

GRANLUND

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Main Catalogue EN



ISO 9001
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Certification



ISO 14001
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and thoroughly checked. They cannot, however, bind our responsibility on their exactness.*

GRANLUND TOOLS AB, SWEDEN



When precision counts...

Granlund Tools AB in Eskilstuna are one of the world's leading manufacturers of precision tools within the machining industry.

Granlund offers a wide range of high-quality, carbide and HSS cutting tools, such as counterbores, counter-sinks, tools with indexable inserts and reamers.

With more than 60 years' experience and representation in some 30 countries around the world, Granlund can offer the market proven technical solutions and good local support.

The Granlund interchangeable tool system was one of the first Granlund products to receive world recognition.

With only 1300 parts, consisting of holders, cutters, pilots and drills, it is possible to assemble combination tools in more than 1 500 000 different variations.

Our flexible easy-to-use system provides productive and cost-efficient tool solutions for industries world-wide.

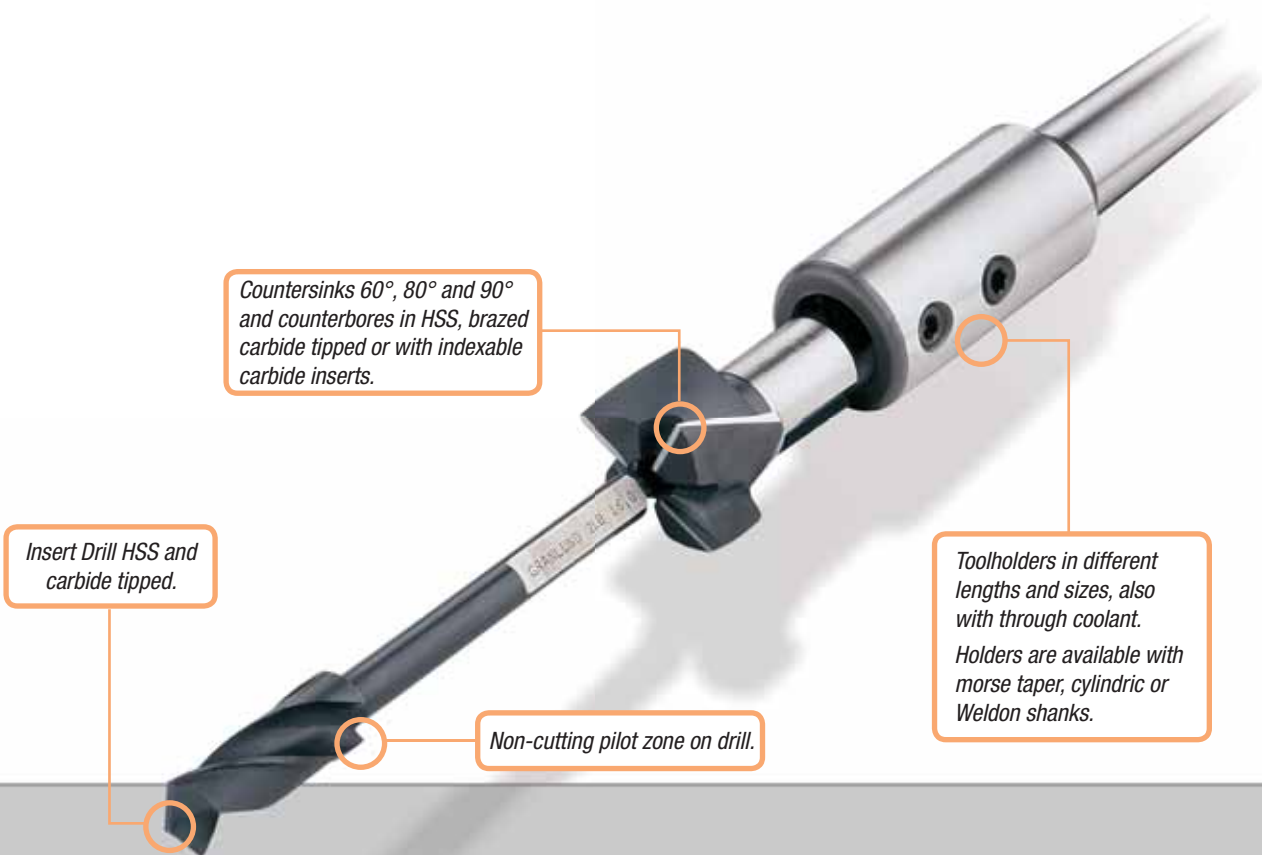
Granlund companies also perform:

- **Subcontract work**, where we offer solutions regarding production and or assembly in large or small series.
- **Heat treatment** in a modern vacuum hardening/quenching plant.
- **Engineering**. Manufacture of special measure machines including the software.
- **Machinery**. Manufacture of special machinery for tube elements and special grinding machines for the tube industry.

The company is certified according to ISO 9001 and ISO 14001.

GRANLUND – Tools, supplies where high quality and precision are required.





The Granlund System

Granlund's unique tool system for countersinking and counterboring helps you to increase productivity and lower your costs.

Our toolholders, counterbores, insert drills and pilots may be combined to fit all types of machines and applications.

You can, with only 1300 parts, easily build more than 1 500 000 special tools.

The system is grouped into 4 sizes: size 01, size 0, size 1 and size 2. All combinations have to be made with elements belonging to the same group size. Groups are not interchangeable.

The range of tools available for each group size along with recommendations for correct tool selection and cutting data can be found in the following pages.

	Granlund Counterboring System 6	Counterboring / Countersinking
	Counterboring System Size 01 8 Insert drills, Pilots, Counterbores, Countersinks Holders, Sets and Inserts	
	Counterboring System Size 0 10 Insert drills, Pilots, Counterbores, Countersinks Holders, Sets and Inserts	
	Counterboring System Size 1 12 Insert drills, Pilots, Counterbores, Countersinks Holders, Sets and Inserts	
	Counterboring System Size 2 16 Insert drills, Pilots, Counterbores, Countersinks Holders, Sets and Inserts	
	CNC Tools 20 Counterbores, Boring, Chamfering and Face Milling Tools	Backspotfacing
	Countersinks 24 Countersinks type 100 and type FV	
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	CNC Backspotfacing / Chamfering Tools 30 CNC Backspotfacers, Back Spotchamfers and Front / Back Spotchamfers, Inserts	Reaming
	Hard Part Reaming 31	
	Single Flute Reamers RD, RA, RB 32	
	Carbide Reamers, fixed and re-sizeable 34 Reamers, floating toolholders, collets	Spirabore System
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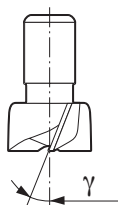
Tool selection

This table shows pictures of each type of tool and its diameter range within each size (01,0,1,2). Make your tool combination by choosing components from the same size.

Special editions: Insert drills and counterbores HSS all dimensions and system sizes are "Uncoated Blank" as standard.
Coatings: TiN, TiCN, FUTURA, HARDLUBE are additional.
For price and delivery time, contact your Granlund representative.



	Insert drills		Pilots			Counterbores				Countersinks					
	B Ø mm	LB Ø mm	BH Ø mm	F Ø mm	R Ø mm	N Ø mm	NA Ø mm	W Ø mm	H Ø mm	HA Ø mm	WHV Ø mm	T Ø mm	TH Ø mm	TK Ø mm	KV Ø mm
01	2,5-3,7	2,5-3,7		2,4-8				5-16				6-10,4			
0	4,2-7	4,2-7	5-6,8	4-5,8	6-14	7-24	7-24	7-16,5	10-24	10-24	18-20	8-16,5			20,5-25
1	6,5-12	6,5-12	6,5-12	6-6,8	7-24	10-38	10-38	10-25	12-38	12-38	20-36	11,5-30	20-30	16,5-34	26-30
2	11-25	11-25	11-21		10-50	16-85	16-85	16-40	18-75	18-75	34-75	20-85	40-60	30-75	32-60



Recommended choice of tool for working in different materials



	N	NA	W	H	HA	WHV	T	TH	TK	KV
Helix angle (γ)	24°	35°	28°	5°	24°	5°				
Steel	•	•	•			•	•		•	•
Stainless steel	•	•	•				•		•	
Cast iron				•	•	•		•		•
Aluminium (Long chips)		•	•				•		•	
Cast Aluminium (Short chips)					•	•		•		
Plastics soft		•					•		•	
Plastics hard				•	•			•		
Copper	•	•	•				•		•	
Bronze/Brass				•	•	•		•		•
HARDOX						•				•



Tool holders

	A	AS	M	NS	L	S	GS	
Morse Taper	MT 1					MT 1		01
Cylindrical Ø mm	6,0 10,0					10		
Morse Taper	MT 1-2				MT 1	MT 1		0
Cylindrical Ø mm	8,0 10,0					10		
Weldon				W 16				
Morse Taper	MT 1-2-3		MT 3	MT 2-3	MT 2	MT 2	MT 3	1
Cylindrical Ø mm	10-12				20	10		
Weldon	W 20	W 20	W 25	W 20			W 25	
Morse Taper	MT 2-3-4-5		MT 3-4	MT 3-4	MT 3	MT 3	MT 3	2
Cylindrical Ø mm					32			
Weldon	W 20	W 25	W 32	W 25			W 25	

Cutting data, counterbores and countersinks



	N	NA	W	H	HA	WHV	KV*	T	TK	TH	Material
Tensile Strength N/mm ² Hardness HB	HSS Speed m/min	HSS Feed mm/rev.	Carbide Speed m/min	Carbide Feed mm/rev.	Carbide Speed m/min	Carbide Feed mm/rev.	HSS Speed m/min	HSS Feed mm/rev.	Carbide Speed m/min	Carbide Feed mm/rev.	
<450 N/mm ²	20 - 40	0,10 - 0,5	60 - 130	0,1 - 0,6	75 - 130	0,1 - 0,6	15 - 30	0,05 - 0,3	20 - 50	0,05 - 0,3	Steel
<600 N/mm ²	15 - 30	0,10 - 0,4	50 - 110	0,1 - 0,5	65 - 120	0,1 - 0,5	10 - 25	0,05 - 0,3	15 - 45	0,05 - 0,3	Steel
<1000 N/mm ²	10 - 25	0,05 - 0,3	40 - 110	0,1 - 0,3	55 - 100	0,1 - 0,4	10 - 20	0,05 - 0,3	10 - 40	0,05 - 0,3	Steel
>1000 N/mm ²	5 - 20	0,05 - 0,3	30 - 90	0,1 - 0,2	45 - 90	0,1 - 0,4	5 - 15	0,05 - 0,3	10 - 35	0,05 - 0,3	Steel
<800 N/mm ²	10 - 25	0,05 - 0,3	30 - 90	0,1 - 0,3	45 - 90	0,1 - 0,4	5 - 15	0,05 - 0,3	10 - 35	0,05 - 0,3	Cast Steel
	10 - 20	0,10 - 0,3	20 - 60	0,1 - 0,4	30 - 60	0,1 - 0,3	5 - 15	0,05 - 0,3	10 - 35	0,05 - 0,3	Stainless Steel
<180 HB	20 - 40	0,20 - 0,5	60 - 120	0,2 - 0,5	80 - 120	0,2 - 0,5	10 - 25	0,05 - 0,3	20 - 50	0,05 - 0,3	Cast Iron
<200 HB	20 - 35	0,20 - 0,4	50 - 100	0,2 - 0,4	80 - 120	0,2 - 0,5	10 - 20	0,05 - 0,3	10 - 40	0,05 - 0,3	Cast Iron
<220 HB	10 - 30	0,10 - 0,4	40 - 100	0,2 - 0,4	70 - 110	0,1 - 0,4	5 - 15	0,05 - 0,3	10 - 35	0,05 - 0,3	Cast Iron
<180 HB	20 - 40	0,10 - 0,4	60 - 120	0,2 - 0,5	80 - 120	0,1 - 0,5	15 - 25	0,05 - 0,3	20 - 45	0,05 - 0,3	Malleable Iron
<200 HB	15 - 35	0,10 - 0,4	50 - 110	0,2 - 0,5	75 - 110	0,1 - 0,5	10 - 20	0,05 - 0,3	15 - 40	0,05 - 0,3	Malleable Iron
<220 HB	10 - 30	0,10 - 0,4	40 - 100	0,2 - 0,5	60 - 110	0,1 - 0,4	5 - 15	0,05 - 0,3	10 - 35	0,05 - 0,3	Malleable Iron
	100 - 300	0,05 - 0,5	100 - 350	0,1 - 0,8	80 - 150	0,2 - 1,0	20 - 50	0,05 - 0,3	40 - 80	0,05 - 0,3	Aluminium Soft
	100 - 200	0,05 - 0,5	100 - 350	0,1 - 0,8	100 - 200	0,2 - 1,0	30 - 70	0,05 - 0,3	30 - 70	0,05 - 0,3	Aluminium Hard
	100 - 200	0,10 - 0,5	200 - 350	0,1 - 0,5	100 - 200	0,2 - 1,0	30 - 70	0,05 - 0,3	30 - 70	0,05 - 0,3	Cast Aluminium
	30 - 60	0,10 - 0,5	50 - 150	0,1 - 0,8	80 - 150	0,1 - 0,5	20 - 40	0,05 - 0,3	25 - 80	0,05 - 0,3	Bronze
	40 - 80	0,10 - 0,4	50 - 150	0,1 - 0,4	80 - 200	0,2 - 0,6	20 - 60	0,05 - 0,3	40 - 100	0,05 - 0,3	Brass
	30 - 60	0,10 - 0,4	50 - 150	0,1 - 0,4	50 - 120	0,2 - 0,4	20 - 50	0,05 - 0,3	30 - 80	0,10 - 0,3	Copper
					30 - 60	0,1 - 0,2					HARDOX
	50 - 100	0,10 - 0,5					40 - 80	0,05 - 0,3			Plastics Soft
			70 - 200	0,1 - 0,5	90 - 200	0,2 - 0,5			50 - 80	0,05 - 0,3	Plastics Hard

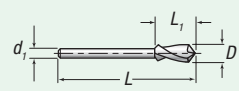
* Cutting data for type KV = 0,7 x WHV.



Ø mm	Insert drills		Pilots
	B	LB	F
	HSS	HSS	
	Tol.h8 Flute 12 mm	Tol.h8 Flute 17 mm	Tol.c9
	Part No.	Part No.	Part No.
2,4			01F-02,4
2,5	01B-02,5	01LB-02,5	01F-02,5
2,6			01F-02,6
2,7	01B-02,7		01F-02,7
2,9			01F-02,9
3,0	01B-03,0	01LB-03,0	01F-03,0
3,2	01B-03,2	01LB-03,2	01F-03,2
3,3	01B-03,3	01LB-03,3	01F-03,3
3,4	01B-03,4		01F-03,4
3,5	01B-03,5	01LB-03,5	01F-03,5
3,6	01B-03,6		01F-03,6
3,7	01B-03,7	01LB-03,7	
3,9			01F-03,9
4,0			01F-04,0
4,2			01F-04,2
4,5			01F-04,5
4,8			01F-04,8
5,0			01F-05,0
5,3			01F-05,3
5,5			01F-05,5
6,0			01F-06,0
6,4			01F-06,4
6,5			01F-06,5
6,6			01F-06,6
6,8			01F-06,8
7,0			01F-07,0
7,5			01F-07,5
8,0			01F-08,0

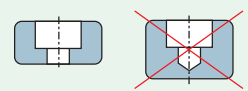
Ø mm	Counterbores and countersinks	
	W	T
	HSS	HSS
	Tol.p8 Flute 16 mm	Tol.x9 Flute 16 mm
	Part No.	Part No.
5,0	01W-05,0	
5,5	01W-05,5	
5,9	01W-05,9	
6,0	01W-06,0	01T9-06,0
6,3	01W-06,3	01T9-06,3
6,4	01W-06,4	
6,5	01W-06,5	
6,7		01T9-06,7
6,8	01W-06,8	
7,0	01W-07,0	01T9-07,0
7,3		01T9-07,3
7,5	01W-07,5	
8,0	01W-08,0	01T9-08,0
8,3		01T9-08,3
8,5	01W-08,5	
8,6		01T9-08,6
9,0	01W-09,0	
9,4		01T9-09,4
9,5	01W-09,5	
10,0	01W-10,0	01T9-10,0
10,4		01T9-10,4
10,5	01W-10,5	
11,0	01W-11,0	
12,0	01W-12,0	
12,5	01W-12,5	
13,0	01W-13,0	
14,0	01W-14,0	
15,0	01W-15,0	
16,0	01W-16,0	

B and LB

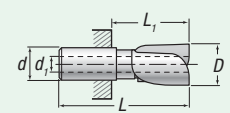


Important!
• It is important to note that when combining insert drills with countersinks, the drill must break through the work piece before secondary cutting commences and must not be used in blind holes.

Type	d_i	L	L_i
B	2,4	47,0	12,0
LB	2,4	52,0	17,0

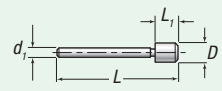


W



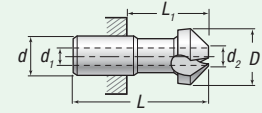
Type	d	d_i	L	L_i
W	7,0	2,4	28,0	16,0

F



Type	d_i	L	L_i
F	2,4	40,0	6,0

T



Type	d	d_i	d_{min}	L	L_i
T	7,0	2,4	2,7	28,0	16,0

Size 01



Tool holders

A

Shank	Part No.
MT1	01A-MK1
Ø6	01A-6
Ø10	01A-10



Tool holders

S

With rotating depth-stop

Shank	Part No.
MT1	01S-MK1
Ø10	01S-10

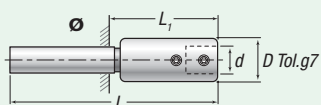
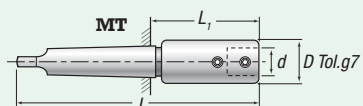


Set

Part No. 01P / M3-M6

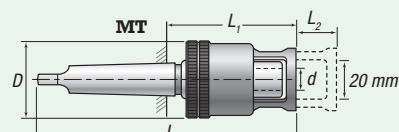
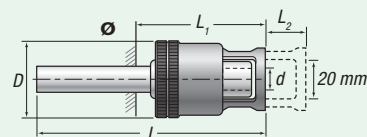
Counterbores type W, Ø mm	Pilots type F, Ø mm	Tool holders
5,0	2,4	01A-Ø6 mm
5,5	2,5	
6,0	3,0	
6,5	3,2	
7,0	3,4	
7,5	3,5	
8,0	3,6	
8,5	4,0	
9,0	4,2	
9,5	4,5	
10,0	5,0	
10,5	5,5	
11,0	6,0	
	6,5	
	6,6	
	7,0	

01A



Type	D Tol. g7	d	L	L ₁	Shank
01A-MK1	14	7	120	58	MT1
01A-06	14	7	86	45	Ø6
01A-10	14	7	86	45	Ø10

01S



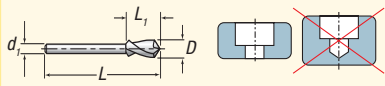
Type	D	d	L	L ₁	L ₂	Shank
01S-MK1	30	7	120	59	16	MT1
01S-10	30	7	88	59	16	Ø10

