain flow” and the cold forming process.
- the surface of the thread is improved.
- fluteless taps can be applied at higher speeds because the formability of many materials increases with the forming speed. This does not have a negative effect on the tool life.
- reduced danger of breakage through rigid design

Process
The production of internal threads without chip removal (thread forming) in comparison to conventional tapping



Flow characteristics of the material during thread forming and the deformation process

D = nominal Ø
D2 = flank Ø
Dk = hole Ø
H = profile height
P = thread pitch
A = form pocket (claw)
– finished Internal thread



“Profile“ – Gühring’s new fluteless tap generation Characteristics and advantages

Conventional fluteless taps, produced by a grinding process only, show traces of microscopic, very fine grinding marks on the surface of the tool. This also applies to the threaded portion of the tool required to perform the thread forming operation.

This surface topography (structure) has a negative effect on the friction between the tool and the material to be re-formed as well as on the herewith associated heat development, on the necessary torque and last but not least on the wear of the pressure points of the fluteless tap. In addition, the “grinding marks” encourage the build-up of the material to be reformed in the thread flanks of the fluteless tap. This is also called cold welding.

Thanks to a special process to improve the surface topography (structure), Gühring’s new Profile fluteless taps no longer possess these “grinding marks”. This has been confirmed in research and tool life studies in varying materials under production conditions.

For the user, a longer tool life and increased cutting speeds are the benefits of this special process. The tool life can be increased considerably depending on the material to be machined and the application condi-tions. A 100 % increase in tool life is not unusual.

The improved surface topography is not only of benefit to tools with bright finish. Particularly coated tools also benefit from the new process. Outer contour and forming lead greatly determine the performance of the fluteless tap. Numerous tests have shown that fluteless taps with optimal pressure point geometry and quantity achieve increased tool life and dimensional accuracy.

Further improvements in quality are achieved when the fluteless tap is produced completely in one setting and with one grinding wheel - set-up with a special roll. Pitch errors between the thread crests and former lead transition area do not occur as with the conventional grinding process.

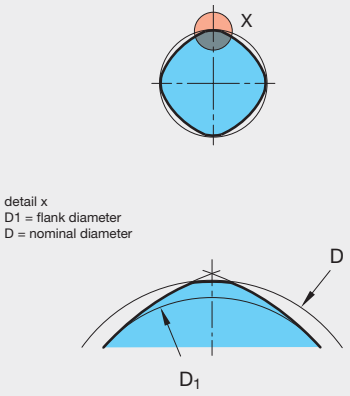


Tooth of a conventional fluteless tap

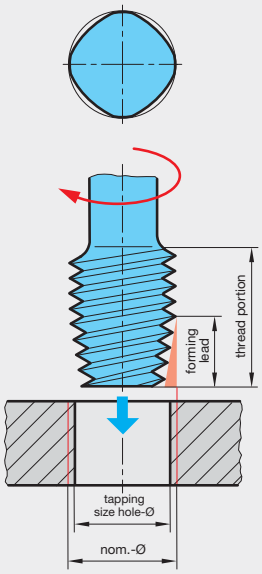


Optimised surface of a Gühring profile fluteless tap

Cross section of fluteless tap

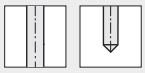


Operating principle



Types of tapping size hole

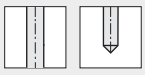
with fluteless taps without oil grooves for thread depth ≤ 1xD



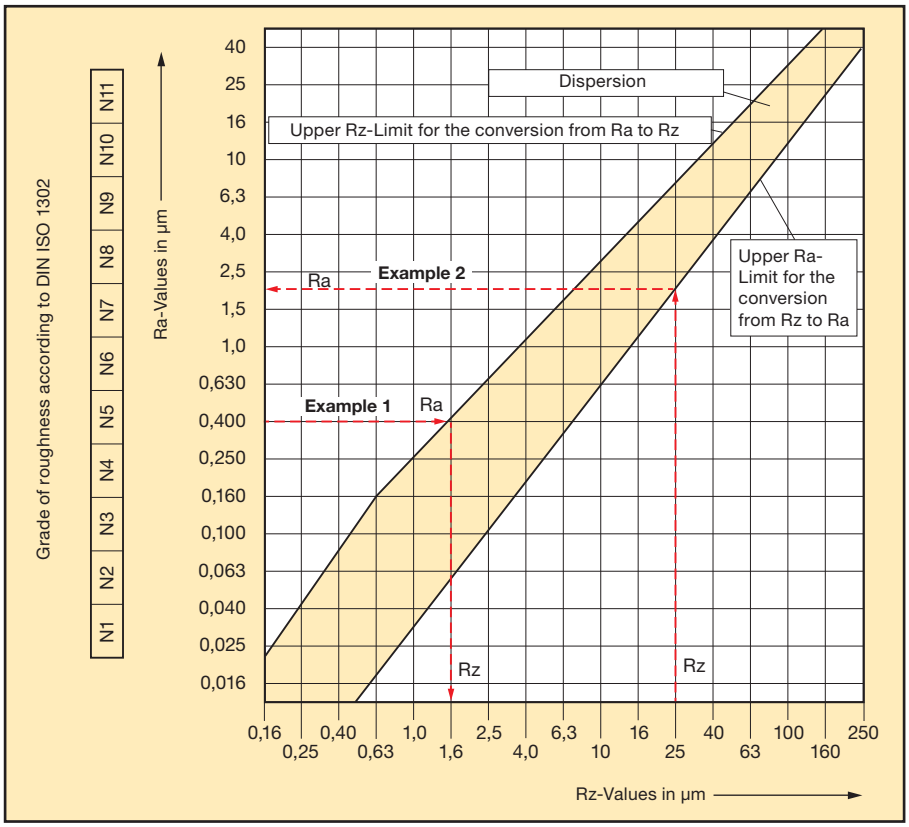
for thread depth ≥ 1xD



Fluteless tap with oil grooves for all thread depths



Conversion ratio to DIN 47



Example 1: R_a in R_z

When comparing the average roughness index R_a = 0.4 µm to the average roughness R_z we achieve a value of R_z = 1.6 µm.

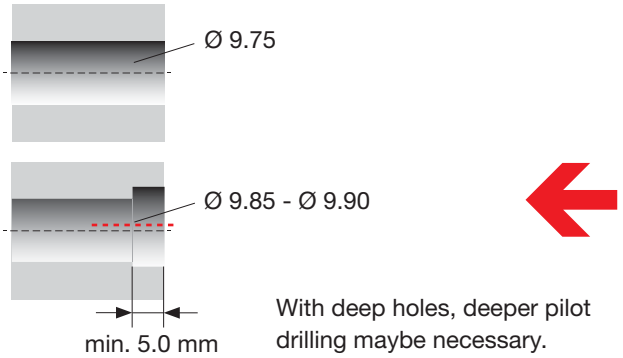
Example 2: R_z in R_a

When comparing the average roughness R_z = 25 µm to the average roughness index R_a we achieve a value of R_a = 2 µm.