Size 0



Ø mm	Insert drills			Pilots		Counterbores and countersinks							
	B	LB	BH	F	R	N	NA	W	H	HA	WHV	T	KV
	HSS	HSS	Carbide K20 micrograin	Fixed	Roller	HSS	HSS	HSS	Carbide K40 micrograin	Carbide K10 micrograin	For carbide Inserts	HSS 90°	For carbide Inserts
	Tol.h8 Flute 15 mm	Tol.h8 Flute 27 mm	Tol.h8 Flute 15 mm	Tol. c9	Tol. c9	Tol.p8	Tol.p8	Tol.p8	Tol.p8	Tol.p8	Tol.±0,1	Tol.x9	+0,2 -0
Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
4,0				OF-04,0*									
4,2	OB-04,2*	OLB-04,2*		OF-04,2*									
4,3	OB-04,3*	OLB-04,3*		OF-04,3*									
4,5	OB-04,5*	OLB-04,5*		OF-04,5*									
4,8	OB-04,8*	OLB-04,8*		OF-04,8*									
5,0	OB-05,0*	OLB-05,0*	OBH-05,0*	OF-05,0*									
5,1	OB-05,1*	OLB-05,1*											
5,3	OB-05,3*	OLB-05,3*		OF-05,3*									
5,5	OB-05,5*	OLB-05,5*		OF-05,5*									
5,8	OB-05,8	OLB-05,8		OF-05,8									
6,0	OB-06,0	OLB-06,0	OBH-06,0	OF-06,0	OR-06,0								
6,4	OB-06,4	OLB-06,4		OF-06,4	OR-06,4								
6,5	OB-06,5	OLB-06,5	OBH-06,5	OF-06,5	OR-06,5								
6,6	OB-06,6	OLB-06,6		OF-06,6	OR-06,6								
6,8	OB-06,8	OLB-06,8	OBH-06,8	OF-06,8	OR-06,8								
7,0	OB-07,0	OLB-07,0		OF-07,0	OR-07,0	ON-07,0	ONA-07,0	OW-07,0					
7,4				OF-07,4		ON-07,4	ONA-07,4						
7,5	* Not to be used with carbide cutters.			OF-07,5	OR-07,5	ON-07,5	ONA-07,5	OW-07,5					
7,6				OF-07,6									
8,0				OF-08,0	OR-08,0	ON-08,0	ONA-08,0	OW-08,0				OT9-08,0	
8,3				OF-08,3	OR-08,3							OT9-08,3	
8,4				OF-08,4	OR-08,4								
8,5				OF-08,5	OR-08,5	ON-08,5	ONA-08,5	OW-08,5					
8,6												OT9-08,6	
9,0				OF-09,0	OR-09,0	ON-09,0	ONA-09,0	OW-09,0					
9,4						ON-09,4	ONA-09,4					OT9-09,4	
9,5				OF-09,5	OR-09,5	ON-09,5	ONA-09,5	OW-09,5					
10,0				OF-10,0	OR-10,0	ON-10,0	ONA-10,0	OW-10,0	OH-10,0			OT9-10,0	
10,2				OF-10,2									
10,4						ON-10,4	ONA-10,4	OW-10,4				OT9-10,4	
10,5				OF-10,5	OR-10,5	ON-10,5	ONA-10,5	OW-10,5	OH-10,5	OHA-10,5			
11,0				OF-11,0	OR-11,0	ON-11,0	ONA-11,0	OW-11,0	OH-11,0	OHA-11,0			
11,5				OF-11,5		ON-11,5	ONA-11,5	OW-11,5	OH-11,5	OHA-11,5		OT9-11,5	
12,0				OF-12,0	OR-12,0	ON-12,0	ONA-12,0	OW-12,0	OH-12,0	OHA-12,0		OT9-12,0	
12,4												OT9-12,4	
12,5				OF-12,5	OR-12,5	ON-12,5	ONA-12,5	OW-12,5	OH-12,5	OHA-12,5			
13,0				OF-13,0	OR-13,0	ON-13,0	ONA-13,0	OW-13,0	OH-13,0	OHA-13,0			
13,4												OT9-13,4	
13,5				OF-13,5	OR-13,5	ON-13,5	ONA-13,5			OHA-13,5			
14,0				OF-14,0	OR-14,0	ON-14,0	ONA-14,0	OW-14,0	OH-14,0	OHA-14,0		OT9-14,0	
14,5						ON-14,5	ONA-14,5		OH-14,5	OHA-14,5			
15,0						ON-15,0	ONA-15,0	OW-15,0	OH-15,0	OHA-15,0		OT9-15,0	
15,5						ON-15,5	ONA-15,5	OW-15,5					
16,0						ON-16,0	ONA-16,0	OW-16,0	OH-16,0	OHA-16,0		OT9-16,0	
16,4												OT9-16,4	
16,5								OW-16,5				OT9-16,5	
17,0						ON-17,0	ONA-17,0		OH-17,0	OHA-17,0			
17,5						ON-17,5	ONA-17,5						
18,0						ON-18,0	ONA-18,0		OH-18,0	OHA-18,0	OWHV-18,0		
18,5						ON-18,5	ONA-18,5						
19,0						ON-19,0	ONA-19,0		OH-19,0	OHA-19,0	OWHV-19,0		
19,5						ON-19,5	ONA-19,5						
20,0						ON-20,0	ONA-20,0		OH-20,0	OHA-20,0	OWHV-20,0		
20,5						ON-20,5	ONA-20,5						OKV9-20,5
21,0						ON-21,0	ONA-21,0		OH-21,0	OHA-21,0			
21,5						ON-21,5	ONA-21,5						
22,0						ON-22,0	ONA-22,0		OH-22,0	OHA-22,0			
22,5						ON-22,5	ONA-22,5						
23,0						ON-23,0	ONA-23,0		OH-23,0	OHA-23,0			
23,5							ONA-23,5						
24,0						ON-24,0	ONA-24,0		OH-24,0	OHA-24,0			
25,0													OKV9-25,0

B, LB and BH

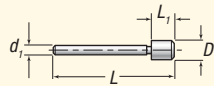


Type	d ₁	L	L ₁	L ₂
B, BH	4,0	70,0	15,0	8,0
LB	4,0	82,0	27,0	8,0

Important!

- It is important to note that when combining insert drills with countersinks, the drill must break through the work piece before secondary cutting commences and must not be used in blind holes.

F and R

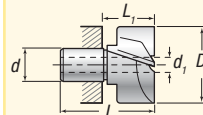


Type	d ₁	L	L ₁
F, R	4,0	64,0	9,0

Important!

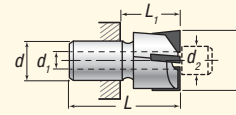
- When working "dry" type R roller pilots must be lubricated.

N, NA and W

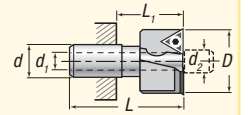


Type	d	d ₁	d _{2min}	L	L ₁
N, NA, W	10,0	4,0		40,0	22,0
H, HA, WH	10,0	4,0	5,8	40,0	22,0
WHV	10,0	4,0	5,2	40,0	22,0

H and HA



WHV



Important!

- The counterbore WHV Rotatip should always be used combined with type R roller pilots.

Size 0



Tool holders

A

Shank	Part No.
MT1	0A-MK1
MT2	0A-MK2
Ø8	0A-08
Ø10	0A-10

Tool holders

NS
Short

Shank	Part No.
Weldon	
W16	ONS-W16

Tool holders

L
Long

Shank	Part No.
MT1	
L100	OL-100-MK1
L150	OL-150-MK1
L200	OL-200-MK1

Tool holders

S
With rotating depthstop

Shank	Part No.
MT1	OS-MK1
Ø10	OS-10



Set

Part No. 0P / M4-M8

Counterbores type N, Ø mm	Pilots type F, Ø mm	Tool holders
8,0	4,5	0A-MK2
9,0	5,0	
10,0	5,5	
11,0	6,0	
12,0	6,5	
13,0	6,6	
14,0	7,0	
15,0	7,5	
	8,0	
	8,6	
	9,0	
	10,0	



Set

Part No. 0D / M4-M12

Counterbores type N, Ø mm	Pilots type F, Ø mm	Tool holders
8,0	4,3	0A-MK2
10,0	4,5	
11,0	5,3	
15,0	5,5	
18,0	6,4	
20,0	6,6	
	8,4	
	9,0	
	10,5	
	11,0	
	13,0	
	13,5	

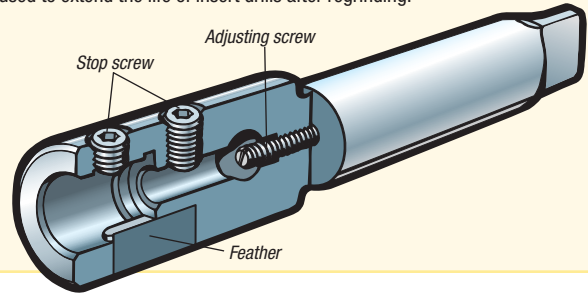
According to DIN 74, Form 1, 2, 3.

Important!

- When using carbide cutters – types TH, H and HA – set the axial adjusting screw to contact the shank of inserted pilot or drill.

Allow a gap between the shoulder of the pilot/drill and the carbide cutting edges to prevent damage by accidental impact.

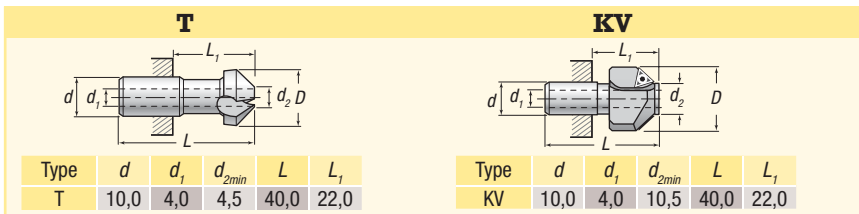
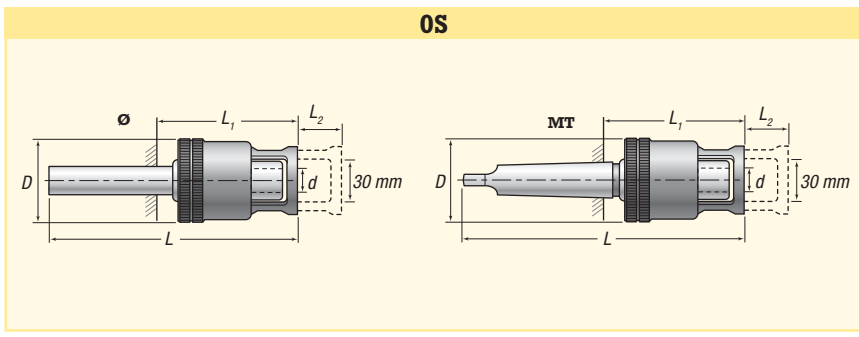
The adjusting screw is also used to extend the life of insert drills after regrinding.



Insert for WHV and KV

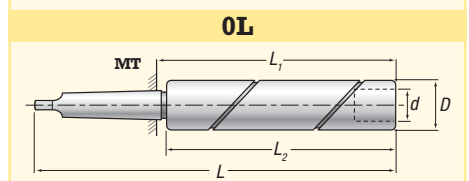
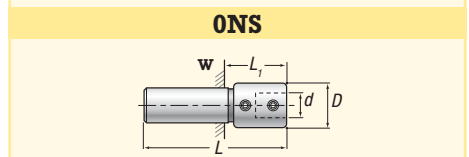
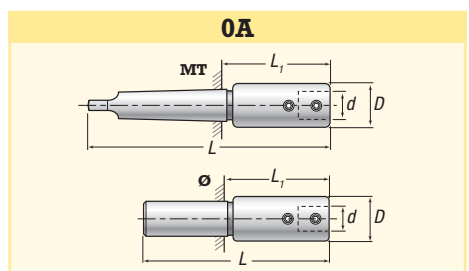
Type of tools D mm	Size of insert	Part No.	Part No.	Radius mm
WHV 18,0 - 20,0 KV 20,0 - 25,0	07	TPMT-07T	TPMR-07T	0,4
	07		TPGR-07T	0,4
	07		TPMR-07H	0,4

- Carbide quality PK40. Al insert are coated in several layers (TiCN-TiC-TiN).
- The GRANLUND inserts have special chipbreaking angel for optimum chip control.



Important!

- The countersinks KV should always be used combined with type R roller pilots.



Type	D Tol. g7	d	L	L ₁	L ₂	Shank
0A-MK1	18	10	110	48		MT1
0A-MK2	18	10	132	57		MT2
0A-08	18	10	92	42		Ø8
0A-10	18	10	92	42		Ø10
OS-MK1	37	10	114	53	18	MT1
OS-10	37	10	96	53	18	Ø10
OL-100-MK1	20	10	168	106	100	MT1
OL-150-MK1	20	10	218	156	150	MT1
OL-200-MK1	20	10	268	206	200	MT1
ONS-W16	18	10	80	28		W16

Size 1



Ø mm	Insert drills			Pilots	
	B	LB	BH	F	R/RS**
	HSS	HSS	Carbide K20 micrograin	Fixed	Roller
	Tol. h8 Flute 25 mm	Tol. h8 Flute 40 mm	Tol. h8 Flute 25 mm	Tol. c9	Tol. c9
	Part No.	Part No.	Part No.	Part No.	Part No.
6,0				1F-06,0*	
6,4				1F-06,4*	
6,5	1B-06,5*	1LB-06,5*	1BH-06,5*	1F-06,5*	
6,6	1B-06,6*	1LB-06,6*		1F-06,6*	
6,8	1B-06,8*	1LB-06,8*	1BH-06,8*	1F-06,8*	
7,0	1B-07,0*	1LB-07,0*	1BH-07,0*	1F-07,0*	1R-07,0*
7,4				1F-07,4*	
7,5	1B-07,5*	1LB-07,5*		1F-07,5*	1R-07,5*
7,6	1B-07,6*	1LB-07,6*		1F-07,6*	
7,9	1B-07,9*	1LB-07,9*			
8,0	1B-08,0	1LB-08,0	1BH-08,0	1F-08,0	1R-08,0
8,2	1B-08,2	1LB-08,2			
8,3				1F-08,3	1R-08,3
8,4	1B-08,4	1LB-08,4		1F-08,4	1R-08,4
8,5	1B-08,5	1LB-08,5	1BH-08,5	1F-08,5	1R-08,5
8,8	1B-08,8	1LB-08,8			
9,0	1B-09,0	1LB-09,0	1BH-09,0	1F-09,0	1R-09,0
9,3	1B-09,3	1LB-09,3			
9,5	1B-09,5	1LB-09,5		1F-09,5	1R-09,5
10,0	1B-10,0	1LB-10,0	1BH-10,0	1F-10,0	1R-10,0
10,2	1B-10,2	1LB-10,2		1F-10,2	1R-10,2
10,5	1B-10,5	1LB-10,5	1BH-10,5	1F-10,5	1R-10,5
10,7	1B-10,7				
11,0	1B-11,0	1LB-11,0	1BH-11,0	1F-11,0	1R-11,0
11,5	1B-11,5	1LB-11,5	1BH-11,5	1F-11,5	1R-11,5
11,6	1B-11,6	1LB-11,6			
12,0	1B-12,0	1LB-12,0	1BH-12,0	1F-12,0	1R-12,0
12,5				1F-12,5	1R-12,5
13,0				1F-13,0	1R-13,0
13,5				1F-13,5	1R-13,5
14,0				1F-14,0	1R-14,0
14,5				1F-14,5	1R-14,5
15,0				1F-15,0	1R-15,0
15,5				1F-15,5	1R-15,5
16,0				1F-16,0	1R-16,0
16,5				1F-16,5	1R-16,5
17,0				1F-17,0	1R-17,0
17,5				1F-17,5	1R-17,5
18,0				1F-18,0	1R-18,0
18,5				1F-18,5	1R-18,5
19,0				1F-19,0	1R-19,0
20,0				1F-20,0	1R-20,0
20,5					1R-20,5
21,0					1R-21,0
21,5					
22,0					1R-22,0
22,5					1R-22,5
23,0					1R-23,0
24,0					1R-24,0

* Not be used with carbide cutters.

Ø mm	Counterbores					
	N	NA	W	H	HA	WHV
	HSS	HSS	HSS	Carbide K40 micrograin	Carbide K10 micrograin	For carbide inserts
	Tol. p8	Tol. p8	Tol. p8	Tol. p8	Tol. p8	Tol. ± 0,1
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
10,0	1N-10,0	1NA-10,0	1W-10,0			
10,4		1NA-10,4				
10,5	1N-10,5	1NA-10,5	1W-10,5			
11,0	1N-11,0	1NA-11,0	1W-11,0			
11,5	1N-11,5	1NA-11,5	1W-11,5			
12,0	1N-12,0	1NA-12,0	1W-12,0	1H-12,0	1HA-12,0	
12,5	1N-12,5	1NA-12,5	1W-12,5	1H-12,5	1HA-12,5	
13,0	1N-13,0	1NA-13,0	1W-13,0	1H-13,0	1HA-13,0	
13,5	1N-13,5	1NA-13,5	1W-13,5	1H-13,5	1HA-13,5	
14,0	1N-14,0	1NA-14,0	1W-14,0	1H-14,0	1HA-14,0	
14,5	1N-14,5	1NA-14,5		1H-14,5	1HA-14,5	
15,0	1N-15,0	1NA-15,0	1W-15,0	1H-15,0	1HA-15,0	
15,5	1N-15,5	1NA-15,5		1H-15,5	1HA-15,5	
16,0	1N-16,0	1NA-16,0	1W-16,0	1H-16,0	1HA-16,0	
16,5	1N-16,5	1NA-16,5	1W-16,5	1H-16,5	1HA-16,5	
17,0	1N-17,0	1NA-17,0	1W-17,0	1H-17,0	1HA-17,0	
17,5	1N-17,5	1NA-17,5	1W-17,5	1H-17,5	1HA-17,5	
18,0	1N-18,0	1NA-18,0	1W-18,0	1H-18,0	1HA-18,0	
18,5	1N-18,5	1NA-18,5		1H-18,5	1HA-18,5	
19,0	1N-19,0	1NA-19,0	1W-19,0	1H-19,0	1HA-19,0	
19,5	1N-19,5	1NA-19,5		1H-19,5	1HA-19,5	
20,0	1N-20,0	1NA-20,0	1W-20,0	1H-20,0	1HA-20,0	1WHV-20,0
20,5	1N-20,5	1NA-20,5		1H-20,5	1HA-20,5	
21,0	1N-21,0	1NA-21,0	1W-21,0	1H-21,0	1HA-21,0	1WHV-21,0
21,5	1N-21,5	1NA-21,5	1W-21,5	1H-21,5	1HA-21,5	
22,0	1N-22,0	1NA-22,0	1W-22,0	1H-22,0	1HA-22,0	1WHV-22,0
22,5	1N-22,5	1NA-22,5		1H-22,5	1HA-22,5	
23,0	1N-23,0	1NA-23,0	1W-23,0	1H-23,0	1HA-23,0	1WHV-23,0
23,5	1N-23,5	1NA-23,5		1H-23,5	1HA-23,5	
24,0	1N-24,0	1NA-24,0	1W-24,0	1H-24,0	1HA-24,0	1WHV-24,0
24,5	1N-24,5	1NA-24,5		1H-24,5	1HA-24,5	
25,0	1N-25,0	1NA-25,0	1W-25,0	1H-25,0	1HA-25,0	1WHV-25,0
25,5	1N-25,5	1NA-25,5		1H-25,5	1HA-25,5	
26,0	1N-26,0	1NA-26,0		1H-26,0	1HA-26,0	1WHV-26,0
26,5	1N-26,5	1NA-26,5		1H-26,5	1HA-26,5	
27,0	1N-27,0	1NA-27,0		1H-27,0	1HA-27,0	1WHV-27,0
27,5	1N-27,5	1NA-27,5		1H-27,5	1HA-27,5	
28,0	1N-28,0	1NA-28,0		1H-28,0	1HA-28,0	1WHV-28,0
28,5	1N-28,5	1NA-28,5		1H-28,5	1HA-28,5	
29,0	1N-29,0	1NA-29,0		1H-29,0	1HA-29,0	1WHV-29,0
29,5		1NA-29,5			1HA-29,5	
30,0	1N-30,0*	1NA-30,0*		1H-30,0*	1HA-30,0*	1WHV-30,0
30,5	1N-30,5*	1NA-30,5*			1HA-30,5*	
31,0	1N-31,0*	1NA-31,0*		1H-31,0*	1HA-31,0*	1WHV-31,0
32,0	1N-32,0*	1NA-32,0*		1H-32,0*	1HA-32,0*	1WHV-32,0
33,0	1N-33,0*	1NA-33,0*		1H-33,0*	1HA-33,0*	
34,0	1N-34,0*	1NA-34,0*		1H-34,0*	1HA-34,0*	1WHV-34,0
35,0	1N-35,0*	1NA-35,0*		1H-35,0*	1HA-35,0*	
36,0	1N-36,0*	1NA-36,0*		1H-36,0*	1HA-36,0*	1WHV-36,0
37,0	1N-37,0*	1NA-37,0*			1HA-37,0*	
38,0	1N-38,0*	1NA-38,0*		1H-38,0*	1HA-38,0*	

B, LB and BH

Type	d ₁	L	L ₁	L ₂
B, BH	6,0	95,0	25,0	13,0
LB	6,0	110,0	40,0	13,0

Important!

- It is important to note that when combining insert drills with countersinks, the drill must break through the work piece before secondary cutting commences and must not be used in blind holes.

F and R/RS

Type	d ₁	L	L ₁
F, R	6,0	80,0	14,0

Important!

- When working "dry" type R roller pilots must be lubricated.
- Pilots type RS must be combined with holders type AS.

N, NA and W

Type	d	d ₁	d _{2min}	L	L ₁
N, NA, W	14,0	6,0		48,0	28,0

Important!

- Counterbores N, NA, H and HA Ø 30 mm and larger are all made with a driving lip. These sizes should be used in the appropriate type M toolholder.