Optimal diameters of pre-drilled holes

Recommended stock allowance, in mm			up to Ø6	up to Ø10	up to Ø16	up to Ø25	up to Ø40	above Ø40
all materials			Ø 0.1-0.2	Ø 0.2	Ø 0.2-0.3	Ø 0.3	Ø 0.3-0.4	Ø 0.4-0.5
hardened steel	H	up to 48 HRC	Ø 0.1-0.2	Ø 0.2	Ø 0.2	Ø 0.2	Ø 0.3	Ø 0.3
		up to 63 HRC	Ø 0.1	Ø 0.1	Ø 0.1-0.2	Ø 0.2	Ø 0.2	Ø 0.2

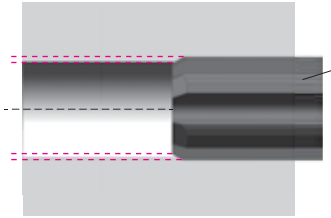
Example: Correcting off-set



With deep holes, deeper pilot drilling maybe necessary.



Off-set of pilot hole to reamer position
Correction with milling cutter or Hollfelder fine machining tool.



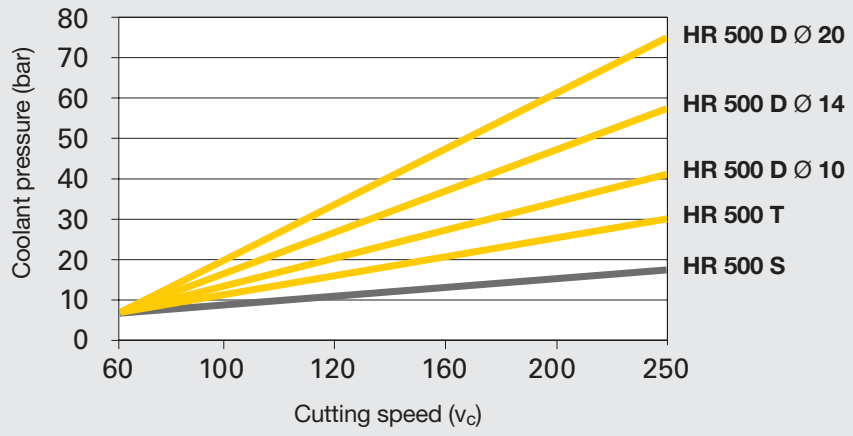
The reamer follows the pilot setting and corrects the positioning error.

Achievable surface quality for reaming operations

	Roughness classes	N11	N10	N9	N8		N7	N6		N5	N4	N3	N2	N1
	Average roughness R_a	25	12.5	6.3	3.2		1.6	0.8		0.4	0.2	0.1	0.05	0.025
	Average peak-to-valley height R_z	100	63	40	25	16	10	6.3	4	2.5	1.6	1	0.63	0.25
P	Struct. steel, low-alloyed steels: Case-hard. and heat-treat. steels													
M	Stainless steels Heat-resistant steels													
K	Grey cast iron, ferritic													
	Grey cast iron, pearlitic													
	Spheroidal graphite iron, ferritic													
	Spheroidal graphite iron, pearlitic													
N	Copper-alloy, brass													
	Aluminium wrought alloy													
	Aluminium cast alloy: Si-content < 10 %													
	Aluminium cast alloy: Si-content > 10 %													
S	Special alloy: Inconel													
	Titanium, titanium alloys													
H	Hardened steel < 45 HRC													
	Hardened steel > 45 HRC, ≤ 63 HRC													

achievable limited achievability

Optimal cooling lubricant supply to HR 500



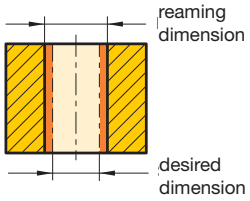
For an optimal cooling lubricant supply to HR 500 type D reamer cutting edges for through holes we recommend clamping in hydraulic or shrink fit chucks to the maximum clamping depth.

Adapted cutting speed, an appropriate feed rate and good cooling and lubricating agents should always be a top priority for reaming operations. A further point to be considered is that the reamer always follows the direction of the pre-drilled hole. An exception is the machine bottoming reamer or a very small reamer. Consequently reamers do not correct alignment errors of pre-drilled holes. Errors between the spindle axis and the axis of a pre-drilled hole can be adjusted with the aid of floating holders. The following fault finding chart will be found useful in tracing the cause of some common reaming problems.

Wording:

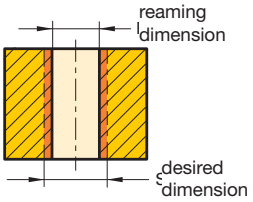
Desired dim.	Required finish dimension of bore hole, defined as max./min. dimension of tolerance zone
Reaming dim.	the finish dimension reached in fact
„*Bore hole*“	The reached bore hole after reaming

❶ Holes too large



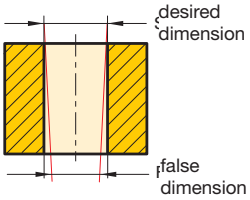
- Tool diameter too large
- Cutting speed too high
- Concentricity error of machine spindle
- Bevel lead of tool too short/uneven
- Cutting edge build up due to wrong cutting speeds oder schlechte Schmierung
- Lubricating agent unsuitable, holes too large due to lubrication

❷ Holes too small



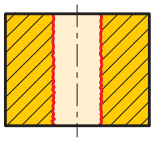
- Reamer blunt. Does not cut, scrapes
- Cutting speed too low
- Component is thin-walled, springs back
- Insufficient stock removal allowance, tool seizes in hole
- Hole is not round due to distortion

❸ Conical hole malformation



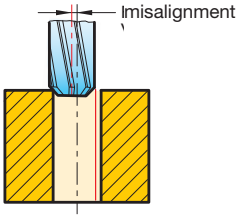
- Tool knocks in spindle
- Bevel lead incorrect
- Axis shifting between tool and pre-drilled hole. Application of floating holders
- Pre-machining inaccurate

❹ Unsatisfactory surface finish



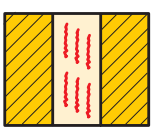
- Cutting speed too low
- No/insufficient lubrication. Cutting edge build-up.
- Tool damaged, i. e. broken cutting edge
- Material has a tendancy to cause build up on cutting edges.
- Concentricity bevel lead incorrect
- Chip evacuation restricted