H and HA

Type	d	d ₁	L
H, HA, WH	14,0	6,0	8,0

WHV

Type	d	d ₁	d _{2min}	L	L ₁
WHV	14,0	6,0	7,6	48,0	28,0

Important!

- The counterbore WHV Rotatip should always be used combined with type R or RS, roller pilots. The shank of the holder must not be smaller than MT2. The minimum size of the pilot shall be Ø 11 mm for counterboring and Ø 6 mm for spotfacing.



Size 1



Ø mm	Countersinks					
	T	T	T	TH	TK	KV
	HSS	HSS	HSS	Carbide K 10	HSS	For carbide inserts
	Tol. x9 60°	Tol. x9 80°	Tol. x9 90°	Tol. x9 90°	Tol. x9 90°	Tol. + 0,2-0 90°
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
11,5			1T9-11,5			
12,0			1T9-12,0			
12,4			1T9-12,4			
13,4			1T9-13,4			
14,0	1T6-14,0	1T8-14,0	1T9-14,0			
15,0			1T9-15,0			
16,0	1T6-16,0		1T9-16,0			
16,4			1T9-16,4			
16,5			1T9-16,5		1TK9-16,5	
18,0	1T6-18,0		1T9-18,0			
19,0			1T9-19,0			
20,0	1T6-20,0		1T9-20,0	1TH9-20,0	1TK9-20,0	
20,5			1T9-20,5			
22,0			1T9-22,0			
23,0			1T9-23,0			
25,0	1T6-25,0	1T8-25,0	1T9-25,0		1TK9-25,0	
26,0			1T9-26,0			1KV9-26,0
28,0			1T9-28,0			
30,0	1T6-30,0	1T8-30,0	1T9-30,0	1TH9-30,0	1TK9-30,0	1KV9-30,0
34,0				1TK9-34,0		



GRANLUND Tools

Tool holders		Tool holders		Tool holders	
A		NS Short		L Long	
Shank	Part No.	Shank	Part No.	Shank	Part No.
MT1	1A-MK1	MT2	1NS-MK2	MT2	1L-100-MK2
MT2	1A-MK2	MT3	1NS-MK3	MT2	1L-150-MK2
MT3	1A-MK3	Weldon	1NS-W20	MT2	1L-225-MK2
Ø10	1A-10			Ø20	1L-500-20
Ø12	1A-12				
Weldon	1A-W20				

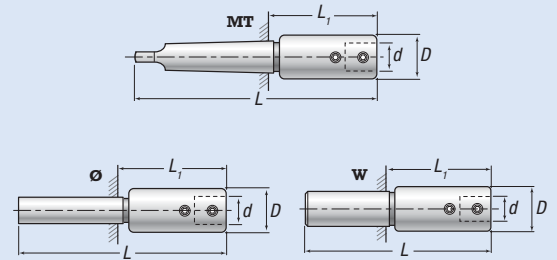
Important!

- When using carbide cutters – types TH, H and HA – set the axial adjusting screw to contact the shank of inserted pilot or drill.
- Allow a gap between the shoulder of the pilot/drill and the carbide cutting edges to prevent damage by accidental impact.
- The adjusting screw is also used to extend the life of insert drills after regrinding.

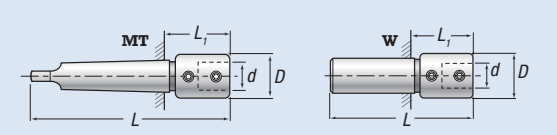
Insert for WHV and KV				
Type of insert				
Type of tools D mm	Size of insert	Part No.	Part No.	Radius mm
WHV 20,0 - 25,0	07	TPMT-07T	TPMR-07T	0,4
	07		TPGR-07T	0,4
	07		TPMR-07H	0,4
WHV >25,0 - 33,0 KV >26,0 - 30,0	10	TPMT-10T	TPMR-10T	0,4
	10		TPGR-10T	0,4
	10		TPMR-10H	0,4
WHV >34,0 - 36,0	12	TPMT-12T	TPMR-12T	0,8
	12		TPGR-12T	0,8
	12		TPMR-12H	0,8

- Carbide quality PK40. All inserts are coated in several layers (TiCN-TiC-TiN).
- The GRANLUND inserts have special chipbreaking angel for optimum chip control.

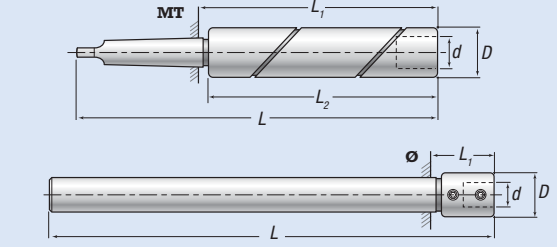
1A



1NS

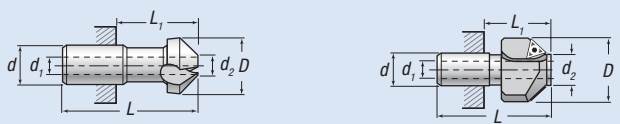


1L



Type	D Tol. g7	d	L	L ₁	L ₂	Shank
1A-MK1	24	14	123	62		MT1
1A-MK2	24	14	137	62		MT2
1A-MK3	24	14	160	66		MT3
1A-10	24	14	110	55		Ø10
1A-12	24	14	120	55		Ø12
1A-W20	24	14	110	55		W20
1NS-MK2	24	14	112	37		MT2
1NS-MK3	24	14	130	37		MT3
1NS-W20	24	14	86	32		W20
1L-L100-MK2	26	14	183	108	100	MT2
1L-L150-MK2	26	14	233	158	150	MT2
1L-L225-MK2	26	14	308	233	225	MT2
1L-500-20	24	14	500	37		Ø20

T, TH and TK KV



Type	d	d ₁	d _{2min}	L	L ₁	Type	d	d ₁	d _{2min}	L	L ₁
T	14,0	6,0	6,6	48,0	28,0	KV (Ø26)	14,0	6,0	13,0	48,0	28,0
TH	14,0	6,0	10,0	48,0	28,0	KV (Ø30)	14,0	6,0	13,8	48,0	28,0
TK	14,0	6,0	4,0	48,0	28,0						

- Important!**
- The countersink KV conotip should always be used combined with type R or RS, roller pilots. Minimum shank size is MT3.

Size 1

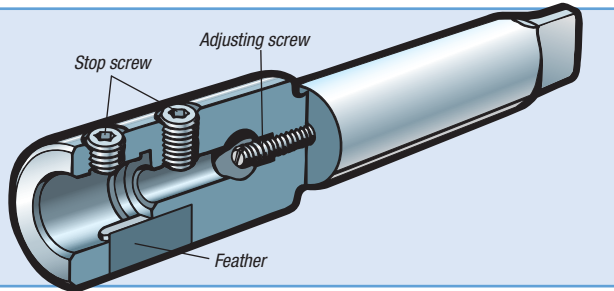


Tool holders		Tool holders		Tool holders	
GS/AS* With through coolant		S With rotating depthstop		M Slotted drive	
Shank	Part No.	Shank	Part No.	Shank	Part No.
MT3	1GS-MK3	MT2	1S-MK2	MT3	1M-MK3
Weldon	1GS-W25	Ø10	1S-10	W25	1M-W25
Weldon	1AS-W20				

* Holders type AS must be combined with Pilots type RS.



Set		
Part No. 1P / M8-M14		
Counterbores type N, Ø mm	Pilots type F, Ø mm	Tool holders
14,0	8,0	1A-MK2
15,0	8,5	
16,0	9,0	
17,0	9,5	
18,0	10,0	
20,0	10,5	
22,0	11,0	
24,0	11,5	
	12,0	
	12,5	
	13,0	
	13,5	
	14,0	
	14,5	
	15,0	
	15,5	
	16,0	



Set		
Part No. 1D / M8-M16		
Counterbores type N, Ø mm	Pilots type F, Ø mm	Tool holders
15,0	8,4	1A-MK2
18,0	9,0	
20,0	10,5	
24,0	11,0	
26,0	13,0	
	13,5	
	15,0	
	15,5	
	17,0	
	17,5	

According to DIN 74, Form 1, 2, 3

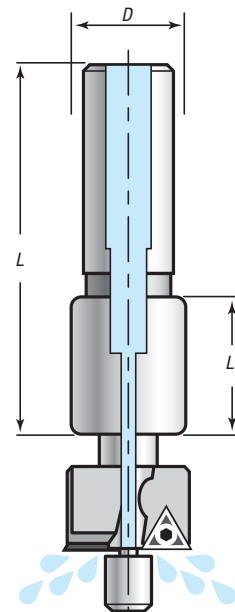
1S

1GS

1M

1M-W25

Type	D Tol. g7	d	L	L ₁	L ₂	Shank
1S-MK2	45	14	144	70	20	MT2
1S-10	45	14	128	70	20	Ø10
1GS-MK3	36	14	143	50		MT3
1GS-W25	36	14	105	40		W25
1M-MK3	28	14	166	72		M3
1M-W25	28	14	122	66		W25
1AS-W20	24	14	86	36		W20



Internal cooling

Holder type AS in combination with pilot type RS.

Size 2



Ø mm	Insert drills			Pilots	
	B	LB	BH	F	R/RS**
	HSS	HSS	Carbide K20 micrograin	Fixed	Roller
	Tol.h8 Flute 30 mm	Tol.h8 Flute 50 mm	Tol.h8 Flute 40 mm	Tol. c9	Tol. c9
	Part No.	Part No.	Part No.	Part No.	Part No.
10,0	* Not to be used with carbide cutters.			2F-10,0*	2R-10,0*
10,2				2F-10,2*	2R-10,2*
10,5				2F-10,5*	2R-10,5*
11,0	2B-11,0*	2LB-11,0*	2BH-11,0*	2F-11,0*	2R-11,0*
11,5	2B-11,5*	2LB-11,5*	2BH-11,5*	2F-11,5*	2R-11,5*
11,6	2B-11,6*				
12,0	2B-12,0	2LB-12,0	2BH-12,0	2F-12,0	2R-12,0
12,2	2B-12,2				
12,5	2B-12,5	2LB-12,5	2BH-12,5	2F-12,5	2R-12,5
13,0	2B-13,0	2LB-13,0	2BH-13,0	2F-13,0	2R-13,0
13,5	2B-13,5	2LB-13,5	2BH-13,5	2F-13,5	2R-13,5
14,0	2B-14,0	2LB-14,0	2BH-14,0	2F-14,0	2R-14,0
14,5	2B-14,5	2LB-14,5	2BH-14,5	2F-14,5	2R-14,5
15,0	2B-15,0	2LB-15,0	2BH-15,0	2F-15,0	2R-15,0
15,1	2B-15,1				
15,5	2B-15,5	2LB-15,5	2BH-15,5	2F-15,5	2R-15,5
16,0	2B-16,0	2LB-16,0	2BH-16,0	2F-16,0	2R-16,0
16,5	2B-16,5	2LB-16,5	2BH-16,5	2F-16,5	2R-16,5
17,0	2B-17,0	2LB-17,0	2BH-17,0	2F-17,0	2R-17,0
17,5	2B-17,5	2LB-17,5		2F-17,5	2R-17,5
18,0	2B-18,0	2LB-18,0	2BH-18,0	2F-18,0	2R-18,0
18,5	2B-18,5	2LB-18,5		2F-18,5	2R-18,5
19,0	2B-19,0	2LB-19,0	2BH-19,0	2F-19,0	2R-19,0
19,5	2B-19,5			2F-19,5	2R-19,5
20,0	2B-20,0	2LB-20,0	2BH-20,0	2F-20,0	2R-20,0
20,5				2F-20,5	2R-20,5
21,0	2B-21,0	2LB-21,0	2BH-21,0	2F-21,0	2R-21,0
21,5				2F-21,5	2R-21,5
22,0	2B-22,0	2LB-22,0		2F-22,0	2R-22,0
22,5				2F-22,5	2R-22,5
23,0	2B-23,0			2F-23,0	2R-23,0
23,5				2F-23,5	
24,0	2B-24,0			2F-24,0	2R-24,0
24,5				2F-24,5	2R-24,5
25,0	2B-25,0	2LB-25,0		2F-25,0	2R-25,0
25,5				2F-25,5	2R-25,5
26,0				2F-26,0	2R-26,0
26,5				2F-26,5	2R-26,5
27,0				2F-27,0	2R-27,0
27,5				2R-27,5	
28,0				2F-28,0	2R-28,0
29,0				2F-29,0	2R-29,0
30,0				2F-30,0	2R-30,0
30,5					2R-30,5
31,0					2R-31,0
32,0					2R-32,0
33,0					2R-33,0
34,0					2R-34,0
35,0					2R-35,0
36,0					2R-36,0
37,0					2R-37,0
38,0					2R-38,0
39,0					2R-39,0
40,0					2R-40,0
42,0					2R-42,0
44,0					2R-44,0
45,0					2R-45,0
46,0					2R-46,0
48,0					2R-48,0
50,0					2R-50,0

B, LB and BH

Type	d ₁	L	L ₁	L ₂
B, BH	10,0	125,0	30,0	15,0
LB	10,0	145,0	50,0	15,0

Important!

- It is important to note that when combining insert drills with countersinks, the drill must break through the work piece before secondary cutting commences and must not be used in blind holes.

F and R/RS

Type	d ₁	L	L ₁
F, R	10,0	110,0	20,0

Important!

- When working "dry" type R roller pilots must be lubricated.
- Pilots type RS must be combined with holders type AS.

Ø mm	Counterbores					
	N	NA	W	H	HA	WHV
	HSS	HSS	HSS	Carbide K40 micrograin	Carbide K10 micrograin	For carbide inserts
	Tol. p8	Tol. p8	Tol. p8	Tol. p8	Tol. p8	Tol. ± 0,1
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
16,0	2N-16,0	2NA-16,0	2W-16,0			
16,5		2NA-16,5				
17,0	2N-17,0	2NA-17,0				
17,5	2N-17,5	2NA-17,5				
18,0	2N-18,0	2NA-18,0	2W-18,0	2H-18,0	2HA-18,0	
18,5	2N-18,5	2NA-18,5				
19,0	2N-19,0	2NA-19,0	2W-19,0	2H-19,0	2HA-19,0	
19,5	2N-19,5	2NA-19,5				
20,0	2N-20,0	2NA-20,0	2W-20,0	2H-20,0	2HA-20,0	
20,5	2N-20,5	2NA-20,5				
21,0	2N-21,0	2NA-21,0		2H-21,0	2HA-21,0	
21,5	2N-21,5	2NA-21,5				
22,0	2N-22,0	2NA-22,0	2W-22,0	2H-22,0	2HA-22,0	
22,5		2NA-22,5				
23,0	2N-23,0	2NA-23,0	2W-23,0	2H-23,0	2HA-23,0	
23,5	2N-23,5	2NA-23,5				
24,0	2N-24,0	2NA-24,0	2W-24,0	2H-24,0	2HA-24,0	
24,5	2N-24,5	2NA-24,5				
25,0	2N-25,0	2NA-25,0	2W-25,0	2H-25,0	2HA-25,0	
25,5	2N-25,5	2NA-25,5				
26,0	2N-26,0	2NA-26,0				
26,5	2N-26,5	2NA-26,5	2W-26,0	2H-26,0	2HA-26,0	
27,0	2N-27,0	2NA-27,0				
27,5	2N-27,5	2NA-27,5	2W-27,0	2H-27,0	2HA-27,0	
28,0	2N-28,0	2NA-28,0				
28,5	2N-28,5	2NA-28,5	2W-28,0	2H-28,0	2HA-28,0	
29,0	2N-29,0	2NA-29,0				
29,5		2NA-29,5	2W-29,0	2H-29,0	2HA-29,0	
30,0	2N-30,0	2NA-30,0	2W-30,0	2H-30,0	2HA-30,0	
30,5	2N-30,5	2NA-30,5				
31,0	2N-31,0	2NA-31,0	2W-31,0	2H-31,0	2HA-31,0	
32,0	2N-32,0	2NA-32,0	2W-32,0	2H-32,0	2HA-32,0	
33,0	2N-33,0	2NA-33,0	2W-33,0	2H-33,0	2HA-33,0	
34,0	2N-34,0	2NA-34,0	2W-34,0	2H-34,0	2HA-34,0	2WHV-34,0
35,0	2N-35,0	2NA-35,0	2W-35,0	2H-35,0	2HA-35,0	2WHV-35,0
36,0	2N-36,0	2NA-36,0	2W-36,0	2H-36,0	2HA-36,0	2WHV-36,0
37,0	2N-37,0	2NA-37,0		2H-37,0	2HA-37,0	2WHV-37,0
38,0	2N-38,0	2NA-38,0	2W-38,0	2H-38,0	2HA-38,0	2WHV-38,0
39,0	2N-39,0	2NA-39,0		2H-39,0	2HA-39,0	2WHV-39,0
40,0	2N-40,0	2NA-40,0	2W-40,0	2H-40,0	2HA-40,0	2WHV-40,0
41,0	2N-41,0	2NA-41,0		2H-41,0	2HA-41,0	2WHV-41,0
42,0	2N-42,0	2NA-42,0		2H-42,0	2HA-42,0	2WHV-42,0
43,0	2N-43,0	2NA-43,0		2H-43,0	2HA-43,0	2WHV-43,0
44,0	2N-44,0	2NA-44,0		2H-44,0	2HA-44,0	2WHV-44,0
45,0	2N-45,0	2NA-45,0		2H-45,0	2HA-45,0	2WHV-45,0
46,0	2N-46,0	2NA-46,0		2H-46,0	2HA-46,0	2WHV-46,0
47,0	2N-47,0	2NA-47,0			2HA-47,0	2WHV-47,0
48,0	2N-48,0	2NA-48,0		2H-48,0	2HA-48,0	2WHV-48,0
48,0	2N-49,0	2NA-49,0			2HA-49,0	2WHV-49,0
50,0	2N-50,0*	2NA-50,0*		2H-50,0*	2HA-50,0*	2WHV-50,0**
51,0	2N-51,0*	2NA-51,0*			2HA-51,0*	2WHV-51,0**
52,0	2N-52,0*	2NA-52,0*		2H-52,0*	2HA-52,0*	2WHV-52,0**
53,0	2N-53,0*	2NA-53,0*		2H-53,0*	2HA-53,0*	2WHV-53,0**
54,0	2N-54,0*	2NA-54,0*		2H-54,0*	2HA-54,0*	2WHV-54,0**
55,0	2N-55,0*	2NA-55,0*		2H-55,0*	2HA-55,0*	2WHV-55,0**
56,0	2N-56,0*	2NA-56,0*		2H-56,0*	2HA-56,0*	2WHV-56,0**
57,0	2N-57,0*	2NA-57,0*			2HA-57,0*	
58,0	2N-58,0*	2NA-58,0*		2H-58,0*	2HA-58,0*	2WHV-58,0**
60,0	2N-60,0*	2NA-60,0*		2H-60,0*	2HA-60,0*	2WHV-60,0**
62,0	2N-62,0*	2NA-62,0*		2H-62,0*	2HA-62,0*	2WHV-62,0**
64,0	2N-64,0*	2NA-64,0*			2HA-64,0*	2WHV-64,0**
65,0	2N-65,0*	2NA-65,0*		2H-65,0*	2HA-65,0*	2WHV-65,0**
66,0	2N-66,0*	2NA-66,0*		2H-66,0*	2HA-66,0*	
68,0		2NA-68,0*			2HA-68,0*	2WHV-68,0**
70,0	2N-70,0*	2NA-70,0*		2H-70,0*	2HA-70,0*	2WHV-70,0**
72,0	2N-72,0*	2NA-72,0*		2H-72,0*	2HA-72,0*	2WHV-72,0**
74,0		2NA-74,0*			2HA-74,0*	
75,0	2N-75,0*	2NA-75,0*		2H-75,0*	2HA-75,0*	2WHV-75,0**
76,0	2N-76,0*	2NA-76,0*				
78,0		2NA-78,0*				
80,0	2N-80,0*	2NA-80,0*				
82,0	2N-82,0*	2NA-82,0*				
84,0		2NA-84,0*				
85,0	2N-85,0*	2NA-85,0*				

* Use holders type M.
 ** Recommended minimum shank size MT3.