❺ Misalignment of hole



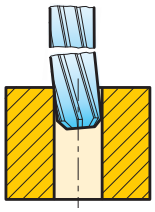
- Pre-drilled hole misaligned
- Concentricity bevel lead incorrect
- Apply floating holder if necessary
- If necessary pilot drill to correct pre-drilled position

❻ Hole has chatter marks



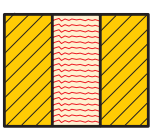
- Feed too low
- Cutting edge build-up
- Grease content in coolant too low
- Circular lands too small
- Stock removal allowance insufficient
- Tool incorrectly clamped in tool holder
- Machine spindle not concentric

❼ Reamer seizes and breaks



- Position to pilot hole incorrect
- Back taper incorrect
- Circular lands too wide
- Pre-drilled hole is too small
- Bevel lead blunt/ground unevenly
- Feed rate too high
- Chip congestion – increase feed rate to produce shorter chips

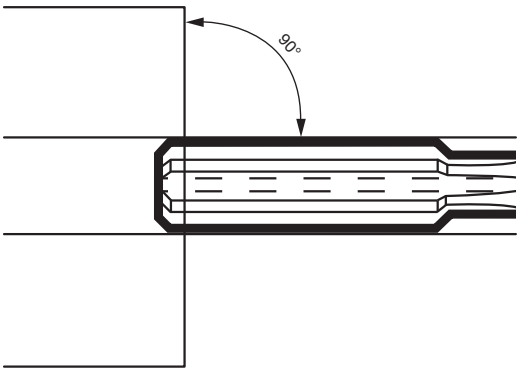
❽ Feed scoring marks in hole



- Cutting speed too low
- Worn cutting edges
- Crumbling on cutting edges
- Build up on cutting edges
- Position to pilot hole incorrect
- Insufficient lubrication

Working with the HR 500 L and HR 500 XL reamers

Reamers can only be used if the hole entry is vertical without any interruptions:



The HR 500 L and HR 500 XL may only be used with a pilot hole.

The pilot hole should be at least 5 mm deep.

The pilot hole diameter should be 0.005 to 0.010 mm larger than the diameter of the reamer.

The pilot hole can be produced by turning, milling or with a pilot reamer.

The reamer is easier to insert if the pilot hole is countersunk.

The quality of the reaming is determined by the pre-machining. For better position accuracy, the pilot hole should be created by milling or turning with the shortest possible tool.

Drill the pilot hole (according to the previous page)

Approach with reduced rapid traverse.

Drill into the pilot hole:
n = 500 rpm anti-clockwise (M04)
v_f = 300 mm/min

The cooling medium is activated 0.5 mm before the bottom of the pilot hole.
The reamer's rotation direction is changed to clockwise (M03) and increased to the working speed.
The working feed rate is activated.

After reaching full reaming depth, pull out at n = 500 rpm and double the working feed rate.

Selection of carbide grades with specified strip thickness and tensile strength in the cutting and punching area

Tensile strength of the material	**Strip thickness** of the material			
	< 0.2	0.2 - 0.5	0.5 - 0.8	0.8 - 1.2
< 500	GC070S	GC070S	GC100S	GC100S
	GC100S	GC100S	GC060F	GC110MC
	GC060F	GC060F		
500 - 900	GC070S	GC070S	GC100S	GC110MC
	GC100S	GC100S	GC060F	
	GC060F	GC060F		
900 - 1400	GC100S	GC100S	GC100S	GC110MC
	GC060F	GC060F	GC110MC	
1400 - 2000	GC100S	GC110MC	GC150MC	GC200MC
	GC110MC	GC150MC	GC200MC	GC150EC
> 2000	GC150MC	GC200MC	GC200MC	
	GC200MC	GC150EC	GC150EC	
	GC150EC			

Grades with a C at the end are corrosion resistant.

Grade	Classification	Medium grain size [µm]	Medium grain size	Hardness
GC150EC	G30	8.00	extra coarse	1050
GC110MC	G20	2.50	medium	1310
GC150MC	G30	2.50	medium	1170
GC200MC	G40	2.50	medium	1020
GC060F	K15-K20	1.20	fine	1620
GC070S	K10	0.70	finest	1850
GC100S	K30-K40	0.60	finest	1620

1.2 - 1.5	1.5 - 2.0	2.0 - 3.0	3.0 - 6.0	6.0 - 10.0	> 10.0
GC110MC	GC110MC	GC110MC	GC110MC	GC150MC	GC200MC
			GC150MC	GC200MC	GC150EC
			GC200MC	GC150EC	
GC110MC	GC110MC	GC110MC	GC150MC	GC200MC	GC200MC
	GC150MC	GC150MC	GC200MC	GC150EC	GC150EC
	GC200MC	GC200MC	GC150EC		
GC110MC	GC150MC	GC150MC	GC200MC	GC200MC	
GC150MC	GC200MC	GC200MC	GC150EC	GC150EC	
GC200MC	GC150EC	GC150EC			
GC200MC	GC200MC				
GC150EC	GC150EC				

Bending strength [N/mm^2]	Density [g/cm^3]	WC incl. doping [%]	Co [%]	Fracture toughness K_{IC} [MPa*m$^{1/2}$]
2800	14.00	850	15.0	*
2900	14.40	89.0	11.0	14.5
3000	14.00	85.0	15.0	*
3100	13.55	80.0	20.0	*
3200	14.95	94.0	6.0	9.9
3500	14.70	93.0	7.0	9.6
4100	14.45	90.0	10.0	10.6