Size 2

GRANLUND
Tools



Ø mm	Countersinks						
	T	T	T	TH	TK	KV	KV
	HSS Tol. x9 60° Part No.	HSS Tol. x9 80° Part No.	HSS Tol. x9 90° Part No.	Carbide K 10 Tol. x9 90° Part No.	HSS Tol. x9 90° Part No.	For carbide inserts Tol. + 0,2-0 60° Part No.	For carbide inserts Tol. + 0,2-0 90° Part No.
20,0	2T6-20,0		2T9-20,0				
22,0			2T9-22,0				
25,0	2T6-25,0		2T9-25,0				
28,0			2T9-28,0				
30,0	2T6-30,0	2T8-30,0	2T9-30,0		2TK9-30,0		
31,0			2T9-31,0				
32,0							2KV9-32,0
32,4			2T9-32,4				
34,0			2T9-34,0				
35,0	2T6-35,0		2T9-35,0				
36,0							
37,0			2T9-37,0		2TK9-37,0		
38,0							2KV9-38,0
39,0							
40,0	2T6-40,0	2T8-40,0	2T9-40,0	2TH9-40,0	2TK9-40,0		2KV9-40,0
41,0						2KV6-41,0	
42,0							
43,0							
44,0							
45,0			2T9-45,0		2TK9-45,0		
46,0							
47,0							
48,0							
48,0							
50,0	2T6-50,0		2T9-50,0	2TH9-50,0	2TK9-50,0		
51,0							2KV9-50,0
52,0							
53,0							
55,0							
56,0							
58,0							
60,0	2T6-60,0		2T9-60,0	2TH9-60,0	2TK9-60,0		2KV9-60,0
62,0							
64,0							
65,0							
68,0							
70,0							
72,0							
75,0			2T9-75,0		2TK9-75,0		
85,0			2T9-85,0				

Tool holders

A

Shank	Part No.
MT2	2A-MK2
MT3	2A-MK3
MT4	2A-MK4
MT5	2A-MK5
Weldon	2A-W20

Tool holders

NS Short

Shank	Part No.
MT3	2NS-MK3
MT4	2NS-MK4
Weldon	2NS-W25

Tool holders

L Long

Shank	Part No.
MT3	2L-175-MK3
MT3	2L-250-MK3
Ø32	2L-500-32

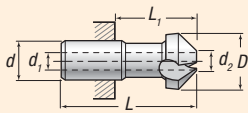
2A

2NS

2L

Type	D Tol. g7	d	L	L ₁	L ₂	Shank
2A-MK2	36	22	160	85		MT2
2A-MK3	36	22	180	87		MT3
2A-MK4	36	22	206	89		MT4
2A-MK5	36	22	240	91		MT5
2A-W20	36	22	140	71		W20
2NS-MK3	36	22	145	51		MT3
2NS-MK4	36	22	170	53		MT4
2NS-W25	36	22	105	45		W25
2L-L175-MK3	40	22	280	186	175	MT3
2L-L250-MK3	40	22	355	261	250	MT3
2L-500-32	36	22	500	51		Ø32

T, TH and TK

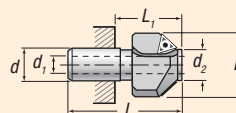


Important!

- Countersinks TH, TK, T Ø 50 are made with a driving lip. These sizes should be used in the appropriate type M holder.

Type	d	d ₁	d _{2min}	L	L ₁
T (-Ø50)	22,0	10,0	10,8	61,0	33,0
T (Ø60)	22,0	10,0	22,0	61,0	33,0
T (-Ø70)	22,0	10,0	37,0	61,0	33,0
T (Ø85)	22,0	10,0	44,0	61,0	33,0
TH (Ø40)	22,0	10,0	14,0	61,0	33,0
TH (Ø50)	22,0	10,0	14,0	61,0	33,0
TH (Ø60)	22,0	10,0	22,0	61,0	33,0
TK (Ø30,37)	22,0		5,0	61,0	33,0
TK (Ø40,45)	22,0		8,0	61,0	33,0
TK (Ø50-)	22,0		10,0	61,5	33,0
TK (Ø60)	22,0		13,0	65,0	33,0
TK (-Ø75)	22,0		25,0	67,0	33,0

KV



Important!

- The countersink KV conotip should always be used combined with type R or RS, roller pilots. Minimum shank size is MT3.

Type	d	d ₁	d _{2min}	L	L ₁
KV (Ø32)	22,0	10,0	17,0	61,0	33,0
KV (Ø38)	22,0	10,0	20,0	61,0	33,0
KV (Ø40)	22,0	10,0	18,0	61,0	33,0
KV (Ø41)	22,0	10,0	24,0	61,0	33,0
KV (Ø50,60)	22,0	10,0	22,0	61,0	33,0

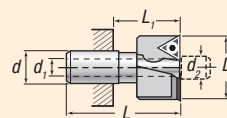
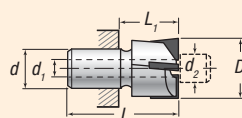
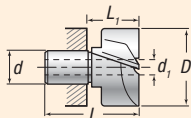
N, NA and W

H and HA

WHV

Important!

- Counterbores N, NA, H and HA Ø 50 mm and larger are all made with a driving lip. These sizes should be used in the appropriate type M toolholder.



Type	d	d ₁	d _{2min}	L	L ₁
N, NA, W	22,0	10,0		61,0	33,0
H, HA, WH	22,0	10,0	12,0	61,0	33,0

Type	d	d ₁	d _{2min}	L	L ₁
WHV 34-45	22,0	10,0	14,8*	61,0	33,0
WHV 46-75	22,0	10,0	15,5*	61,0	33,0
WHV 75	22,0	10,0	17,0*	61,0	33,0

Important!

- The counterbore WHV Rota-tip should always be used combined with type R or RS, roller pilots. The shank of the holder must not be smaller than MT3.

Size 2



Tool holders

GS/AS*
With through coolant

Shank	Part No.
MT3	2GS-MK3
Weldon	2GS-W25
Weldon	2AS-W25

Tool holders

S
With rotating depthstop

Shank	Part No.
MT3	2S-MK3

Tool holders

M
Slotted drive

Shank	Part No.
MT3	2M-MK3
MT4	2M-MK4
W32	2M-W32

* Holders type AS must be combined with Pilot type RS.

Insert for WHV and KV

Type of tools D mm	Size of insert	Part No.	Part No.	Radius mm
KV >32,0 - 40,0	10	TPMT-10T	TPMR-10T	0,4
	10		TPGR-10T	0,4
	10		TPMR-10H	0,4
WHV >34,0 - 45,0	12	TPMT-12T	TPMR-12T	0,8
	12		TPGR-12T	0,8
	12		TPMR-12H	0,8
WHV >46,0 - KV >41,0-60,0	17	TPMT-17T		0,8
	17	TPMT-17H		0,8

- Carbide quality PK40. All inserts are coated in several layers (TiCN-TiC-TiN).
- The GRANLUND inserts have special chipbreaking angel for optimum chip control.

2S

2GS

2M

2M-W32

Type	D Tol. g7	d	L	L ₁	L ₂	Shank
2S-MK3	63	22	187	94	25	MT3
2GS-MK3	44	22	154	61		MT3
2GS-W25	44	22	115	51		W25
2M-MK3	48	22	187	93		MT3
2M-MK4	48	22	212	95		MT4
2M-W32	48	22	148	88		W32
2AS-W25	35	22	105	49		W25



Set

Part No. 2P / M14-M24

Counterbores type N, Ø mm	Pilots type F, Ø mm	Tool holders
24,0	13,0	2A-MK3
26,0	14,0	
28,0	15,0	
30,0	16,0	
32,0	17,0	
33,0	18,0	
34,0	19,0	
36,0	20,0	
40,0	21,0	
	22,0	
	23,0	
	24,0	
	25,0	
	26,0	

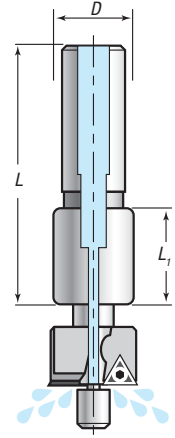


Set

Part No. 2D / M14-M24

Counterbores type N, Ø mm	Pilots type F, Ø mm	Tool holders
24,0	15,0	2A-MK3
26,0	15,5	
30,0	17,0	
33,0	17,5	
36,0	19,0	
40,0	20,0	
	21,0	
	22,0	
	23,0	
	24,0	
	25,0	
	26,0	

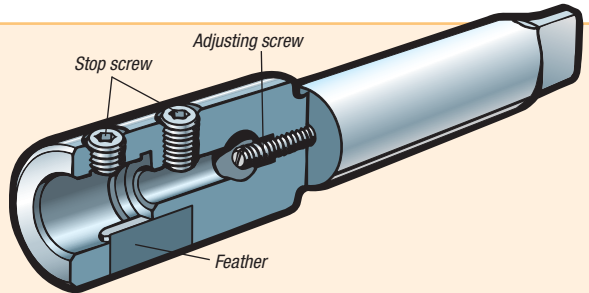
According to DIN 74, Form 1, 2, 3.



Internal cooling
Holder type AS in combination with pilot type RS.

Important!

- When using carbide cutters – types TH, H and HA – set the axial adjusting screw to contact the shank of inserted pilot or drill. Allow a gap between the shoulder of the pilot/drill and the carbide cutting edges to prevent damage by accidental impact. The adjusting screw is also used to extend the life of insert drills after regrinding.



CNC Tools, measurements and dimensions



FA, FAH Boring Tool							
D mm	Part No.	d ₁	L	L ₁	d	No. of inserts/ Size	
9,8	FA-09,8	9,3	85	20	8	1x06	
10,8	FA-10,8	10,3	95	20	10	1x06	
11,8	FA-11,8	11,3	100	25	10	1x06	
12,8	FA-12,8	12,3	105	30	10	1x06	
13,8	FA-13,8	13,3	110	35	10	1x06	
14,8	FA-14,8	14,3	120	30	12	1x06	
15,8	FA-15,8	15,3	125	35	12	1x06	
16,8	FA-16,8	15,8	133	30	16	1x06	
17,8	FA-17,8	16,8	138	35	16	1x06	
18,8	FA-18,8	17,8	143	40	16	1x06	
19,8	FA-19,8	18,8	148	45	16	1x06	
20,8	FA-20,8	19,8	153	50	16	1x06	
21,8	FA-21,8	20,8	158	55	16	1x06	
22,8	FA-22,8	21,0	165	41	20	1x06	
23,8	FA-23,8	22,0	170	46	20	1x06	
24,8	FA-24,8	23,0	175	51	20	1x06	
25,8	FA-25,8	24,0	180	56	20	1x06	
26,8	FA-26,8	25,0	185	41	20	1x06	
27,8	FA-27,8	26,0	190	46	20	1x06	
28,8	FA-28,8	27,0	195	51	20	1x06	
29,8	FA-29,8	28,0	195	51	20	1x06	
30,8	FA-30,8	29,0	195	51	20	1x06	
31,8	FA-31,8	30,0	195	51	20	1x06	
9,8	FAH-09,8	9,3	105	20	8	1x06	
10,8	FAH-10,8	10,3	105	20	8	1x06	
11,8	FAH-11,8	11,3	125	20	10	1x06	
12,8	FAH-12,8	12,3	125	20	10	1x06	
13,8	FAH-13,8	13,3	125	20	10	1x06	
14,8	FAH-14,8	14,3	140	20	12	1x06	
15,8	FAH-15,8	15,3	140	20	12	1x06	
16,8	FAH-16,8	16,3	150	30	12	1x06	
17,8	FAH-17,8	16,8	160	40	16	1x06	
18,8	FAH-18,8	17,8	160	40	16	1x06	
19,8	FAH-19,8	18,8	180	40	16	1x06	
20,8	FAH-20,8	19,8	180	40	16	1x06	
21,8	FAH-21,8	20,8	180	40	16	1x06	
22,8	FAH-22,8	21,0	195	40	20	1x06	
23,8	FAH-23,8	22,0	195	40	20	1x06	
24,8	FAH-24,8	23,0	210	40	20	1x06	
25,8	FAH-25,8	24,0	210	40	20	1x06	
26,8	FAH-26,8	25,0	210	40	20	1x06	
27,8	FAH-27,8	26,0	225	40	20	1x06	
28,8	FAH-28,8	27,0	225	40	20	1x06	
29,8	FAH-29,8	28,0	225	40	20	1x06	
30,8	FAH-30,8	29,0	225	40	20	1x06	
31,8	FAH-31,8	30,0	225	40	20	1x06	



F AE Boring and Chamfering Tool							
D mm	Part No.	d ₁	L	L ₁	F _{max}	d	No. of inserts/ Size
9,8	F AE-09,8	9,3	105	20	0,6	8	1x06
10,8	F AE-10,8	10,3	105	20	1,1	8	1x06
11,8	F AE-11,8	11,3	125	20	0,6	10	1x06
12,8	F AE-12,8	12,3	125	20	1,1	10	1x06
13,8	F AE-13,8	13,3	125	20	1,6	10	1x06
14,8	F AE-14,8	14,3	140	20	1,1	12	1x06
15,8	F AE-15,8	15,3	140	20	1,6	12	1x06
16,8	F AE-16,8	16,3	150	30	2,1	12	1x06
17,8	F AE-17,8	16,8	160	40	0,6	16	1x06
18,8	F AE-18,8	17,8	160	40	1,1	16	1x06
19,8	F AE-19,8	18,8	180	40	1,6	16	1x06
20,8	F AE-20,8	19,8	180	40	2,1	16	1x06
21,8	F AE-21,8	20,8	180	40	2,1	16	1x06
22,8	F AE-22,8	21,0	195	40	1,1	20	1x06
23,8	F AE-23,8	22,0	195	40	1,6	20	1x06
24,8	F AE-24,8	23,0	210	40	2,1	20	1x06
25,8	F AE-25,8	24,0	210	40	2,1	20	1x06
26,8	F AE-26,8	25,0	210	40	2,1	20	1x06
27,8	F AE-27,8	26,0	225	40	2,1	20	1x06
28,8	F AE-28,8	27,0	225	40	2,1	20	1x06
29,8	F AE-29,8	28,0	225	40	2,1	20	1x06
30,8	F AE-30,8	29,0	225	40	2,1	20	1x06
31,8	F AE-31,8	30,0	225	40	2,1	20	1x06

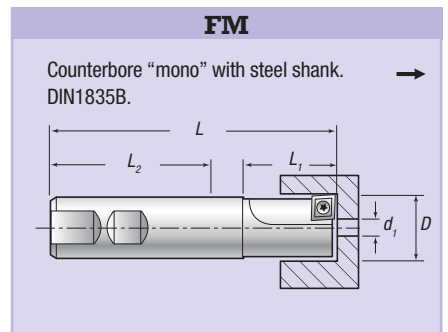
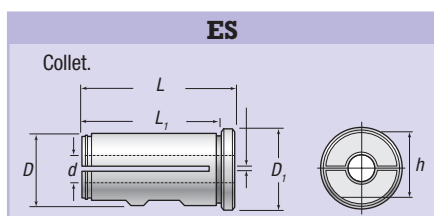
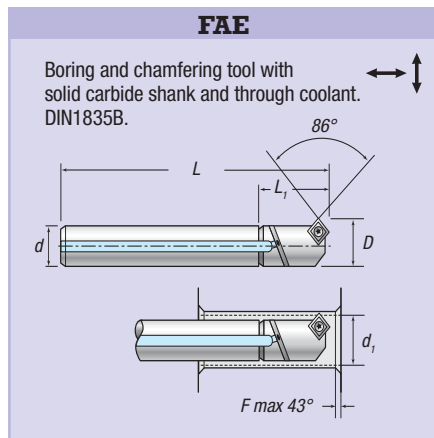
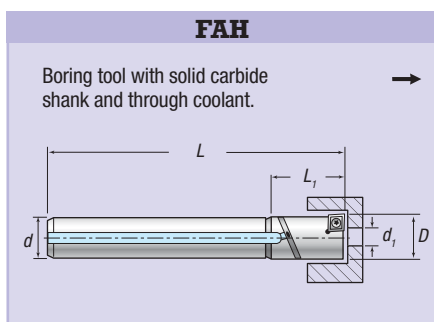
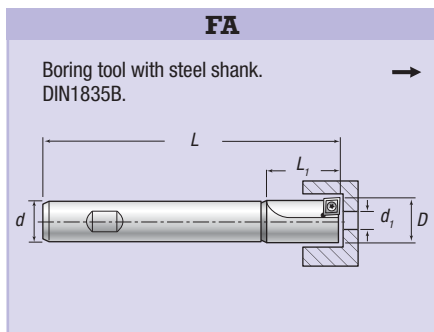


FM Counterbore							
D mm	Part No.	d ₁	L	L ₁	L ₂	Weldon	No. of inserts/ Size
10,0	FM-10	4,0	80	23	45	12	1x06
11,0	FM-11	4,0	80	23	45	12	1x06
12,0	FM-12	4,0	80	26	45	12	1x06
13,0	FM-13	5,0	80	26	45	12	1x06
14,0	FM-14	5,0	80	26	45	12	1x06
15,0	FM-15	5,0	80	26	45	12	1x06
16,0	FM-16	5,0	90	31	48	16	1x06
17,0	FM-17	6,0	90	31	48	16	1x06
18,0	FM-18	8,0	90	31	48	16	1x06
19,0	FM-19	8,0	90	31	48	16	1x06
20,0	FM-20	5,0	100	36	50	20	1x09
21,0	FM-21	5,0	100	36	50	20	1x09
22,0	FM-22	6,0	100	36	50	20	1x09
23,0	FM-23	6,0	100	36	50	20	1x09
24,0	FM-24	8,0	100	36	50	20	1x09
25,0	FM-25	8,0	120	43	56	25	1x09
26,0	FM-26	10,0	120	43	56	25	1x09



ES Collet						
D mm	Part No.	d	L	L ₁	D ₁	h
25,0	ES-25-08	8	61	56	29	23
25,0	ES-25-10	10	61	56	29	23
25,0	ES-25-12	12	61	56	29	23
25,0	ES-25-16	16	61	56	29	23
32,0	ES-32-08	8	65	60	36	30
32,0	ES-32-10	10	65	60	36	30
32,0	ES-32-12	12	65	60	36	30
32,0	ES-32-16	16	65	60	36	30
32,0	ES-32-20	20	65	60	36	30
32,0	ES-32-25	25	65	60	36	30

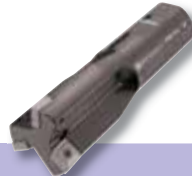
With ES to FA, FAH and F AE the diameter (D) can be adjusted ± 0,5 mm.



CNC Tools, measurements and dimensions



		FMK Counterbore					
D mm	Part No.	d ₁	L	L ₁	L ₂	Weldon	No. of inserts/ Size
10,0	FMK-10	4,0	80	23	45,0	12	1x06
11,0	FMK-11	4,0	80	23	45,0	12	1x06
12,0	FMK-12	4,0	80	26	45,0	12	1x06
13,0	FMK-13	5,0	80	26	45,0	12	1x06
14,0	FMK-14	5,0	80	26	45,0	12	1x06
15,0	FMK-15	5,0	80	26	45,0	12	1x06
16,0	FMK-16	5,0	90	31	48,0	16	1x06
17,0	FMK-17	6,0	90	31	48,0	16	1x06
18,0	FMK-18	8,0	90	31	48,0	16	1x06
19,0	FMK-19	8,0	90	31	48,0	16	1x06
20,0	FMK-20	5,0	100	36	50,0	20	1x09
21,0	FMK-21	5,0	100	36	50,0	20	1x09
22,0	FMK-22	6,0	100	36	50,0	20	1x09
23,0	FMK-23	6,0	100	36	50,0	20	1x09
24,0	FMK-24	8,0	120	36	50,0	20	1x09
25,0	FMK-25	8,0	120	43	56,0	20	1x09
26,0	FMK-26	10,0	120	43	56,0	25	1x09
27,0	FMK-27	10,0	120	43	56,0	25	1x09
28,0	FMK-28	12,0	120	43	56,0	25	1x09
29,0	FMK-29	12,0	120	43	56,0	25	1x09
30,0	FMK-30	14,0	120	43	56,0	25	1x09
31,0	FMK-31	14,0	120	43	56,0	25	1x09
32,0	FMK-32	16,0	120	43	56,0	25	1x09
33,0	FMK-33	16,0	120	43	56,0	25	1x09



		FMU Counterbore					
D mm	Part No.	d ₁	L	L ₁	L ₂	Weldon	No. of inserts/ Size
15,0	FMU-15	4,0	100	40	30,0	20	2x06
18,0	FMU-18	6,0	100	40	30,0	20	2x06
20,0	FMU-20	8,0	100	40	30,0	20	2x06
22,0	FMU-22	10,0	100	40	30,0	20	2x06
24,0	FMU-24	6,0	136	68	50,0	25	2x09
26,0	FMU-26	8,0	136	68	50,0	25	2x09
28,0	FMU-28	10,0	136	68	50,0	25	2x09
30,0	FMU-30	12,0	136	66	50,0	32	3x09
33,0	FMU-33	15,0	136	66	50,0	32	3x09
36,0	FMU-36	18,0	136	66	50,0	32	3x09
40,0	FMU-40	16,0	136	66	50,0	32	3x12
43,0	FMU-43	19,0	136	66	50,0	32	3x12
48,0	FMU-48	24,0	146	81	60,0	32	3x12
53,0	FMU-53	29,0	146	81	60,0	32	3x12
57,0	FMU-57	33,0	146	81	60,0	32	3x12



		PK 15°, 30°, 45°, 60°, 75° Chamfer and face milling tool					
D mm	Part No.	d ₁	L	L ₁	L ₂	Weldon	No. of inserts/ Size
19,0	PK15°-19	16,0	90	19	6,0	16	2x06
40,0	PK15°-40	34,0	120	30	11,0	25	2x12
19,0	PK30°-19	13,0	90	19	5,0	16	2x06
40,0	PK30°-40	28,0	120	30	10,0	25	2x12
13,0	PK45°-13	6,0	80	12	4,0	10	1x06
19,0	PK45°-19	11,0	90	19	4,0	16	2x06
26,0	PK45°-26	15,0	100	26	6,0	20	2x09
40,0	PK45°-40	25,0	120	30	8,0	25	2x12
32,0	PK60°-32	17,5	100	26	4,0	20	2x09
32,0	PK75°-32	15,5	100	26	2,0	20	2x09



		FF 2-flute chamfer tool						
D mm	Part No.	d ₁	L	L ₁	L ₂	Weldon	B	No. of inserts/ Size
30,0	FF-30	20,0	120	20	5,0	20	20	2x09
40,0	FF-40	30,0	150	20	5,0	25	25	2x12

FMK
Counterbore "mono" with steel shank and through coolant. DIN1835B. →

FMU
Counterbore "multi" with steel shank and through coolant. DIN1835B. →

PK
Chamfer and face milling tool. ↻↑

FF
2-flute chamfer tool 2x45°. DIN1835B. ↻↑



FM - FMK - FMU - PK ● = Excellent ○ = Good m/min												
Part No.	Working piece				Free cutting steel	Tool steels alloyed	High alloyed steel	Stainless steels	Titanium alloys	High temp resistant steel and alloys	Grey cast iron	Aluminium
	Size	Chip breaker	Grade	Radius	HB 175-225 <800N/mm	HB 200-300 <1000N/mm	HB 200-300 <1000N/mm	HB 175-245 <700N/mm	HB 215-500 <1000N/mm	HB 200-400 <1200N/mm	HB 175-225 <800N/mm	HB <160
	MPHT-N12-D	06	N12	DX6	0,2	● 90-140	● 90-140	● 50-100	● 70-120			
MPHT-N12-P	06	N12	PMK92*	0,2	● 160-300	● 140-220	● 90-150	● 50-180				
MPHT-N13-C	06	N13	CH1	0,2					○ 40-60		● 160-200	● 300-1000
MPHT-N13-K	06	N13	KM22*	0,2					○ 40-70	○ 15-70	● 180-300	● 300-600
MPHT-N14-D	06	N14	DX6	0,2	● 90-140			● 70-120	○ 40-60	○ 15-20		
MPHT-N14-P	06	N14	PMK92*	0,2	● 160-300	● 140-220	● 90-150	● 90-180				
MPHT-N14-P	06	N15	CT50**	0,2	● 250-400	● 200-350	● 180-250	● 150-240		○ 15-70	● 250-400	● 300-1000
MPMT-N12-C	06	N12	CH1	0,4					○ 40-60		● 160-200	● 300-1000
MPMT-N12-D	06	N12	DX6	0,4	● 90-140	● 80-140	● 50-100	● 70-120				
MPMT-N12-P	06	N12	PMK92*	0,4	● 160-300	● 140-220	● 90-150	● 90-180				
MPMT-N12-K	06	N12	KM22*	0,4					○ 40-70	○ 15-70	● 180-300	
MCHT-N12-D	09	N12	DX6	0,4	● 90-140							
MCHT-N12-P	09	N12	PMK92*	0,4	● 160-300	● 140-220	● 90-150	● 90-180				
MCHT-N13-C	09	N13	CH1	0,4					○ 40-60		● 160-300	● 300-1000
MCHT-N13-K	09	N13	KM22*	0,4				● 150-300	○ 40-70	○ 15-70		● 300-600
MCHT-N14-D	09	N14	DX6	0,4	● 90-140	● 90-140	● 50-100	● 70-120				
MCHT-N14-P	09	N14	PMK92*	0,4	● 160-300	● 140-220	● 90-150	● 90-180				
MCHW-N15-C	09	N15	CT50**	0,4	● 250-400	● 200-350	● 180-250	● 150-240			● 250-400	
MCMT-N12-C	09	N12	CH1	0,8					○ 40-70	○ 15-70	● 160-200	● 300-1000
MCMT-N12-P	09	N12	PMK92*	0,8	● 160-300	● 140-220	● 90-150	● 90-180				
MCMT-N12-K	09	N12	KM22*	0,8					○ 40-70	○ 15-70	● 180-300	
MBHT-N12-P	12	N12	PMK92*	0,4	● 160-300	● 140-220	● 90-150	● 90-180		○ 20-60		
MBHT-N13-C	12	N13	CH1	0,4					○ 40-60		● 160-200	● 300-1000
MBHT-N13-K	12	N13	KM22*	0,4				● 150-300	○ 40-70	○ 15-70		● 300-600
MBHT-N14-P	12	N14	PMK92*	0,4	● 160-300	● 140-220	● 90-150	● 90-180				
MBMT-N12-D	12	N12	DX6	0,8	● 90-140	● 90-140	● 50-100	● 70-120				
MBMT-N12-P	12	N12	PMK92*	0,8	● 160-300	● 140-220	● 90-150	● 90-180		○ 20-60		

Chipbreaker for FM-FMK-FMU-PK

N12

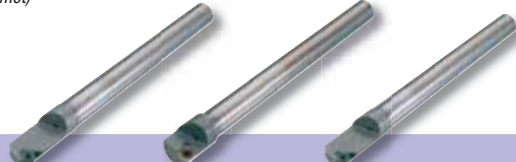
N13

N14

N15

R16

*=(TiAlN), **=(Cermet)



FA - FAH - FAE ● = Excellent ○ = Good m/min												
Part No.	Working piece				Free cutting steel	Tool steels alloyed	High alloyed steel	Stainless steels	Titanium alloys	High temp resistant steel and alloys	Grey cast iron	Aluminium
	Size	Chip breaker	Grade	Radius	HB 175-225 <800N/mm	HB 200-300 <1000N/mm	HB 200-300 <1000N/mm	HB 175-245 <700N/mm	HB 215-500 <1000N/mm	HB 200-400 <1200N/mm	HB 175-225 <800N/mm	HB <160
	MPHT-N12-D	06	N12	DX6	0,2	● 90-140	● 90-140	● 50-100	● 70-120			
MPHT-N12-P	06	N12	PMK92*	0,2	● 160-300	● 140-220	● 90-150	● 50-180				
MPHT-N13-C	06	N13	CH1	0,2					○ 40-60	○ 15-60	● 160-200	● 150-190
MPHT-N13-K	06	N13	KM22*	0,2					○ 40-70	○ 15-70	● 180-300	● 170-270
MPHT-N14-D	06	N14	DX6	0,2	● 100-150	● 80-180	● 50-100	● 70-120				
MPHT-N14-P	06	N14	PMK92*	0,2	● 180-300	● 160-300	● 90-150	● 80-160				
MPHW-N15-C	06	N15	CT50**	0,2	● 250-400	● 250-400	● 180-250		○ 15-70		● 250-400	● 300-1000
MPHX-R16-C	06	R16	CT50**	0,4	● 00-500	● 250-400	● 180-250		○ 15-70		● 250-400	● 300-1000

Chipbreaker for FM-FMK-FMU-PK

N12

N13

N14

N15

R16

*=(TiAlN), **=(Cermet)



FF ● = Excellent ○ = Good m/min												
Part No.	Working piece				Free cutting steel	Tool steels alloyed	High alloyed steel	Stainless steels	Titanium alloys	High temp resistant steel and alloys	Grey cast iron	Aluminium
	Size	Chip breaker	Grade	Radius	HB 175-225 <800N/mm	HB 200-300 <1000N/mm	HB 200-300 <1000N/mm	HB 175-245 <700N/mm	HB 215-500 <1000N/mm	HB 200-400 <1200N/mm	HB 175-225 <800N/mm	HB <160
	SDHT-N17-C	09	N17	CH1								
SDLT-N19-P	09	N19	PMK63***		● 150-250	● 200-250	● 90-180	○ 90-150	● 40-60	○ 15-60	● 160-200	● 300-1000

Chipbreaker for FF

N17

N19

***=(TiN)

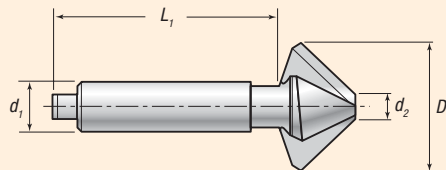
06 = Screw SSK-06 M2,5x4,5 Torx TN-8. 09 = Screw SSK-09 M4x7,5 Torx TN-15. 12 = Screw SSK-12 M4x9,5 Torx TN-15. Screw only FF SSK-08 M3,5x8,5 Torx TN-15.

Countersinks Type 100, with cylindrical shanks



Ø mm	100T				100TT			100TTC			105T
	HSS				HSS TiN			HSS TiCN			HSS Co 5%
	Tol.x9 60°	Tol.x9 80°	Tol.x9 90°	Tol.x9 120°	Tol.x9 60°	Tol.x9 80°	Tol.x9 90°	Tol.x9 60°	Tol.x9 80°	Tol.x9 90°	Tol.x9 90°
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
4,3			100T9-04,3								
5,0			100T9-05,0								
6,0			100T9-06,0								
6,3			100T9-06,3				100TT9-06,0			100TTC9-06,0	105T9-06,0
6,5		100T8-06,5	100T9-06,5				100TT9-06,3			100TTC9-06,3	105T9-06,3
7,0			100T9-07,0								
7,3			100T9-07,3								
8,0	100T6-08,0	100T8-08,0	100T9-08,0				100TT9-08,0			100TTC9-08,0	105T9-08,0
8,3			100T9-08,3				100TT9-08,3			100TTC9-08,3	105T9-08,3
8,6			100T9-08,6								
9,4			100T9-09,4								
10,0	100T6-10,0	100T8-10,0	100T9-10,0	100T12-10,0	100TT6-10,0	100TT8-10,0	100TT9-10,0	100TTC6-10,0	100TTC8-10,0	100TTC9-10,0	105T9-10,0
10,4		100T8-10,4	100T9-10,4				100TT9-10,4			100TTC9-10,4	105T9-10,4
11,5			100T9-11,5								
12,0	100T6-12,0	100T8-12,0	100T9-12,0		100TT6-12,0		100TT9-12,0	100TTC6-12,0		100TTC9-12,0	105T9-12,0
12,4		100T8-12,4	100T9-12,4				100TT9-12,4			100TTC9-12,4	105T9-12,4
13,4			100T9-13,4								
15,0			100T9-15,0				100TT9-15,0			100TTC9-15,0	105T9-15,0
16,0	100T6-16,0	100T8-16,0	100T9-16,0	100T12-16,0	100TT6-16,0		100TT9-16,0	100TTC6-16,0		100TTC9-16,0	
16,4			100T9-16,4								
16,5			100T9-16,5				100TT9-16,5			100TTC9-16,5	105T9-16,5
18,0			100T9-18,0								
19,0			100T9-19,0								
20,0	100T6-20,0	100T8-20,0	100T9-20,0	100T12-20,0	100TT6-20,0	100TT8-20,0	100TT9-20,0	100TTC6-20,0	100TTC8-20,0	100TTC9-20,0	
20,5			100T9-20,5				100TT9-20,5			100TTC9-20,5	105T9-20,5
22,0			100T9-22,0								
23,0			100T9-23,0								
25,0	100T6-25,0	100T8-25,0	100T9-25,0	100T12-25,0	100TT6-25,0	100TT8-25,0	100TT9-25,0	100TTC6-25,0	100TTC8-25,0	100TTC9-25,0	105T9-25,0
26,0			100T9-26,0								
28,0			100T9-28,0								
30,0	100T6-30,0	100T8-30,0	100T9-30,0	100T12-30,0	100TT6-30,0	100TT8-30,0	100TT9-30,0	100TTC6-30,0	100TTC8-30,0	100TTC9-30,0	105T9-30,0
31,0			100T9-31,0								
34,0			100T9-34,0								
35,0			100T9-35,0				100TT9-35,0			100TTC9-35,0	105T9-35,0
37,0			100T9-37,0								
40,0	100T6-40,0	100T8-40,0	100T9-40,0				100TT9-40,0			100TTC9-40,0	105T9-40,0

Dimension table



Type 100 60°, 80°, 90°	D x9	d ₁	d ₂	L ₁
T, TT, TTC	4,3 - 8,3	6,0	1,5	40
TR, TRTC	8,6 - 13,4	6,0	2,0	40
THS	15,0 - 19,0	10,0*	3,0	45
	20,0 - 31,0	10,0*	4,0	45
	34,0 - 40,0	16,0	8,0	50
100TL	12,0 - 13,4	10,0*	2,0	104
	15,0 - 19,0	10,0*	3,0	106
	20,0 - 30,0	10,0*	4,0	106
	12,0 - 15,0	6,0	4,0	40
100TH	16,0 - 30,0	10,0*	4,0	45
	40,0	16,0	8,0	50
100E	8,0 - 20,0	6,0	1,0	30
	25,0 - 30,0	10,0*	2,0	45
100T12 / 105T9	06,0 - 06,3	5,0		
	08,0 - 10,4	6,0		
	12,0 - 12,4	8,0		
	15,0 - 25,0	10,0		
	30,0	12,0		
	35,0 - 40,0	16,0		


* Cylindrical shank with 3 facets.

Countersinks Type 100, with cylindrical shanks




Counterboring / Countersinking

Ø mm	100TR	100TRTC	100TH		100THS	100TL	100E	100TG
	for Stainless steel	for Stainless steel						
	HSS	HSS TiCN	Carbide K10	Carbide K10	Solid Carbide K20	HSS	HSS	HSS
	Tol.x9 90°	Tol.x9 90°	Tol.x9 60°	Tol.x9 90°	Tol.x9 90°	Tol.x9 90°	Tol.x9 90°	Tol.x9 90°
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
8,0	100TR9-08,0	100TRTC9-08,0			100THS9-06,3		100E9-08,0	
8,3	100TR9-08,3	100TRTC9-08,3			100THS9-08,3			
10,0	100TR9-10,0	100TRTC9-10,0					100E9-10,0	
10,4	100TR9-10,4	100TRTC9-10,4			100THS9-10,4			
12,0	100TR9-12,0	100TRTC9-12,0		100TH9-12,0		100TL9-12,0	100E9-12,0	100TG9-12,0
12,4	100TR9-12,4	100TRTC9-12,4			100THS9-12,4			
15,0	100TR9-15,0	100TRTC9-15,0						
16,0	100TR9-16,0	100TRTC9-16,0	100TH6-16,0	100TH9-16,0		100TL9-16,0	100E9-16,0	
16,5	100TR9-16,5	100TRTC9-16,5			100THS9-16,5			
20,0	100TR9-20,0	100TRTC9-20,0	100TH6-20,0	100TH9-20,0		100TL9-20,0	100E9-20,0	100TG9-20,0
20,5	100TR9-20,5	100TRTC9-20,5						
25,0	100TR9-25,0	100TRTC9-25,0	100TH6-25,0	100TH9-25,0		100TL9-25,0	100E9-25,0	
30,0	100TR9-30,0	100TRTC9-30,0	100TH6-30,0	100TH9-30,0		100TL9-30,0	100E9-30,0	100TG9-30,0
35,0	100TR9-35,0	100TRTC9-35,0						
40,0	100TR9-40,0	100TRTC9-40,0		100TH9-40,0				100TG9-40,0



FV 90°, Chamfer and face milling tool

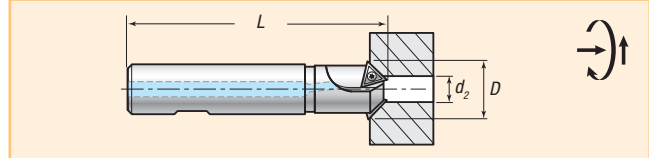
D mm	Part No.	Weldon Shank mm	d _{min} mm	L mm	Chamfers maximum depth mm	No. of inserts
12,0	FV9-12,0	16	6,0	90	5,0	1
12,4	FV9-12,4	16	6,0	90	5,0	1
16,0	FV9-16,0	16	8,0	90	7,5	1
16,5	FV9-16,5	16	8,0	90	7,5	1
20,0	FV9-20,0	20	8,5	100	10,0	2
20,5	FV9-20,5	20	8,5	100	10,0	2
25,0	FV9-25,0	20	13,0	100	12,0	2
30,0	FV9-30,0	20	18,0	100	12,0	2



Inserts for FV

Type of insert	Part No.		Radius mm	
Type of tool D mm	Size of insert	Part No.	Part No.	
FV 12,0 - 16,5	07	TPMT-07T	TPMR-07T	0,4
	07		TPGR-07T	0,4
	07		TPMR-07H	0,4
FV 20,0 - 30,0	10	TPMT-10T	TPMR-10T	0,4
	10		TPGR-10T	0,4
	10		TPMR-10H	0,4


- Carbide quality PK40. All inserts are coated in several layers (TiCN-TiC-TiN).
- The GRANLUND inserts have special chipbreaking angle for optimum chip control.



Cutting data for Chamfering

Material	Speed	Feed	Material	Speed	Feed
Steel <450 N/mm ²	75 - 120 m/min	0,1 - 0,5 mm/rev.	Cast Iron	80 - 110 m/min	0,1-0,5 mm/rev.
Steel <600 N/mm ²	65 - 110 m/min	0,1 - 0,4 mm/rev.	Cast Aluminium	80 - 150 m/min	0,1-1,0 mm/rev.
Steel <1000 N/mm ²	55 - 100 m/min	0,1 - 0,3 mm/rev.			

Cutting data for face milling = 1,5 x Cutting data for Chamfering.



100TSK/100TRSK*		100TB				100TTSK**				
Sets type	Type of Counterbores	Composition: Countersinks type 100 90° HSS - Ø mm								Part No.
100TSK	100T	10,0	16,0	20,0	25,0	30,0				100TSK
100TB**	100T	6,3	8,3	10,4	12,4	16,5	20,5	25,0		100TB
100TRSK*	100TR	10,0	16,0	20,0	25,0	30,0				100TRSK
100TTSK	100TT (TiN)	10,0	16,0	20,0	25,0	30,0				100TTSK

* For stainless. **According to DIN 74, Form B fine.





powered by water



The waterdriven backspotfacer developed by Granlund Tools

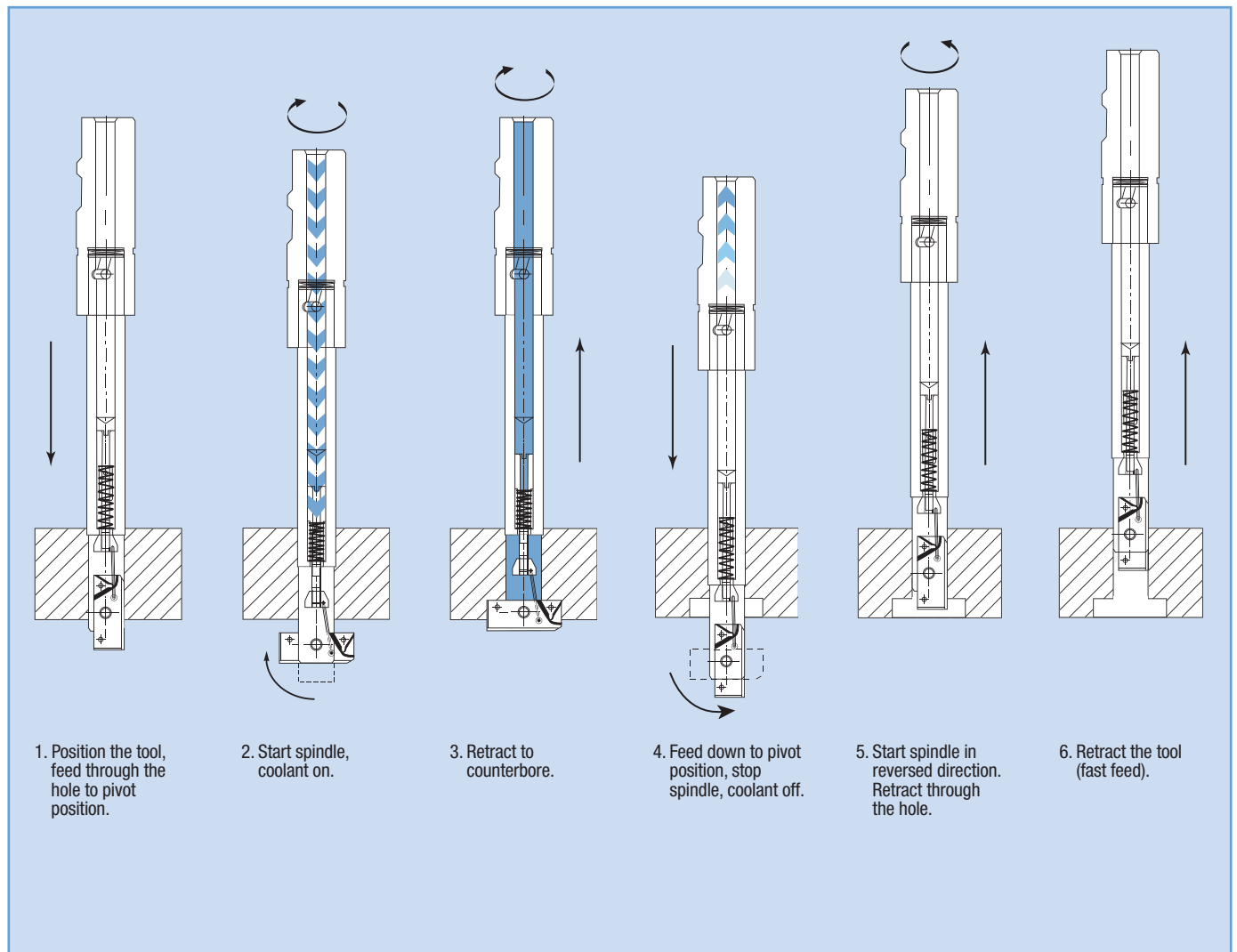
With the Neptune backspotfacer you can produce spotfaces of up to 2 times the diameter of the hole. As a special the tool can be manufactured for an even wider range.