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Article no.	Page	Drilling depth	Standard	Description	Tool material	Type	Form
242	281	>25xD	Company std.	Extra length twist drills	HSS	GT 100	
243	282	>25xD	Company std.	Extra length twist drills	HSS	GT 100	
244	283	>25xD	Company std.	Extra length twist drills	HSS	GT 100	
336	274	~10xD	DIN 340	Long series twist drills	HSCO	GT 100	
390	286	~10xD	Company std.	Twist drills with coolant ducts	HSS	N	
393	357	3xD	DIN 371/DIN 376	Taps for ISO metric threads	HSS-E	VA R45	C
394	364	3xD	DIN 374	Taps for ISO metric fine threads	HSS-E	VA R45	C
395	366	3xD	DIN 5156	Taps for BSP threads	HSS-E	VA R45	C
396	276	~10xD	DIN 340	Long series twist drills	HSCO	GT 100	
405	410		DIN 208	Machine reamers	HSS-E		B
413	412		DIN 206	Hand reamers	HSS		B
495	129		Company std.	Front/back deburrer 90°	Solid carbide	EW 100 VR	
515	267	~3xD	DIN 1897	Stub drills	HSS-E-PM	GT 500 DZ	
571	280	~25xD	DIN 1869	Extra length twist drills, series 3	HSCO	GT 100	
618	278	~15xD	DIN 1869	Extra length twist drills, series 1	HSCO	GT 100	
619	279	~20xD	DIN 1869	Extra length twist drills, series 2	HSCO	GT 100	
620	284	~15xD	DIN 1870	Extra length twist drills, series 1	HSCO	GT 100	
621	285	~20xD	DIN 1870	Extra length twist drills, series 2	HSCO	GT 100	
622	269	~5xD	DIN 338	Jobber drills	HSCO	GT 100	
1088	374	1.5xD	Company std.	Taps for NPT threads	HSS-E	N	C
1131	287	~5xD	Company std.	Twist drills with coolant ducts	HSCO	GT 80 IK	
1132	288	~5xD	Company std.	Twist drills with coolant ducts	HSCO	GT 80 IK	
1161	352	3xD	~DIN 371	Taps for ISO metric fine threads	Solid carbide	H	D
1201	354	1.5xD	DIN 371	Taps for ISO metric threads	HSS-E-PM	H	D
1411	406		~DIN 8094	Machine reamers	Carbide		B
1548	394		Company std.	High-performance reamers	Solid carbide	HR 500 TS	
1549	395		Company std.	High-performance reamers	Solid carbide	HR 500 TD	
1577	370	1.5xD	DIN 371	Taps for ISO metric threads	HSS-E-PM	H R15	C
1578	371	1.5xD	DIN 376	Taps for ISO metric threads	HSS-E-PM	H R15	C
1612	54, 264		Company std.	Torx screwdrivers			
1675	390		Company std.	High-performance reamers	Solid carbide	HR 500 S	
1676	392		Company std.	High-performance reamers	Solid carbide	HR 500 D	
1680	396		Company std.	High-performance reamers	Carbide	HR 500 G S	
1681	397		Company std.	High-performance reamers	Carbide	HR 500 G D	
1685	388		Company std.	High-performance reamers	Solid carbide	HR 500 S	
1686	389		Company std.	High-performance reamers	Solid carbide	HR 500 D	
1691	53		Company std.	Clamping screws for die sinking cutter holders			
1914	372	3xD	DIN 371	Taps for ISO metric threads	HSS-E	H	B
1915	373	3xD	DIN 376	Taps for ISO metric threads	HSS-E	H	B
1916	368	3xD	DIN 371	Taps for ISO metric threads	HSS-E	H R40	C
1917	369	3xD	DIN 376	Taps for ISO metric threads	HSS-E	H R40	C
1941	50		Company std.	Die sinking cutter holders GF 200 WP		GF 200	
1942	51		Company std.	Die sinking cutter holders GF 200 WP		GF 200	
1946	204	3xD	DIN 6537K	Twist drills with reinforced straight shank	Solid carbide	H	
1947	52		Company std.	Indexable inserts round	Cermet	GF 200	
2459	272	~5xD	DIN 338	Jobber drills	HSCO	GT 100	
2520	52		Company std.	Indexable inserts round	Solid carbide	GF 200	
2944	351	3xD	~DIN 371	Taps for ISO metric threads	Solid carbide	H	D
3030	46		Company std.	XL ball nose slot drills (2-fluted)	Solid carbide	N	
3043	49		Company std.	XL ball nose end mills (4-fluted)	Solid carbide	N	
3049	45		DIN 6527L	Ball nose slot drills (2-fluted)	Solid carbide	N	B
3472	138		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	
3473	139		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	
3556	346		Company std.	Universal thread milling cutters for ISO metric threads	Solid carbide	TMU SP	
3557	347		Company std.	Universal thread milling cutters for BSP threads	Solid carbide	TMU SP	
3561	74		DIN 6527L	Slot drills with corner radius (2-fluted)	Solid carbide	N	A
3562	75		DIN 6527L	End mills with corner radius (4-fluted)	Solid carbide	N	A
3563	76		DIN 6527L	Multi-tooth end mills with corner radius GH 100 U	Solid carbide	NH	A
3599	136		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	A
3679	45		DIN 6527L	Ball nose slot drills (2-fluted)	Solid carbide	N	A
3682	122		DIN 6527L	Hard roughing end mills GS 100 H (fine teeth)	Solid carbide	HR	B
3691	127		Company std.	Multi-tooth end mills GH 100 U	Solid carbide	NH	
3693	128		Company std.	Multi-tooth end mills GH 100 U	Solid carbide	NH	
3723	123		DIN 6527L	Roughing end mills GS 100 U (fine teeth)	Solid carbide	NRf	B
3727	47		DIN 6528	Ball nose end mills (4-fluted)	Solid carbide	N	
3743	343	2xD	Company std.	Thread milling cutters without chamfer for ISO metric threads	Solid carbide	TM SP	
3748	344	2xD	Company std.	Thread milling cutters without chamfer for BSP threads	Solid carbide	TM SP	
3754	345	2xD	Company std.	Thread milling cutters without chamfer for NPT threads	Solid carbide	TM SP	
3769	348		Company std.	Universal thread milling cutters for NPT threads	Solid carbide	TMU SP	
3837	112		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	N	
3838	112		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	N	
3839	113		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	N	

Article no.	Page	Drilling depth	Standard	Description	Tool material	Type	Form
3871	113		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	N	
3872	109		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	N	A
3873	109		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	N	B
3897	125		Company std.	Ratio end mills Superfinish RF 100 SF	Solid carbide	NH	
3898	125		Company std.	Ratio end mills Superfinish RF 100 SF	Solid carbide	NH	
4001	342	2.5xD	Company std.	Micro thread milling cutters	Solid carbide	SC-MTM3-SP	
4002	336	2.5xD	Company std.	Micro thread milling cutters	Solid carbide	MTMH3-Z	
4071	266		Company std.	Clamping screws			
4106	210	1.5xD	Company std.	Tool holders for interchangeable inserts HT 800		HT 800 WP	
4107	212	3xD	Company std.	Tool holders for interchangeable inserts HT 800		HT 800 WP	
4108	214	5xD	Company std.	Tool holders for interchangeable inserts HT 800		HT 800 WP	
4109	216	7xD	Company std.	Tool holders for interchangeable inserts HT 800		HT 800 WP	
4110	218	10xD	Company std.	Tool holders for interchangeable inserts HT 800		HT 800 WP	
4111	220		Company std.	Interchangeable inserts HT 800	Solid carbide	HT 800 WP	
4112	223		Company std.	Interchangeable inserts HT 800	Solid carbide	HT 800 WP	
4114	226		Company std.	Interchangeable inserts HT 800	Solid carbide	HT 800 WP	
4115	229		Company std.	Interchangeable inserts HT 800	Solid carbide	HT 800 WP	
4161	355	1.5xD	~DIN 371	Taps for ISO metric fine threads	HSS-E-PM	H	D
4208	479		Company std.	Extensions HPC			
4213	473		Company std.	ISO taper hydraulic chucks with increased clamping force			
4218	360	3xD	DIN 371/DIN 376	Taps for ISO metric threads	HSS-E	VA	B
4219	365	1.5xD	DIN 374	Taps for ISO metric fine threads	HSS-E	VA	B
4220	367	1.5xD	DIN 5156	Taps for BSP threads	HSS-E	VA	B
4221	474		Company std.	MAS/BT hydraulic chucks with increased clamping force			
4226	340	3xD	Company std.	Micro thread milling cutters	Solid carbide	MTM3 SP	
4227	339	3xD	Company std.	Micro thread milling cutters	Solid carbide	MTMH3 SP	
4228	341	3xD	Company std.	Micro thread milling cutters	Solid carbide	MTM3 SP	
4229	232		Company std.	Interchangeable inserts HT 800	Solid carbide	HT 800 WP	
4232	491		DIN 69882-4	GÜHROJET HSK-A Weldon side lock holders			
4234	494		Company std.	GÜHROJET MAS/BT Weldon side lock holders			
4235	481		Company std.	Clamping sleeves for precision clamping chucks, sealed version			
4244	478		Company std.	MAS/BT precision clamping chucks			
4299	470		DIN 69882-7	HSK-A hydraulic chucks with increased clamping force			
4300	476		Company std.	HSK-A precision clamping chucks			
4301	477		Company std.	ISO taper precision clamping chucks			
4302	480		Company std.	GÜHROJET clamping sleeves, for precision clamping chucks			
4317	493		Company std.	GÜHROJET ISO taper Weldon side lock holders			
4364	501		Company std.	Adjustment screws “faces” for synchro tapping chucks with int. coolant		A/B	
4475	484		Company std.	HSK-E precision collet holders			
4476	483		Company std.	HSK-A precision collet holders			
4487	376		~DIN 371/~DIN 376	Fluteless taps for ISO metric threads	HSS-E-PM	N	C
4488	376		~DIN 371/~DIN 376	Fluteless taps for ISO metric threads	HSS-E-PM	N	C
4489	377		~DIN 374	Fluteless taps for ISO metric fine threads	HSS-E-PM	N	C
4490	377		~DIN 374	Fluteless taps for ISO metric fine threads	HSS-E-PM	N	C
4493	378		DIN 2189	Fluteless taps for BSP threads	HSS-E-PM	N	C
4496	338	2.5xD	Company std.	Micro thread milling cutters	Solid carbide	MTMH3 SP	
4525	498		Company std.	Straight shank hydraulic synchro tapping chucks for internal coolant			
4573	487		Company std.	Retaining nut for precision collet holders			
4574	485		Company std.	Precision collets for precision collet holders			
4575	486		Company std.	Precision collets for precision collet holders, sealed version			
4576	496		Company std.	ISO taper hydraulic synchro tapping chucks with internal coolant			
4577	497		Company std.	MAS/BT hydraulic synchro tapping chucks with internal coolant			
4596	469		Company std.	HSK-A hydraulic chucks, slim design 3°			
4597	472		Company std.	ISO taper hydraulic chucks, slim design 3°			
4598	475		Company std.	MAS/BT DC hydraulic chucks with axial plane			
4599	353	3xD	~DIN 371	Taps for BSP threads	Solid carbide	H	D
4601	495		Company std.	HSK-A hydraulic synchro tapping chucks with internal coolant			
4606	499		Company std.	GÜHROJET reduction bushes for hydraulic synchro tapping chucks			
4607	356	1.5xD	DIN 371	Taps for BSP threads	HSS-E-PM	H	D
4625	358		DIN 371/DIN 376	Taps for ISO metric threads	HSS-E	VA R45	C
4626	358		DIN 371/DIN 376	Taps for ISO metric threads	HSS-E	VA R45	C
4627	358		DIN 371/DIN 376	Taps for ISO metric threads	HSS-E	VA R45	C
4628	364		DIN 374	Taps for ISO metric fine threads	HSS-E	VA R45	C
4633	359		Company std.	Taps for ISO metric threads	HSS-E	VA R45	C
4638	361		DIN 371/DIN 376	Taps for ISO metric threads	HSS-E	VA	B
4639	361		DIN 371/DIN 376	Taps for ISO metric threads	HSS-E	VA	B
4640	361		DIN 371/DIN 376	Taps for ISO metric threads	HSS-E	VA	B
4641	365		DIN 374	Taps for ISO metric fine threads	HSS-E	VA	B
4645	362		Company std.	Taps for ISO metric threads	HSS-E	VA	B
4683	375		DIN 5156	Taps for Rc (BSPT) threads	HSS-E-PM	H	C
4719	467		Company std.	Shrink fit extensions			
4729	463		Company std.	ISO taper shrink fit chucks GÜHROJET			