Neptune is powered by coolant through the spindle. It operates using a piston in the shank, which pushes the insert holder out.

The Neptune is a combination tool, where you can strip, and clean the parts, change insert holder for another dimension etc.

The tool is also equipped with an “emergency” function. The shank separates from the holder in case the insert holder doesn’t retract properly. The spindle needs to be reversed during retraction after the spotfacing to ensure that the emergency function operates.

All friction parts are coated with a low friction coating to ensure the function of the tool.



Cutting data for backspotfacer type NE

Workpiece	Speed	Feed
Steel <450 N/mm	50-100 m/min	0,05-0,15 mm/rev.
Steel <600 N/mm	60-110 m/min	0,05-0,15 mm/rev.
Steel <1000 N/mm	50-100 m/min	0,05-0,15 mm/rev.
Cast iron	80-100 m/min	0,10-0,15 mm/rev.
Cast aluminium	80-150 m/min	0,05-0,15 mm/rev.

Operating reversed during retraction

Speed	Feed
400 rpm	500 mm/min

N240 G73 Z600 M5
 N250 G73 X710
 N260 M6
 N270 G57 H901
 N280 G43 Z100. H3 S770
 N290 X0 Y0
 N300 Z50.
 N310 G1 Z-50. F500
 N320 M50
 N330 M3
 N340 G1 Z-33. F200
 N350 G1 Z-27. F77
 N360 G0 Z-50. M9
 N370 G4 P5
 N380 S400 M4
 N390 G1 Z50. F500
 N400 G73 Z600 M5
 N410 M60
 N420 G53
 N430 M30
 *

Application example:

Tool:
NE-17,0/33,0
 Workpiece:
SS 1672 t=33 mm
 Spotface: 3 mm

Sparepart kit

Type	1 set contains:	
NESK-13	2 x Link	1 x Distributor
NESK-15		
NESK-17		
NESK-19		
NESK-21	1 x Spring	1 x Screw
NESK-23		
NESK-25		
NESK-33	2 x Axle	4 x Nut

CAUTION!

Do not operate the tool as single flute. If going into a slope, feed should be reduced to at least 50%.

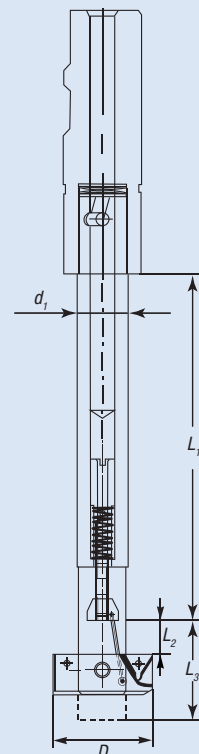


NEPTUNE

Part No.	Inserts	Screws	d_1	D	L_1	L_2	L_3	Shank Weldon
NE-13,0/26,0	TPMT-07T	SSK-20-S	13	26	90	10	26	25
NE-15,0/30,0		SSK-20-S	15	30	90	10	30	25
NE-17,0/26,0		SSK-20	17	26	110	10	26	25
NE-17,0/33,0	TPMT-10T	SSK-22-S	17	33	110	10	33	25
NE-19,0/36,0		SSK-22-S	19	36	110	10	36	25
NE-21,0/33,0		SSK-22	21	33	110	10	33	25
NE-21,0/40,0		SSK-22	21	40	110	10	40	25
NE-23,0/43,0		SSK-22	23	43	110	10	43	32
NE-25,0/40,0		SSK-22	25	40	125	15	40	32
NE-25,0/48,0	TPMT-17T	SSK-40	25	48	125	15	48	32
NE-33,0/61,0		SSK-40	33	61	140	30	61	40

Important!

- Coolant through the spindle or by means of a coolant adapter is required to operate the tool. For reliable operation the pressure should be ≥ 3 bars and the flow ≥ 30 l/min. Before using the tool, make sure that the insert holder pivots freely, lubricate and clean if necessary.

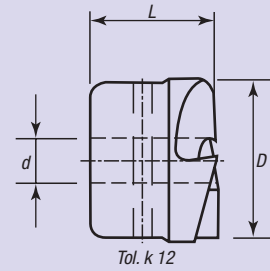




Size d mm			U	UD	UH	UDH
	D mm	L mm	HSS Tol. k12	HSS Tol. p8	Carbide K40 Tol. p8	Carbide K40 Tol. p8
			Part No.	Part No.	Part No.	Part No.
6	12,0	17	U-06/12	UD-06/12	UH-06/12	UDH-06/12
	13,0	17	U-06/13	UD-06/13	UH-06/13	UDH-06/13
	13,5	17	U-06/13,5		UH-06/13,5	
	14,0	17	U-06/14	UD-06/14	UH-06/14	UDH-06/14
	14,5	17	U-06/14,5	UD-06/14,5		UDH-06/14,5
	15,0	17	U-06/15	UD-06/15	UH-06/15	UDH-06/15
	16,0	17	U-06/16	UD-06/16	UH-06/16	UDH-06/16
	17,0	17	U-06/17	UD-06/17	UH-06/17	UDH-06/17
	18,0	17	U-06/18	UD-06/18	UH-06/18	UDH-06/18
	19,0	17	U-06/19		UH-06/19	
	20,0	17	U-06/20	UD-06/20	UH-06/20	UDH-06/20
	22,0	17	U-06/22	UD-06/22	UH-06/22	UDH-06/22
	24,0	17	U-06/24			
	26,0	17	U-06/26			
9	16,0	21	U-09/16		UH-09/16	
	17,0	21	U-09/17		UH-09/17	
	17,5	21		UD-09/17,5		UDH-09/17,5
	18,0	21	U-09/18	UD-09/18	UH-09/18	UDH-09/18
	19,0	21	U-09/19	UD-09/19	UH-09/19	UDH-09/19
	20,0	21	U-09/20	UD-09/20	UH-09/20	UDH-09/20
	21,0	21	U-09/21	UD-09/21	UH-09/21	UDH-09/21
	22,0	21	U-09/22	UD-09/22	UH-09/22	UDH-09/22
	23,0	21	U-09/23	UD-09/23	UH-09/23	UDH-09/23
	24,0	21	U-09/24	UD-09/24	UH-09/24	UDH-09/24
	25,0	21	U-09/25	UD-09/25	UH-09/25	UDH-09/25
	26,0	21	U-09/26	UD-09/26	UH-09/26	UDH-09/26
	28,0	21	U-09/28	UD-09/28	UH-09/28	UDH-09/28
	30,0	21	U-09/30	UD-09/30	UH-09/30	UDH-09/30
32,0	21	U-09/32	UD-09/32	UH-09/32	UDH-09/32	
33,0	21	U-09/33				
34,0	21	U-09/34	UD-09/34	UH-09/34	UDH-09/34	
14	24,0	27	U-14/24	UD-14/24	UH-14/24	UDH-14/24
	25,0	27	U-14/25	UD-14/25		UDH-14/25
	26,0	27	U-14/26	UD-14/26	UH-14/26	UDH-14/26
	27,0	27	U-14/27		UH-14/27	
	28,0	27	U-14/28	UD-14/28	UH-14/28	UDH-14/28
	30,0	27	U-14/30	UD-14/30	UH-14/30	UDH-14/30
	32,0	27	U-14/32	UD-14/32	UH-14/32	UDH-14/32
	33,0	27	U-14/33	UD-14/33	UH-14/33	UDH-14/33
	34,0	27	U-14/34	UD-14/34	UH-14/34	UDH-14/34
	35,0	27	U-14/35	UD-14/35	UH-14/35	UDH-14/35
	36,0	27	U-14/36	UD-14/36	UH-14/36	UDH-14/36
	38,0	27	U-14/38	UD-14/38	UH-14/38	UDH-14/38
	40,0	27	U-14/40	UD-14/40	UH-14/40	UDH-14/40
	41,0	27	U-14/41	UD-14/41	UH-14/41	UDH-14/41
20	32,0	31	U-20/32		UH-20/32	
	32,0	31	U-20/33		UH-20/33	
	34,0	31	U-20/34		UH-20/34	
	35,0	31	U-20/35	UD-20/35	UH-20/35	UDH-20/35
	36,0	31	U-20/36	UD-20/36	UH-20/36	UDH-20/36
	38,0	31	U-20/38	UD-20/38	UH-20/38	UDH-20/38
	40,0	31	U-20/40	UD-20/40	UH-20/40	UDH-20/40
	42,0	31	U-20/42	UD-20/42	UH-20/42	UDH-20/42
	43,0	31	U-20/43			
	44,0	31	U-20/44	UD-20/44		UDH-20/44
	45,0	31	U-20/45	UD-20/45	UH-20/45	UDH-20/45
	46,0	31	U-20/46	UD-20/46	UH-20/46	UDH-20/46
	48,0	31	U-20/48	UD-20/48	UH-20/48	UDH-20/48
	50,0	31	U-20/50	UD-20/50	UH-20/50	UDH-20/50
52,0	31	U-20/52	UD-20/52	UH-20/52	UDH-20/52	
55,0	31	U-20/55	UD-20/55	UH-20/55	UDH-20/55	
57,0	31	U-20/57	UD-20/57	UH-20/57	UDH-20/57	
30	60,0	38	U-30/60	UD-30/60	UH-30/60	UDH-30/60
	62,0	38	U-30/62	UD-30/62	UH-30/62	UDH-30/62
	64,0	38	U-30/64	UD-30/64		UDH-30/64
	65,0	38	U-30/65	UD-30/65	UH-30/65	UDH-30/65
	68,0	38	U-30/68	UD-30/68	UH-30/68	UDH-30/68
	70,0	38	U-30/70	UD-30/70	UH-30/70	UDH-30/70
	71,0	38	U-30/71			
	72,0	38	U-30/72	UD-30/72	UH-30/72	UDH-30/72
	75,0	38	U-30/75	UD-30/75	UH-30/75	UDH-30/75
	76,0	38		UD-30/76	UH-30/76	UDH-30/76
	80,0	38	U-30/80	UD-30/80	UH-30/80	UDH-30/80
	82,0	38	U-30/82			
	83,0	38	U-30/83			

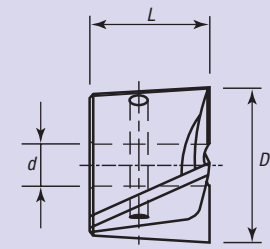
Larger and intermediate sizes available on request.

Type U, UD, UH and UDH



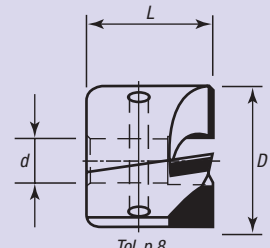
Tol. k 12

Type U



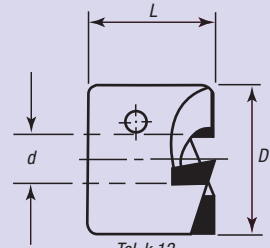
Tol. p 8

Type UD



Tol. p 8

Type UDH



Tol. k 12

Type UH

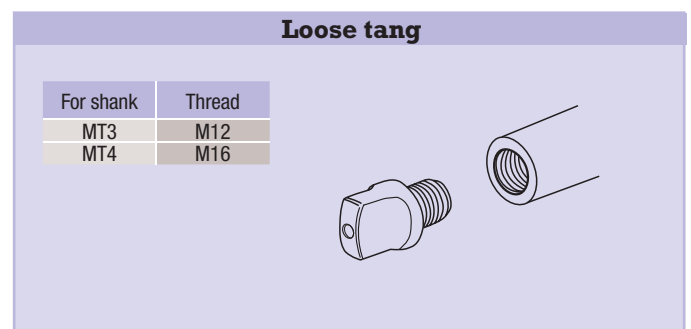
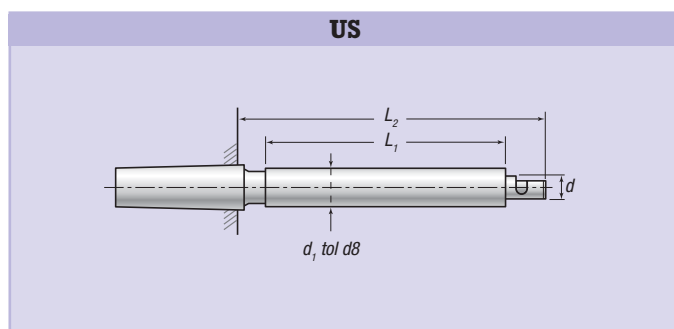
Backspotfacing system



US MT					
Size d mm	d ₁ mm	L ₁ mm	L ₂ mm	Shank	Type US
	Part No.				
6	6,0*	55	92	MT1	US-06/06,0-MK1
	6,5*	55	92	MT1	US-06/06,5-MK1
	7,0*	55	92	MT1	US-06/07,0-MK1
	7,5	55	92	MT1	US-06/07,5-MK1
	8,0	55	92	MT1	US-06/08,0-MK1
	8,5	55	92	MT1	US-06/08,5-MK1
	9,0	55	92	MT1	US-06/09,0-MK1
	9,5	55	92	MT1	US-06/09,5-MK1
9	10,0	55	92	MT1	US-06/10,0-MK1
	9,0*	75	116	MT2	US-09/09,0-MK2
	9,5*	75	116	MT2	US-09/09,5-MK2
	10,0*	75	116	MT2	US-09/10,0-MK2
	10,5	75	116	MT2	US-09/10,5-MK2
	11,0	75	116	MT2	US-09/11,0-MK2
	11,5	75	116	MT2	US-09/11,5-MK2
	12,0	75	116	MT2	US-09/12,0-MK2
	12,5	75	116	MT2	US-09/12,5-MK2
	13,0	75	116	MT2	US-09/13,0-MK2
	13,5	75	116	MT2	US-09/13,5-MK2
	14,0	75	116	MT2	US-09/14,0-MK2
	14,5	75	116	MT2	US-09/14,5-MK2
	15,0	75	116	MT2	US-09/15,0-MK2
14	14,0*	90	143	MT3	US-14/14,0-MK3
	14,5*	90	143	MT3	US-14/14,5-MK3
	15,0*	90	143	MT3	US-14/15,0-MK3
	16,0	90	143	MT3	US-14/16,0-MK3
	17,0	90	143	MT3	US-14/17,0-MK3
	18,0	90	143	MT3	US-14/18,0-MK3
	19,0	90	143	MT3	US-14/19,0-MK3
	20,0	90	143	MT3	US-14/20,0-MK3
	21,0	90	143	MT3	US-14/21,0-MK3
	22,0	90	143	MT3	US-14/22,0-MK3
20	20,0*	90	147	MT3	US-20/20,0-MK3
	21,0*	90	147	MT3	US-20/21,0-MK3
	22,0	90	147	MT3	US-20/22,0-MK3
	23,0	90	147	MT3	US-20/23,0-MK3
	24,0	90	147	MT3	US-20/24,0-MK3
	25,0	110	169	MT4	US-20/25,0-MK4
	26,0	110	169	MT4	US-20/26,0-MK4
	27,0	110	169	MT4	US-20/27,0-MK4
	28,0	110	169	MT4	US-20/28,0-MK4
	30,0	110	169	MT4	US-20/30,0-MK4
30	32,0	110	169	MT4	US-20/32,0-MK4
	30,0*	130	205	MT4	US-30/30,0-MK4
	32,0	130	205	MT4	US-30/32,0-MK4
	33,0	130	205	MT4	US-30/33,0-MK4
	34,0	130	205	MT4	US-30/34,0-MK4
	35,0	130	205	MT4	US-30/35,0-MK4
	36,0	130	205	MT4	US-30/36,0-MK4
	38,0	130	205	MT4	US-30/38,0-MK4
	39,0	130	205	MT4	US-30/39,0-MK4
	40,0	130	205	MT4	US-30/40,0-MK4
43,0	130	205	MT4	US-30/42,0-MK4	
45,0	130	205	MT4	US-30/45,0-MK4	

US Weldon						
Size d mm	d ₁ mm	L ₁ mm	L ₂ mm	Shank	Type US	
	Part No.					
6	6,0*	55	99	Weldon 12	US-06/06,0-W12	
	6,5*	55	99	Weldon 12	US-06/06,5-W12	
	7,0*	55	99	Weldon 12	US-06/07,0-W12	
	8,0	55	99	Weldon 12	US-06/08,0-W12	
	8,5	55	99	Weldon 12	US-06/08,5-W12	
	9,0	55	99	Weldon 12	US-06/09,0-W12	
	9,5	55	99	Weldon 12	US-06/09,5-W12	
	10,0	55	99	Weldon 12	US-06/10,0-W12	
	9	9,0*	75	128	Weldon 16	US-09/09,0-W16
		9,5*	75	128	Weldon 16	US-09/09,5-W16
10,0*		75	128	Weldon 16	US-09/10,0-W16	
10,5		75	128	Weldon 16	US-09/10,5-W16	
11,0		75	128	Weldon 16	US-09/11,0-W16	
11,5		75	128	Weldon 16	US-09/11,5-W16	
12,0		75	128	Weldon 16	US-09/12,0-W16	
12,5		75	128	Weldon 16	US-09/12,5-W16	
13,0		75	128	Weldon 16	US-09/13,0-W16	
14,0		75	128	Weldon 16	US-09/14,0-W16	
14	15,0	75	128	Weldon 16	US-09/15,0-W16	
	14,0*	90	143	Weldon 20	US-14/14,0-W20	
	14,5*	90	143	Weldon 20	US-14/14,5-W20	
	15,0*	90	143	Weldon 20	US-14/15,0-W20	
	16,0	90	143	Weldon 20	US-14/16,0-W20	
	17,0	90	143	Weldon 20	US-14/17,0-W20	
	18,0	90	143	Weldon 20	US-14/18,0-W20	
	19,0	90	143	Weldon 20	US-14/19,0-W20	
	20,0	90	143	Weldon 20	US-14/20,0-W20	
	21,0	90	143	Weldon 20	US-14/21,0-W20	
20	22,0	90	143	Weldon 20	US-14/22,0-W20	
	20,0*	90	147	Weldon 20	US-20/20,0-W20	
	21,0*	90	147	Weldon 20	US-20/21,0-W20	
	22,0	90	147	Weldon 20	US-20/22,0-W20	
	23,0	90	147	Weldon 20	US-20/23,0-W20	
	24,0	90	147	Weldon 20	US-20/24,0-W20	
	25,0	110	169	Weldon 20	US-20/25,0-W20	
	26,0	110	169	Weldon 20	US-20/26,0-W20	
	27,0	110	169	Weldon 20	US-20/27,0-W20	
	28,0	110	169	Weldon 20	US-20/28,0-W20	
30	30,0	110	169	Weldon 20	US-20/30,0-W20	
	32,0	110	169	Weldon 20	US-20/32,0-W20	
	30,0*	130	205	Weldon 25	US-30/30,0-W25	
	32,0	130	205	Weldon 25	US-30/32,0-W25	
	33,0	130	205	Weldon 25	US-30/33,0-W25	
	34,0	130	205	Weldon 25	US-30/34,0-W25	
	35,0	130	205	Weldon 25	US-30/35,0-W25	
	36,0	130	205	Weldon 25	US-30/36,0-W25	
	38,0	130	205	Weldon 25	US-30/38,0-W25	
	39,0	130	205	Weldon 25	US-30/39,0-W25	
40,0	130	205	Weldon 25	US-30/40,0-W25		
42,0	130	205	Weldon 25	US-30/42,0-W25		
45,0	130	205	Weldon 25	US-30/45,0-W25		

* Not to be used combined with carbide cutters.