Article no.	Page	Drilling depth	Standard	Description	Tool material	Type	Form
4736	452		DIN 69882-8	HSK-A shrink fit chucks			
4737	458		Company std.	HSK-E shrink fit chucks			
4738	461		Company std.	ISO taper shrink fit chucks			
4739	464		Company std.	MAS/BT shrink fit chucks			
4755	455		Company std.	HSK-A shrink fit chucks GÜHROJET with peripherical cooling			
4770	349		Company std.	Universal thread milling cutters for Rc threads	Solid carbide	TMU SP	
4780	337	2.5xD	Company std.	Micro thread milling cutters	Solid carbide	MTMH3-Z	
4787	451		Company std.	Shrink fit chucks HSK-A, slim design 3°			
4788	460		Company std.	ISO taper shrink fit chucks, slim design 3°			
4789	457		Company std.	Shrink fit chucks HSK-E, slim design 3°			
4790	466		Company std.	MAS/BT DC shrink fit chucks with axial plane			
4915	263		Company std.	Torque wrenches		A	
4917	265		Company std.	Torx socket sets			
4966	262		Company std.	Torque wrenches set			
4981	490		Company std.	Torque wrenches			
4994	488		Company std.	Roller bearing wrenches for precision collet holders			
4995	489		Company std.	Roller bearing wrenches head for torque wrenches			
5164	244	GL1000	Company std.	EB 80 XXL single-fluted gun drills	Carbide	EB 80 XXL	
5492	148		Company std.	PCD slot drills (2-fluted)	PCD	H	AX
5493	149		Company std.	PCD slot drills (2-fluted)	PCD	H	AX
5498	184	5xD	DIN 6537L	Ratio drills with coolant ducts	Solid carbide	RT 100 XF	
5499	190	7xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 XF	
5500	415		DIN 335	90° Countersinks, spiral-fluted	HSCO		C
5501	416		DIN 335	90° Countersinks, spiral-fluted	HSCO		C
5503	417		Company std.	90° Countersinks, spiral-fluted	HSS		C
5510	176	3xD	DIN 6537K	Ratio drills with coolant ducts	Solid carbide	RT 100 U	
5511	182	5xD	DIN 6537L	Ratio drills with coolant ducts	Solid carbide	RT 100 U	
5512	188	7xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 U	
5514	200	3xD	DIN 6537K	Ratio drills without coolant ducts	Solid carbide	RT 100 U	
5525	193	12xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 U	
5527	402		Company std.	NC machine reamers	Solid carbide		B
5534	110		DIN 6527K	Standard Ratio end mills RF 100 U	Solid carbide	N	B
5535	111		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	N	B
5538	418		DIN 335	90° Countersink sets, spiral-fluted	HSCO		C
5539	419		DIN 335	90° Countersink sets, spiral-fluted	HSCO		C
5578	131		Company std.	Chamfering milling cutters 90°	Solid carbide	N	
5579	131		Company std.	Chamfering milling cutters 90°	Solid carbide	N	
5582	114		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	N	
5639	237	20xD	Company std.	EB 80 single-fluted gun drills	Carbide	EB 80	
5640	238	30xD	Company std.	EB 80 single-fluted gun drills	Carbide	EB 80	
5641	239	40xD	Company std.	EB 80 single-fluted gun drills	Carbide	EB 80	
5642	241	80xD	Company std.	EB 80 single-fluted gun drills	Carbide	EB 80	
5646	234	25xD	Company std.	EB 100 M single-fluted gun drills	Solid carbide	EB 100 M	
5647	235	50xD	Company std.	EB 100 M single-fluted gun drills	Solid carbide	EB 100 M	
5648	236	75xD	Company std.	EB 100 M single-fluted gun drills	Solid carbide	EB 100 M	
5669	240	60xD	Company std.	EB 80 single-fluted gun drills	Carbide	EB 80	
5670	420		DIN 334	60° Countersinks, spiral-fluted	HSS		C
5671	421		DIN 334	60° Countersinks, spiral-fluted	HSS		C
5672	422		DIN 334	60° Countersink sets, spiral-fluted	HSS		C
5673	423		DIN 334	60° Countersink sets, spiral-fluted	HSS		C
5674	424		Company std.	82° Countersinks, spiral-fluted	HSCO		C
5675	425		Company std.	82° Countersinks, spiral-fluted	HSCO		C
5676	426		Company std.	82° Countersink sets, spiral-fluted	HSCO		C
5677	427		Company std.	82° Countersink sets, spiral-fluted	HSCO		C
5678	289		Company std.	90° NC spotting drills	HSCO	N	
5679	291		Company std.	120° NC spotting drills	HSCO	N	
5681	246	GL1400	Company std.	EB 80 XXL single-fluted gun drills	Carbide	EB 80 XXL	
5682	248	GL1800	Company std.	EB 80 XXL single-fluted gun drills	Carbide	EB 80 XXL	
5688	242	GL 600	Company std.	EB 80 XXL single-fluted gun drills	Carbide	EB 80 XXL	
5691	243	GL 800	Company std.	EB 80 XXL single-fluted gun drills	Carbide	EB 80 XXL	
5692	245	GL1200	Company std.	EB 80 XXL single-fluted gun drills	Carbide	EB 80 XXL	
5693	247	GL1600	Company std.	EB 80 XXL single-fluted gun drills	Carbide	EB 80 XXL	
5694	249	GL2000	Company std.	EB 80 XXL single-fluted gun drills	Carbide	EB 80 XXL	
5735	111		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	N	A
5747	251		Company std.	Drill bushes	HSS		
5748	250		Company std.	Drill bushes	Solid carbide		
5750	253		Company std.	Moulded steady rest bushings for single-fluted gun drills	Plastic		
5752	257		Company std.	Sealing disks for single-fluted gun drills	Plastic		
5766	261		Company std.	Sealing plugs	Steel		
5767	255		Company std.	Moulded steady rest bushings for single-fluted gun drills	Plastic		
5770	259		Company std.	Sealing disks for single-fluted gun drills	Plastic-metal		
5772	260		Company std.	Sealing disks for single-fluted gun drills	Plastic		