Backspotfacing

Backspotfacing/chamfering tools



BV Backspotfacer						
Shank Weldon						
D mm	d _{min} mm	Part No.	Shank Weldon	L ₁ mm	L ₂ mm	E* mm
18,0	10,5	BV-18,0/10,5	16	35	13	4,10
20,0	13,0	BV-20,0/13,0	16	40	13	3,85
24,0	15,0	BV-24,0/15,0	20	50	13	4,65
26,0	17,0	BV-26,0/17,0	20	50	13	4,85
30,0	19,0	BV-30,0/19,0	25	60	16	5,65
33,0	21,0	BV-33,0/21,0	25	70	16	6,40
36,0	23,0	BV-36,0/23,0	25	70	16	6,65
40,0	25,0	BV-40,0/25,0	25	80	16	7,90
48,0	31,0	BV-48,0/31,0	32	90	16	8,90

* = Position place.



BFV 90° Backspotfacer						
Shank Weldon						
D mm	d _{min} mm	Part No.	Shank Weldon	L ₁ mm	L ₂ mm	E* mm
15,0	10,0	BFV-15,0/10,0	16	35	13	2,70
20,0	14,0	BFV-20,0/14,0	16	40	13	3,20
23,0	17,0	BFV-23,0/17,0	20	50	13	3,20
27,0	21,0	BFV-27,0/21,0	25	70	13	3,20
31,0	24,0	BFV-31,0/24,0	25	80	13	3,70

* = Position place.

Special dimension available on request.



DFV 90° Front/Backspotfacer						
Shank Weldon						
D mm	d _{min} mm	Part No.	Shank Weldon	L ₁ mm	L ₂ mm	E* mm
15,0	10,0	DFV-15,0/10,0	16	35	13	2,70
20,0	14,0	DFV-20,0/14,0	16	40	13	3,20
23,0	17,0	DFV-23,0/17,0	25	50	13	3,20
27,0	21,0	DFV-27,0/21,0	32	70	13	3,20
31,0	24,0	DFV-31,0/24,0	32	80	13	3,70

* = Position place.

Insert for BV, BFV, DFV and FV

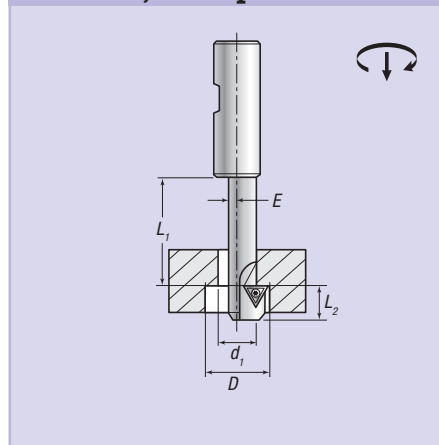
Type of insert				
Type of tools D mm	Size of insert	Part No.	Part No.	Radius mm
BV 18,0 - 27,0	07	TPMT-07T	TPMR-07T	0,4
DFV 15,0 - 31,0	07		TPGR-07T	0,4
BFV 15,0 - 31,0	07		TPMR-07H	0,4
BV >27,0 - 48,0	10	TPMT-10T	TPMR-10T	0,4
	10		TPGR-10T	0,4
	10		TPMR-10H	0,4

- Carbide quality PK40. All inserts are coated in several layers (TiCN-TiC-TiN).
- The GRANLUND inserts have special chipbreaking angel for optimum chip control.

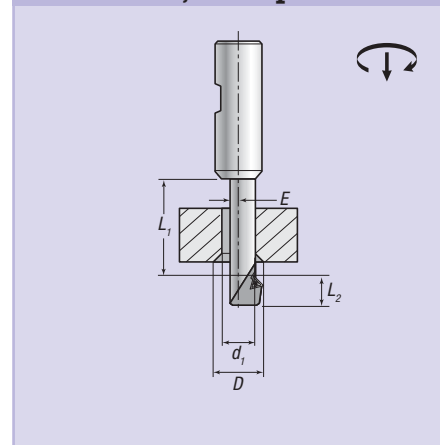
Cutting data for type BV, BFV and DFV

Material	Speed	Feed	Material	Speed	Feed
Steel <450 N/mm ²	80 -120 m/min	0,05 - 0,15 mm/rev.	Cast Iron	80 - 110 m/min	0,05 - 0,15 mm/rev.
Steel <600 N/mm ²	60 -110 m/min	0,05 - 0,15 mm/rev.	Cast Aluminium	80 - 150 m/min	0,05 - 0,15 mm/rev.
Steel <1000 N/mm ²	50 -100 m/min	0,05 - 0,15 mm/rev.			

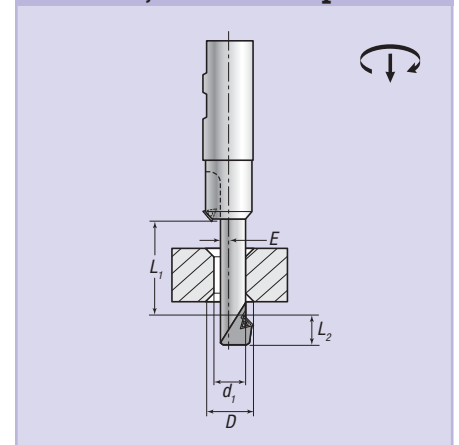
BV, Backspotfacer



BFV 90°, Backspotfacer



DFV 90°, Front/Backspotfacer



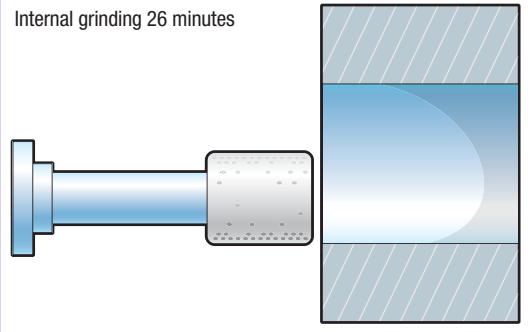


Hard Part Reaming

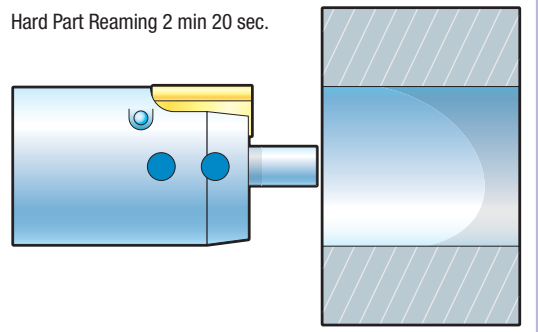
- Reaming in hardened Steel and HSS up to 68 HRC.
- Replaces internal grinding with improved geometry and surface finish.
- Time savings of up to 90%.
- Straightens holes after hardening.

D mm	Type RE				
	Ød Tol. h6 mm	L ₁ mm	L ₂ mm	Insert	Part No.
12	16	60	48	EC-05	RE-12,0
13	16	60	48	EC-05	RE-13,0
14	16	60	48	EC-05	RE-14,0
15	20	60	50	EC-05	RE-15,0
16	20	60	50	EC-05	RE-16,0
17	20	60	50	EC-05	RE-17,0
18	20	60	50	EC-05	RE-18,0
19	20	60	50	EC-05	RE-19,0
20	20	60	50	EC-05	RE-20,0
21	20	60	50	EC-05	RE-21,0
22	20	60	50	EC-05	RE-22,0
23	20	60	50	EC-05	RE-23,0
24	20	60	50	EC-05	RE-24,0
25	20	60	50	EC-05	RE-25,0
26	20	60	50	EC-05	RE-26,0
27	20	60	50	EC-05	RE-27,0
28	20	60	50	EC-05	RE-28,0
29	20	60	50	EC-05	RE-29,0
30	20	60	50	EC-05	RE-30,0
32	20	60	50	EC-05	RE-32,0
34	20	60	50	EC-05	RE-34,0
35	20	60	50	EC-05	RE-35,0
36	20	60	50	EC-05	RE-36,0
38	25	60	56	EC-05	RE-38,0
40	25	60	56	EC-05	RE-40,0
42	25	60	56	EC-05	RE-42,0
44	25	60	56	EC-05	RE-44,0
45	25	60	56	EC-05	RE-45,0
46	25	60	56	EC-05	RE-46,0
48	25	60	56	EC-05	RE-48,0
50	25	60	56	EC-05	RE-50,0

Internal grinding 26 minutes



Hard Part Reaming 2 min 20 sec.

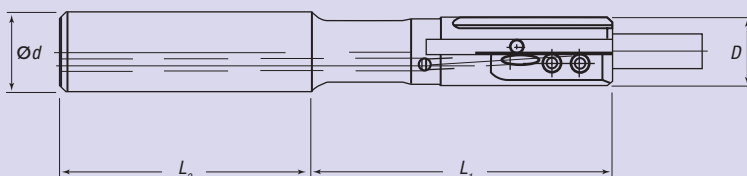


Case study: By altering the method from internal grinding to Hard Part Reaming, in a complex workpiece with hardness 58-62 HRC, a customer reduced his machining time from 26 minutes to 2 minutes and 20 seconds. The surface finish improved from 0,6 to 0,2 Ra. Roundness was 4µ.

All Hard Part Reamers have internal coolant as standard.

Standard sizes are delivered preset to +0,008 mm from min. diameter tolerance H7.

The standard sizes will produce holes according to the nominal diameter of the reamer and with H7 tolerance. The adjustability of the reamer can be used to increase the tolerance band or for fine-adjustment within a certain tolerance. Intermediate diameters are manufactured and preset to your requirements.



Cutting data

Workpiece	Steel and HSS
Hardness	55-68 HRC
Speed	18-120 m/min
Feed	0,10 mm/rev.
Working allowance	0,20-0,40 mm
Coolant pressure	≥ 3 bar



Ø D mm					RD For through and blind holes	RA For through holes	RB For blind holes
	Tol. h6 d mm	L ₁ mm	L ₂ mm	Insert size	Part No.	Part No.	Part No.
10	16	85	48	04	RD-10,0*		
11	16	85	48	04	RD-11,0*		
12	16	120	48	04	RD-12,0		
13	16	120	48	04	RD-13,0		
14	16	120	48	04	RD-14,0		
15	20	120	50	04	RD-15,0		
16	20	120	50	08		RA-16,0	RB-16,0
17	20	120	50	08		RA-17,0	RB-17,0
18	20	120	50	08		RA-18,0	RB-18,0
19	20	120	50	08		RA-19,0	RB-19,0
20	20	120	50	08		RA-20,0	RB-20,0
21	20	120	50	11		RA-21,0	RB-21,0
22	20	120	50	11		RA-22,0	RB-22,0
23	20	120	50	11		RA-23,0	RB-23,0
24	20	120	50	11		RA-24,0	RB-24,0
25	20	120	50	11		RA-25,0	RB-25,0
26	20	120	50	11		RA-26,0	RB-26,0
27	20	120	50	11		RA-27,0	RB-27,0
28	20	120	50	11		RA-28,0	RB-28,0
29	20	120	50	11		RA-29,0	RB-29,0
30	20	120	50	11		RA-30,0	RB-30,0
31	20	120	50	11		RA-31,0	RB-31,0
32	20	120	50	11		RA-32,0	RB-32,0
33	20	120	50	11		RA-33,0	RB-33,0
34	20	120	50	11		RA-34,0	RB-34,0
35	20	120	50	11		RA-35,0	RB-35,0
36	20	120	50	11		RA-36,0	RB-36,0
37	20	120	50	11		RA-37,0	RB-37,0
38	20	120	50	11		RA-38,0	RB-38,0
39	20	120	50	11		RA-39,0	RB-39,0
40	20	120	50	11		RA-40,0	RB-40,0
41	20	120	50	11		RA-41,0	RB-41,0
42	20	120	50	11		RA-42,0	RB-42,0
43	20	120	50	11		RA-43,0	RB-43,0
44	20	120	50	11		RA-44,0	RB-44,0
45	20	120	50	11		RA-45,0	RB-45,0
46	20	120	50	11		RA-46,0	RB-46,0
47	20	120	50	11		RA-47,0	RB-47,0
48	20	120	50	11		RA-48,0	RB-48,0
49	20	120	50	11		RA-49,0	RB-49,0
50	20	120	50	11		RA-50,0	RB-50,0

RD adjustment range -0 +0,03. RA, RB adjustment range -0 +0,05. * = Internal coolant standard except for RD Ø 10, 11.

Guide to quick reamer selection

Select diameter and tolerance

Standard sizes are delivered preset to +0,008 mm from min. diameter of tolerance H7 with an uncoated insert.
The standard sizes will produce holes according to the nominal diameter of the reamer and with H7 tolerance.
The adjustability of the reamer can be used to increase the tolerance band or for fine-adjustment within a certain tolerance.
Intermediate diameters are manufactured and preset to your requirements.

Guide to quick insert selection

Uncoated DC, BC, AC Non ferrous alloys. Where a sharp cutting edge is required.



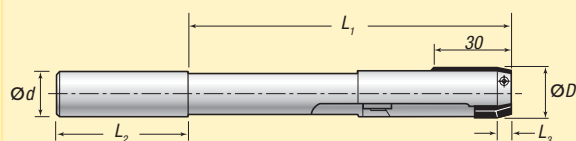
TiN coated DCT, BCT, ACT High cutting data. Long tool-life. Not suitable for aluminium.



Cermet DCC, BCC, ACC For steel and grey cast iron. High cutting speed. Durable. Wear resistant. Other coatings can be offered on request.






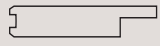

RD, RA and RB



Insert	For type	ØD range	Diagram
DC-04 DCT-04 DCC-04	RD	09,90 - 15,90	
BC-08 BCT-08 BCC-08	RB	15,91 - 21,60	
BC-11 BCT-11 BCC-11	RB	21,61 - 120,0	
AC-08 ACT-08 ACC-08	RA	15,91 - 21,60	
AC-11 ACT-11 ACC-11	RA	21,61 - 120,0	

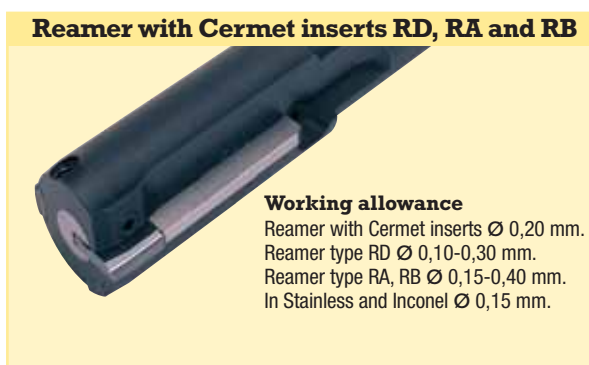
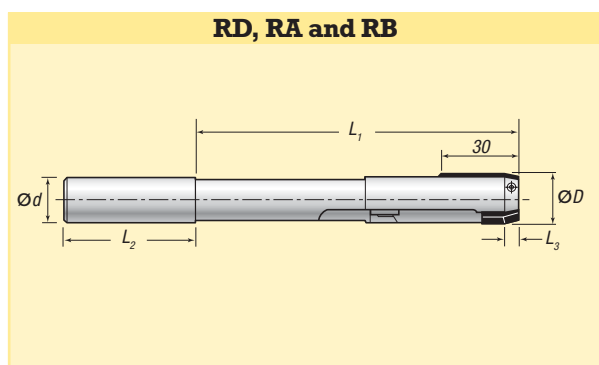
Cutting data indexable insert reamer							
Material		Feed	Uncoated Coolant supply		TiN coated Coolant supply		Cermet Coolant
			Internal	External	Internal	External	Internal
1. Steel	<700N/mm ²	0,1 - 0,4	20 - 60	12 - 25	25 - 70	15 - 30	100 - 300
1. Steel	<1000 N/mm ²	0,1 - 0,4	15 - 40	10 - 18	25 - 45	15 - 25	100 - 200
1. Steel	>1000 N/mm ²	0,1 - 0,4	20 - 40	8 - 15	25 - 45	10 - 20	100 - 130
2. Cast steel	>800 N/mm ²	0,1 - 0,4	20 - 50	10 - 20	25 - 60	10 - 25	-
3. Stainless		0,1 - 0,3	15 - 30	7 - 15	10 - 30	7 - 15	-
4. Inconel		0,1 - 0,3	10 - 20	5 - 15	10 - 20	5 - 15	-
5. Cast Iron	<210 HB	0,15 - 0,4	30 - 70	15 - 35	20 - 70	15 - 35	100 - 300
5. Cast Iron	>210 HB	0,15 - 0,4	30 - 50	15 - 35	20 - 50	15 - 35	100 - 250
6. Malleable iron		0,1 - 0,3	30 - 50	12 - 25	15 - 50	12 - 25	-
7. Aluminium	Short chip	0,1 - 0,3	30 - 70	12 - 30	-	-	-
7. Aluminium	Long chip	0,1 - 0,3	20 - 70	12 - 30	-	-	-
8. Bronze	Hard	0,1 - 0,3	15 - 50	6 - 20	15 - 50	6 - 20	-
8. Bronze	Soft	0,1 - 0,3	15 - 50	10 - 20	15 - 50	10 - 20	-
9. Brass	Short chip	0,1 - 0,4	25 - 70	10 - 50	25 - 70	10 - 50	-
9. Brass	Long chip	0,1 - 0,3	20 - 45	8 - 25	20 - 45	10 - 25	-
10. Copper	Hard	0,1 - 0,4	20 - 60	10 - 30	20 - 60	10 - 30	-
10. Copper	Soft	0,1 - 0,3	20 - 50	10 - 20	20 - 60	10 - 20	-
11. Plastic		0,1 - 0,4	30 - 70	10 - 30	30 - 70	10 - 30	-

Emulsion with minimum 6% concentration recommended.

Spare parts for reamers type RA, RB, RD						
	Eccentric screw	Adjusting screw	Wedge	Pivot	Hexagon key	Spare set
Diameter part range mm						2 pcs ecc screws 2 pcs adj screws 2 pcs wedges
9,90-12,90	ES-3	AS-3	W-1	F-04	SN-1,5 SN-2,0	RSB-01
12,91-15,90	ES-3	AS-3	W-2	F-04	SN-1,5 SN-2,0	RSB-02
15,91-17,90	ES-3	AS-3	W-2	F-08	SN-1,5 SN-2,5	RSB-02
17,91-21,60	ES-4	AS-5	W-3	F-08	SN-2,5	RSB-04
21,61-23,60	ES-4	AS-5	W-3	F-11	SN-2,5	RSB-05
23,61-30,60	ES-4	AS-5	W-4	F-11	SN-2,5	RSB-06
30,61-34,60	ES-4	AS-5	W-5	F-11	SN-2,5	RSB-07
34,61-50,00	ES-4	AS-5	W-6	F-11	SN-2,5	RSB-08

Special					
		No internal coolant		With internal coolant	
		MIN. mm	MAX. mm	MIN. mm	MAX. mm
Ls = Length of guide pad	Ls	30,0	120	30	120
L ₁ = Reamer working length	L ₁	60,0	1000	60	1000
D = Reamer diameter	D*	9,9	120	12	120
d = Shank diameter	d	10,0	50	16	50

*Cylindrical Shank is standard, can also be manufactured with Weldon Shank.