Article no.	Page	Drilling depth	Standard	Description	Tool material	Type	Form
6013	130		Company std.	Front/back deburrer 90°, sets	Solid carbide	EW 100 VR	
6016	400		Company std.	NC machine reamers	Solid carbide		B
6017	401		Company std.	NC machine reamers	Solid carbide		B
6018	404		Company std.	NC machine reamers	Solid carbide		B
6019	407		DIN 212-3	NC machine reamers	HSS-E		B
6020	408		DIN 212-3	NC machine reamers	HSS-E		B
6027	290		Company std.	90° NC spotting drills	Solid carbide	N	
6028	292		Company std.	120° NC spotting drills	Solid carbide	N	
6029	293		Company std.	142° NC spotting drills	Solid carbide	N	
6400	205	4xD	Company std.	ExclusiveLine micro-precision drills without coolant ducts	Solid carbide	N	
6401	206	7xD	Company std.	ExclusiveLine micro-precision drills without coolant ducts	Solid carbide	N	
6405	207	5xD	Company std.	ExclusiveLine micro-precision drills with coolant ducts	Solid carbide	N	
6408	208	8xD	Company std.	ExclusiveLine micro-precision drills with coolant ducts	Solid carbide	N	
6412	209	15xD	Company std.	ExclusiveLine micro-precision drills with coolant ducts	Solid carbide	N	
6478	105		Company std.	Ratio end mills RF 100 Sharp	Solid carbide	N	
6479	105		Company std.	Ratio end mills RF 100 Sharp	Solid carbide	N	B
6480	106		Company std.	Ratio end mills RF 100 Sharp	Solid carbide	N	
6481	106		Company std.	Ratio end mills RF 100 Sharp	Solid carbide	N	B
6498	178	3xD	DIN 6537K	Ratio drills with coolant ducts	Solid carbide	RT 100 XF	
6509	195	15xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 T	
6511	196	20xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 T	
6512	197	25xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 T	
6513	198	30xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 T	
6514	199	40xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 T	
6702	138		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	
6703	139		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	
6707	48		DIN 6527L	Ratio end mills RF 100 VA	Solid carbide	N	A
6708	48		DIN 6527L	Ratio end mills RF 100 VA	Solid carbide	N	B
6709	124		Company std.	Ratio end mills Superfinish RF 100 SF	Solid carbide	NH	
6710	124		Company std.	Ratio end mills Superfinish RF 100 SF	Solid carbide	NH	
6716	95		~DIN 6527L	Pilot end mills RF 100 P	Solid carbide	NH	A
6721	147		Company std.	Slot drills XL (3-fluted)	Solid carbide	N	
6722	145		DIN 6527L	Slot drills with corner radius (2-fluted)	Solid carbide	N	A
6723	146		DIN 6527L	End mills with corner radius (4-fluted)	Solid carbide	N	A
6724	143		DIN 6527L	Ball nose slot drills (2-fluted)	Solid carbide	N	A
6725	144		Company std.	Ball nose end mills (4-fluted)	Solid carbide	N	
6726	108		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	N	A
6727	126		Company std.	Ratio end mills Superfinish RF 100 SF	Solid carbide	NH	
6728	107		~DIN 6527L	Standard Ratio end mills RF 100 U (3-fluted)	Solid carbide	N	
6729	136		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	A
6730	140		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	A
6731	140		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	A
6732	141		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	A
6733	141		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	A
6734	142		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	A
6735	142		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	A
6736	94		DIN 6527L	Ratio end mills RF 100 Diver	Solid carbide	NH	B
6737	94		DIN 6527L	Ratio end mills RF 100 Diver	Solid carbide	NH	A
6760	99		Company std.	Ratio end mills RF 100 Speed M	Solid carbide	NH	B
6761	100		Company std.	Ratio end mills RF 100 Speed M	Solid carbide	NH	B
6765	99		Company std.	Ratio end mills RF 100 Speed M	Solid carbide	NH	A
6766	100		Company std.	Ratio end mills RF 100 Speed M	Solid carbide	NH	A
6767	115		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	NH	A
6768	115		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	NH	B
6784	132		Company std.	Chamfering milling cutters 90°	Solid carbide	H	
6785	132		Company std.	Chamfering milling cutters 90°	Solid carbide	H	
6786	133		Company std.	90° Chamfering milling cutters SpyroTec	Solid carbide	N	
6787	133		Company std.	90° Chamfering milling cutters SpyroTec	Solid carbide	N	
6797	92		~DIN 6527L	Ratio end mills RF 100 Diver (3-fluted)	Solid carbide	NH	
6798	92		~DIN 6527L	Ratio end mills RF 100 Diver (3-fluted)	Solid carbide	NH	
6803	93		DIN 6527K	Ratio end mills RF 100 Diver	Solid carbide	N	
6804	93		DIN 6527K	Ratio end mills RF 100 Diver	Solid carbide	N	
6808	90	2.5xD	Company std.	Ratio end mills RF 100 Microdiver	Solid carbide	NH	
6809	91	5xD	Company std.	Ratio end mills RF 100 Microdiver	Solid carbide	NH	
6814	72		Company std.	High feed end mills G-Mold 65 HF	Solid carbide	H	
6815	29		Company std.	Ball nose end mills G-Mold µ 65 B	Solid carbide	H	
6816	30		Company std.	Ball nose end mills G-Mold µ 65 B	Solid carbide	H	
6817	31		Company std.	Ball nose end mills G-Mold µ 65 B	Solid carbide	H	
6818	32		Company std.	Ball nose end mills G-Mold µ 65 B	Solid carbide	H	
6819	33		Company std.	Ball nose end mills G-Mold µ 65 B	Solid carbide	H	
6820	55		Company std.	Torus end mills G-Mold µ 65 T	Solid carbide	NH	
6821	56		Company std.	Torus end mills G-Mold µ 65 T	Solid carbide	NH	

Article no.	Page	Drilling depth	Standard	Description	Tool material	Type	Form
6822	57		Company std.	Torus end mills G-Mold µ 65 T	Solid carbide	N	
6823	58		Company std.	Torus end mills G-Mold µ 65 T	Solid carbide	N	
6824	59		Company std.	Torus end mills G-Mold µ 65 T	Solid carbide	N	
6825	78		Company std.	Finishing end mills G-Mold µ 48 F	Solid carbide	NH	
6826	79		Company std.	Finishing end mills G-Mold µ 48 F	Solid carbide	NH	
6827	80		Company std.	Finishing end mills G-Mold µ 65 F	Solid carbide	H	
6828	81		Company std.	Finishing end mills G-Mold µ 65 F	Solid carbide	H	
6829	88		Company std.	Micro-precision milling cutters MicroMill µ 55	Solid carbide	N	
6830	71		Company std.	High feed end mills G-Mold 65 HF	Solid carbide	H	
6831	73		Company std.	High feed end mills G-Mold 65 HF	Solid carbide	H	
6832	34		Company std.	Ball nose end mills G-Mold 65 B	Solid carbide	H	
6833	35		Company std.	Ball nose end mills G-Mold 65 B	Solid carbide	H	
6834	36		Company std.	Ball nose end mills G-Mold 65 B	Solid carbide	N	
6835	37		Company std.	Ball nose end mills G-Mold 65 B	Solid carbide	H	
6836	38		Company std.	Ball nose end mills G-Mold 65 B	Solid carbide	H	
6837	60		Company std.	Torus end mills G-Mold 65 T	Solid carbide	H	
6838	62		Company std.	Torus end mills G-Mold 65 T	Solid carbide	NH	
6844	39		Company std.	Ball nose end mills G-Mold 55 B	Solid carbide	N	
6845	40		Company std.	Ball nose end mills G-Mold 55 B	Solid carbide	N	
6846	41		Company std.	Ball nose end mills G-Mold 55 B	Solid carbide	N	
6847	42		Company std.	Ball nose end mills G-Mold 55 B	Solid carbide	N	
6848	43		Company std.	Ball nose end mills G-Mold 55 B	Solid carbide	N	
6849	44		Company std.	Ball nose end mills G-Mold 55 B	Solid carbide	N	
6850	63		Company std.	Torus end mills G-Mold 55 T	Solid carbide	NH	
6851	65		Company std.	Torus end mills G-Mold 55 T	Solid carbide	NH	
6852	67		Company std.	Torus end mills G-Mold 55 T	Solid carbide	NH	
6853	68		Company std.	Torus end mills G-Mold 55 T	Solid carbide	NH	
6854	69		Company std.	Torus end mills G-Mold 55 T	Solid carbide	N	
6855	70		Company std.	Torus end mills G-Mold 55 T	Solid carbide	N	
6858	101		Company std.	Ratio end mills RF 100 5 Speed	Solid carbide	N	
6859	101		Company std.	Ratio end mills RF 100 5 Speed	Solid carbide	N	B
6860	102		Company std.	Ratio end mills RF 100 5 Speed	Solid carbide	N	
6861	102		Company std.	Ratio end mills RF 100 5 Speed	Solid carbide	N	B
6881	118		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	HF	
6882	118		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	HF	B
6883	119		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	HF	
6884	119		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	HF	
6885	120		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	HF	
6886	120		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	HF	
6889	121		DIN 6527L	High-performance roughing end mills RS 100 F	Solid carbide	NF	
6890	121		DIN 6527L	High-performance roughing end mills RS 100 F	Solid carbide	NF	B
6943	86		DIN 6527L	Ratio end mills G-Mold 65 U	Solid carbide	H	
6944	86		DIN 6527L	Ratio end mills G-Mold 65 U	Solid carbide	H	B
6945	82		Company std.	Finishing end mills G-Mold 65 F	Solid carbide	H	
6946	83		Company std.	Finishing end mills G-Mold 65 F	Solid carbide	H	
6947	84		Company std.	Finishing end mills with corner radius G-Mold 65 FR	Solid carbide	H	
6948	85		Company std.	Finishing end mills with corner radius G-Mold 65 FR	Solid carbide	H	
6958	96		Company std.	Ratio end mills RF 100 Speed P	Solid carbide	NH	
6959	96		Company std.	Ratio end mills RF 100 Speed P	Solid carbide	NH	B
6960	97		Company std.	Ratio end mills RF 100 Speed P	Solid carbide	NH	
6961	97		Company std.	Ratio end mills RF 100 Speed P	Solid carbide	NH	B
6964	103		DIN 6527L	Ratio end mills RF 100 iMill	Solid carbide	N	
6965	103		DIN 6527L	Ratio end mills RF 100 iMill	Solid carbide	N	B
6969	77		DIN 6527L	Multi-tooth end mills GH 100 U	Solid carbide	NH	
6970	116		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	HRf	
6971	116		DIN 6527L	Standard Ratio end mills RF 100 U	Solid carbide	HRf	B
6972	117		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	HRf	
6973	117		Company std.	Standard Ratio end mills RF 100 U	Solid carbide	HRf	B
6978	137		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	
6979	137		Company std.	Ratio end mills Alu RF 100 A	Solid carbide	W	
6984	135		Company std.	Ball nose end mills GA 200 A	Solid carbide	W	
6992	134		Company std.	90° Chamfering milling cutters SpyroTec	Solid carbide	N	
6993	134		Company std.	90° Chamfering milling cutters SpyroTec	Solid carbide	N	
8520	180	3xD	DIN 6537K	Ratio drills with coolant ducts	Solid carbide	RT 100 HF	
8521	186	5xD	DIN 6537L	Ratio drills with coolant ducts	Solid carbide	RT 100 HF	
8522	192	7xD	Company std.	Ratio drills with coolant ducts	Solid carbide	RT 100 HF	
8524	202	3xD	DIN 6537K	Ratio drills without coolant ducts	Solid carbide	RT 100 HF	
9000	294	~5xD	DIN 338	Jobber drills	HSCO	GU 3FS	
9001	295	~5xD	DIN 338	Twist drill sets	HSCO	GU 3FS	

ISO codes

P	Steel, high-alloyed steel
M	Stainless steel
K	Grey cast iron, spheroidal graphite iron and malleable cast iron
N	Aluminium and other non-ferrous metals
S	Special, super and titanium alloys
H	Hardened steel and chilled cast iron

On the programme pages you will find for every tool recommendations regarding suitability for the application groups and details of max. tensile strength and hardness.

● optimal suitability
○ limited suitability

Surfaces

- P AlCrN
- F FIRE/nanoFIRE
- A TiAlN SuperA
- bright
- X Perrox
- C TiCN
- Cb Carbo
- R Raptor
- TiSiN
- D Cristall C
- Y Signum
- S TiN
- X Durox
- A TiAlN
- Ni nickel-plated
- nitrided lands
- a TiAlN nanoA

Pictograms

Tool material

VHM Solid carbide · HM Carbide · HSS High-speed steel · HSCO · HSS-E · HSS-E-PM · Cermet · PKD Polycrystalline diamond

Machining depth

3xD · 5xD · 7xD · 8xD · 10xD · 12xD · 15xD · 20xD · 25xD · 80xD · ~5xD · ~10xD · >25xD · GL 600 · GL 1200 · GL 2000 ...

Tolerance on Ø

m7 · h5 · h6 · h7 · H7 · h8 · ISO2/6H · 6HX · ISO3/6G · 6GX · 7GX · 6H +0,1 · ±0,015 · +0,004 +0,005 ...

Shank form

HA · HB · HE · B · ~HA to DIN 6535 · Cyl cylindrical · MK Morse taper · 3 3-flats on shank · TBM-SEH Standard groove rear

Standard

DIN 208 · DIN 338 · DIN 340 · DIN 371 · DIN 376 · DIN 371/376 · DIN 1897 · DIN 6527 K · DIN 6527 L · DIN 6537 K · DIN 6537 L · DIN 5156 · DIN 6528 · ~DIN 8094 ... to DIN · WN to Gühring Standard

Type

N · H · W · VA · NRf · RT 100 HF · RT 100 U · RT 100 T · RT 100 XF · GU 3FS · GT 500 DZ · EB 80 XXL · HT 800 WP · MTMH3-Z · TM SP · EW 100 VR ...

Internal coolant

with internal coolant · without internal coolant

Cutting direction

R right-hand

Hole type

Through-hole threads · Blind-hole threads · Through-hole and blind-hole threads

Form

B · C · D

Application

Slotting · Roughing · Ramping · Helix · Drilling · Finishing · Copying

Length

short (DIN) · long (DIN) 2,5xD + · medium length 3xD · extra length 4xD 5xD

No. of cutting edges

2 · 3 · 4 · 5 · 6 · 6+ · 2-4 · 3-4 · 4-5 · 5-6 ... No. of major cutting edges

Spacing

≠ unequal · EU extremely unequal

Helix angle

2-4° · 0° · 7° · 20° · 30° · 45° · 35° 38° · 36° 38° 37° · 40° 42° · 44° 45° 46° ... Size of helix angle/no. of different helix angles

straight-fluted · left-hand helix

Rake angle

-2° · -3° · -7° · 0° · 3° · 4° · 7° · 9° · 10° · 12° ... Rake angle of circumference cutting edges

Cutting edge form

45° Corner chamfer · R ±0,01 · R ±0,02 · R ±0,01 · R ±0,03 · R ±0,05 ... Radius with tolerance · 90° Chamfer end mill angles · 82° · 120° · 135° · 140° · 160° 125° ... Point angle

Feed

for lateral feed · for lateral feed and oblique plunging · for lateral feed, oblique plunging and drilling

Hardness

48 HRC · 55 HRC · 62 HRC · 63 HRC · 65 HRC · 66 HRC workable material hardness in HRC

Interfaces

HSK-A · HSK-E · SK · MAS-BT Interfaces for tool holders

GÜHRING Mould & Die

MOULD & DIE



GÜHRING KG

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