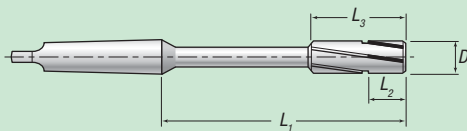
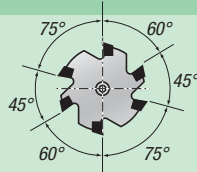
Carbide reamers, re-sizeable and fixed



H7 D mm	507					507C					509				509C				509CC							
	Carbide K10					Carbide K10					Carbide K10				Carbide K10				Cermet							
	L ₁	L ₂	L ₃	Shank MT	Part No.	L	L ₁	L ₂	L ₃	Shank cyl. d	Part No.	L ₁	L ₂	Shank MT	Part No.	L	L ₁	L ₂	Shank cyl. d	Part No.	L	L ₁	L ₂	Shank cyl. d	Part No.	
6,0	73	32		1	507-06	102	57	32		10	507C-06															
7,0	85	32		1	507-07	114	69	32		10	507C-07															
8,0	91	32		1	507-08	122	75	32		10	507C-08	91	16	1	509-08	122	75	16	10	509C-08						
9,0	97	36		1	507-09	130	81	36		10	507C-09	97	20	1	509-09	130	81	20	10	509C-09						
10,0	103	40		1	507-10	140	87	40		10	507C-10	103	20	1	509-10	140	87	20	10	509C-10						
11,0	110	40		1	507-11	149	96	40		10	507C-11	110	20	1	509-11	149	96	20	10	509C-11						
12,0	117	20	45	1	507-12	158	105	20	45	10	507C-12	117	20	1	509-12	158	105	20	10	509C-12	158	105	20	10	509CC-12	
13,0	117	20	45	1	507-13	158	105	20	45	10	507C-13	117	20	1	509-13	158	105	20	10	509C-13	158	105	20	10	509CC-13	
14,0	124	20	45	1	507-14	166	110	20	45	16	507C-14	124	20	2	509-14	166	110	20	16	509C-14	166	110	20	16	509CC-14	
15,0	124	20	50	2	507-15	182	112	20	50	20	507C-15	124	30	2	509-15	182	112	30	20	509C-15	182	112	30	20	509CC-15	
16,0	130	20	50	2	507-16	190	120	20	50	20	507C-16	130	30	2	509-16	190	120	30	20	509C-16	190	120	30	20	509CC-16	
17,0	134	20	50	2	507-17	193	123	20	50	20	507C-17	134	30	2	509-17	193	123	30	20	509C-17	193	123	30	20	509CC-17	
18,0	139	20	56	2	507-18	200	130	20	56	20	507C-18	139	30	2	509-18	200	130	30	20	509C-18	200	130	30	20	509CC-18	
19,0	143	20	56	2	507-19	201	131	20	56	20	507C-19	143	30	2	509-19	201	131	30	20	509C-19	201	131	30	20	509CC-19	
20,0	148	20	60	2	507-20	207	137	20	60	20	507C-20	148	30	2	509-20	207	137	30	20	509C-20	207	137	30	20	509CC-20	
22,0	157	20	64	2	507-22	227	157	20	64	20	507C-22	157	30	2	509-22	227	157	30	20	509C-22						
23,0	161	20	64	2	507-23	231	161	20	64	20	507C-23	161	30	2	509-23	231	161	30	20	509C-23						
24,0	169	20	70	3	507-24	239	169	20	70	20	507C-24	169	30	3	509-24	239	169	30	20	509C-24						
25,0	169	20	70	3	507-25	239	169	20	70	20	507C-25	169	30	3	509-25	239	169	30	20	509C-25						
26,0	174	20	70	3	507-26	244	174	20	70	20	507C-26	174	30	3	509-26	244	174	30	20	509C-26						
28,0	178	30	70	3	507-28	248	178	30	70	25	507C-28	178	30	3	509-28	248	178	30	25	509C-26						
30,0	182	30	70	3	507-30	252	182	30	70	25	507C-30	182	30	3	509-30	252	182	30	25	509C-30						
35,0	197	30	78	4	507-35	267	197	30	78	25	507C-35															
40,0	205	30	78	4	507-40	275	205	30	78	25	507C-40															

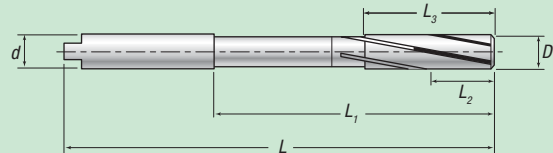
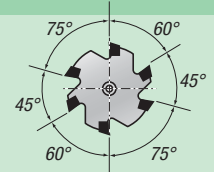
Typ 507 Reamer

Solid reamer, left hand spiral 8-10°, extreme differential pitch. Solid carbide tip 6-11 mm, brazed flutes Ø 12-40 mm. Grade ISO K10. DIN8094 Form B.



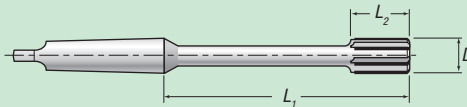
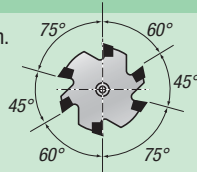
Type 507C Reamer

Solid reamer, left hand spiral 8-10°, extreme differential pitch. Solid carbide tip 6-11 mm, brazed flutes Ø 12-40 mm. Grade ISO K10.



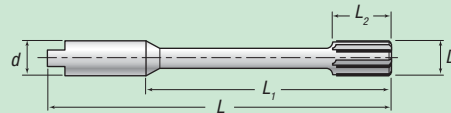
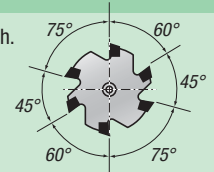
Type 509 Reamer

Solid reamer, straight flutes, extreme differential pitch. Grade ISO K10. DIN 8051 Form A.



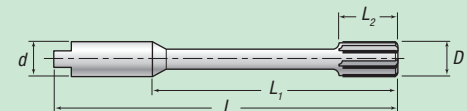
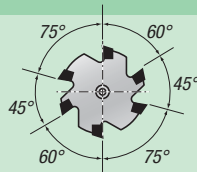
Type 509C Reamer

Solid reamer, straight flutes, extreme differential pitch. Grade ISO K10.



Type 509CC Reamer

Solid reamer, straight flutes, extreme differential. Cermet: high cutting speed and wear resistance in steel and cast iron applications. The optimum solution when the cutting conditions are stable.




Common features:


- Reamers are stocked in tolerance H7 and also semi-finished for quick conversion to customers' requirements.
- Differential pitched flutes, for round holes and elimination of vibration.
- Lapped flutes for a better surface finish.

Fully floating toolholders for reamers

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Tools

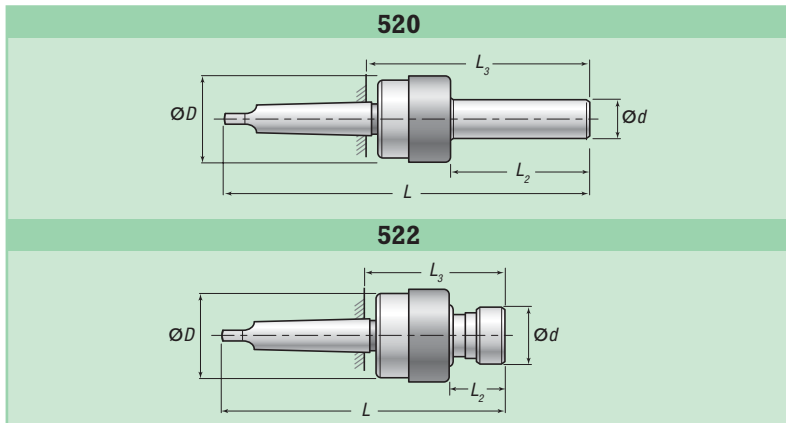


H7 D mm	510C				511 (Re-sizeable)				
	Carbide K10				Carbide K10				
	L ₁	L ₂	Shank cyl. d	Part No.	L ₁	L ₂	No. of Shank flute	MT	Part No.
4,0	90	16	4,0	510C-04					
5,0	90	16	5,0	510C-05					
6,0	110	16	5,0	510C-06					
7,0	120	16	6,0	510C-07					
8,0	120	16	7,0	510C-08	100	20	4	1	511-08
9,0	120	20	8,0	510C-09	100	20	4	1	511-09
10,0	130	20	9,0	510C-10	100	20	4	1	511-10
11,0	130	20	10,0	510C-11	100	20	4	1	511-11
12,0	130	20	11,0	510C-12	100	20	4	1	511-12
13,0	140	30	12,0	510C-13	115	20	6	1	511-13
14,0	140	30	12,0	510C-14	115	20	6	1	511-14
15,0					116	20	6	2	511-15
16,0					116	30	6	2	511-16
17,0					116	30	6	2	511-17
18,0					116	30	6	2	511-18
19,0					136	30	6	2	511-19
20,0					136	30	6	2	511-20
22,0					156	30	6	2	511-22
24,0					162	30	6	3	511-24
25,0					162	30	6	3	511-25
26,0					162	30	8	3	511-26
28,0					162	30	8	3	511-28
30,0					182	30	8	3	511-30



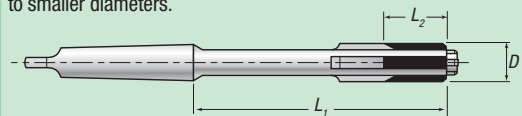
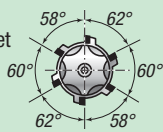
Type	Shank	Internal fitting	d	D	L	L ₂	L ₃	S	α°	Part No.
520	MT2	MT1	18	51	200	74	123	3,0	1,5	520-MK2/1
	MT2	MT2	23	51	210	87	136	3,0	1,5	520-MK2/2
	MT3	MT2	23	51	232	87	137	3,0	1,5	520-MK3/2
	MT3	MT3	33	57	258	107	162	2,0	1,0	520-MK3/3
	MT4	MT3	33	57	280	107	164	2,0	1,0	520-MK4/3
522*	MT4	MT4	41	75	321	132	202	2,4	1,0	520-MK4/4
	MT2	∅ 2,8-13 mm	37	57	166	36	92	2,0	1,0	522-MK2/13

* The holder is delivered with collet 440.



Type 511 Reamer

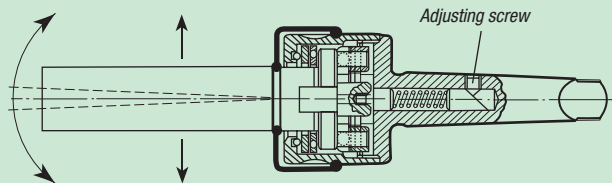
Re-sizeable reamer, straight flutes, differential pitch, for through holes. Grade ISO K10. The expanding reamer can be resized to offset wear by driving the expansion plug further into the reamer. Resizing can normally be done 2-3 times with regrinding. Driving the plug 1 mm further into the reamer will increase the diameter by 0,033 mm. Note: Type 511 reamer cannot be resized to smaller diameters.



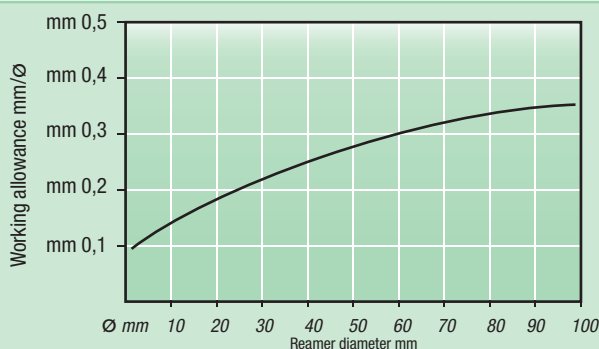
Floating holders for reamers

These have been designed to compensate parallel and angular mis-alignment of the reamer and the workpiece. Using a floating holder for reaming will improve surface finish and the life expectancy of the reamer.

The stiffness can be adjusted by a screw to obtain a perfect balance to compensate the weight of the reamer. This is of utmost importance when the machine spindle works horizontally.



Working allowance

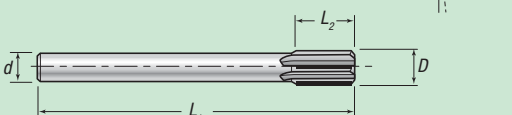


Cutting data for carbide reamers

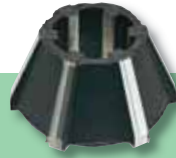
Material	Tensile strength N/mm ²	Cutting speed m/min.	Feed mm/rev.
	Hardness HB		
Steel	< 600	10,0 - 15,0	0,20 - 0,50
Steel	< 1000	5,0 - 12,0	0,10 - 0,40
Stainless steel	> 1000	5,0 - 10,0	0,10 - 0,25
Cast steel	< 500	15,0 - 20,0	0,20 - 0,50
Cast steel	> 500	10,0	0,15 - 0,40
Cast iron	< 200 HB	20,0 - 30,0	0,30 - 0,80
Cast iron	> 200 HB	15,0 - 20,0	0,20 - 0,40
Brass		30,0 - 40,0	0,20 - 0,80
Alu. Alloys		60,0 - 80,0	0,40 - 0,80
Plastic, hard		20,0	0,20 - 0,40

Type 510C Straight Shank Reamer

Solid reamer, straight flutes, differential pitch. Grade ISO K10. Solid carbide tip 4-8 mm, brazed flutes 9-14 mm.



Collets



Type	Jacobs		
	Range mm	For holder type	Part No.
Jacobs	2,8 - 7,0	522	443
Jacobs	7,0 - 13,0	522	440

Spirabor System

Exchangeable within the same system size

Granlunds spirabor is a flexible and cost effective tool system for drilling large holes in different types of metal. Example Steel, Cast iron, Cast steel.

A complete Spirabor consists of a spring steel holder, a cutter head, a roller pilot bush and a retaining pin.

The Cutter head standard program are from 31-100 mm, for specially request up to 200 mm

The diameter range is divided in seven groups, which means that each holder can be useable for several cutter heads in the same group.

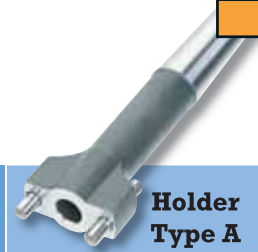


Cutting data			
Speed			
Material	Tensile strength N/mm ²	Speed m/min	
Steel	< 500	15 - 20	
Steel	500-900	10 - 15	
Cast steel		5 - 12	
Cast iron		10 - 15	
Stainless steel		5 - 15	

Feed		
Diameter range mm	Feed mm/rev.	
32 - 45	0,2 - 0,3	
46 - 65	0,3 - 0,4	
66 - 100	0,4 - 0,6	

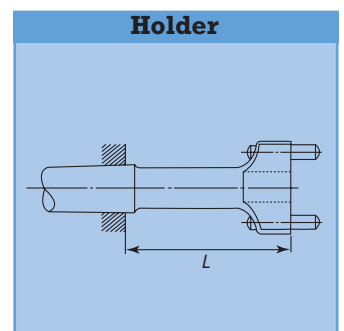
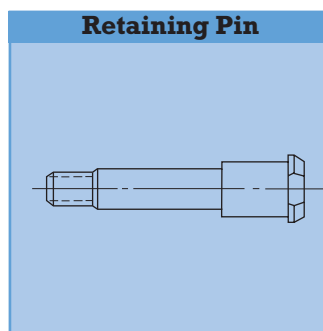
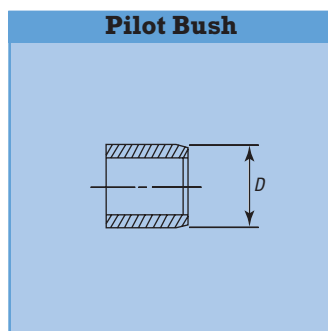
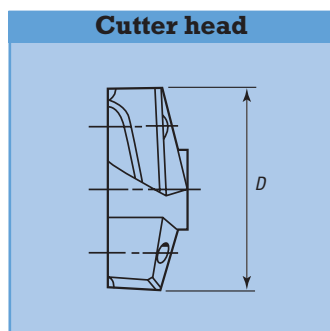
Spirabor System

GRANLUND
Tools



Size	Cutter head Type B		Pilot Bush Type R		Retaining Pin Type RT	Holder Type A		
	D mm tol. h10	Part No.	D mm Tol. c9	Part No.	Part No.	L mm	MT	Part No.
11	32	11B-32	14	11R-14	11RT	65	3	11A-065-MK3
	34	11B-34	15	11R-15		65	4	11A-065-MK4
	35	11B-35	18	11R-18		180	3	11A-180-MK3
	36	11B-36	20	11R-20		180	4	11A-180-MK4
12	38	12B-38	20	12/13R-20	12/13RT	80	3	12A-080-MK3
	39	12B-39	22	12/13R-22		80	4	12A-080-MK4
			24	12/13R-24		200	3	12A-200-MK3
			25	12/13R-25		200	4	12A-200-MK4
13	40	13B-40	20	12/13R-20	12/13RT	80	3	13A-080-MK3
	41	13B-41	22	12/13R-22		80	4	13A-080-MK4
	42	13B-42	24	12/13R-24		200	3	13A-200-MK3
	43	13B-43	25	12/13R-25		200	4	13A-200-MK4
	44	13B-44						
14	45	13B-45						
	46	14B-46	24	14R-24	14RT	90	3	14A-090-MK3
	47	14B-47	25	14R-25		90	4	14A-090-MK4
	48	14B-48	26	14R-26		225	3	14A-225-MK3
	49	14B-49	28	14R-28		225	4	14A-225-MK4
	50	14B-50	30	14R-30				
	51	14B-51						
	52	14B-52						
15	53	15B-53	28	15R-28	15RT	100	4	15A-100-MK4
	54	15B-54	30	15R-30		100	5	15A-100-MK5
	55	15B-55	32	15R-32		250	4	15A-250-MK4
	56	15B-56	35	15R-35		250	5	15A-250-MK5
	57	15B-57	40	15R-40				
	58	15B-58						
	59	15B-59						
	60	15B-60						
	61	15B-61						
	62	15B-62						
	63	15B-63						
	64	15B-64						
16	65	15B-65						
	66	16B-66	32	16R-32	16RT	110	4	16A-110-MK4
	68	16B-68	34	16R-34		110	5	16A-110-MK5
	69	16B-69	35	16R-35		260	4	16A-260-MK4
	70	16B-70	38	16R-38		260	5	16A-260-MK5
	71	16B-71	40	16R-40				
	72	16B-72	50	16R-50				
	74	16B-74						
	75	16B-75						
	76	16B-76						
	77	16B-77						
17	78	16B-78						
	79	16B-79						
	80	16B-80						
	81	16B-81						
	82	17B-82	38	17R-38	17RT	130	4	17A-130-MK4
	84	17B-84	40	17R-40		130	5	17A-130-MK5
	85	17B-85	42	17R-42		280	4	17A-280-MK4
	86	17B-86	45	17R-45		280	5	17A-280-MK5
	88	17B-88	50	17R-50				
	90	17B-90	55	17R-55				
	92	17B-92	60	17R-60				
	94	17B-94	65	17R-65				
95	17B-95	70	17R-70					
96	17B-96	80	17R-80					
98	17B-98							
100	17B-100							

Special dimension available on request.



Single flute End Mill type EF

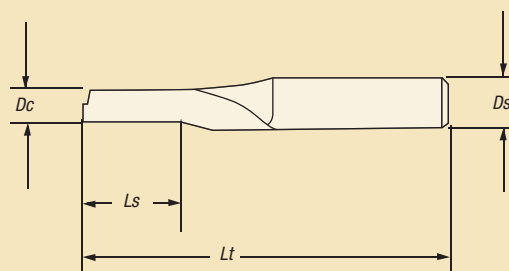
Single flute end mills in solid carbide, for milling, contour-milling and boring in Aluminium, Plastics and Wood. Granlund has developed 3 models: EFT, EFA and EFP (see below).

The single flute mills are recommended for High Speed Cutting. All three models are available in the sizes 4, 5, 6, 8 and 10 mm. Specials are available on request.



Single flute mill type EF

	Dc	Ls	Lt	Ds
	Size mm	Cutting length mm	Total length mm	Shank Ø h6 mm
	4,0	12	57	6
	5,0	14	57	6
	6,0	15	57	6
	8,0	16	58	8
	10,0	18	58	10



EFT-4,5,6,8,10

Description:

Special cutting geometry for wooden materials.
Wide flutes for good chip removal.
Cutting geometry for boring and ramping.

Working range:

Milling, Countour-milling and boring in wood and soft plastics.

EFA-4,5,6,8,10

Description:

Special cutting geometry for Aluminium.
Wide flutes for good chip removal.
Cutting geometry for boring and ramping.

Working range:

Milling, Countour-milling and boring in Aluminium (long chips) and Plastics (Long chips).

EFP-4,5,6,8,10

Description:

Special cutting geometry for Plastics.
Wide flutes for good chip removal.
Cutting geometry for boring and ramping.

Working range:

Milling, Countour-milling and boring in Plastics (short chips) and Aluminium (Short chips).

Special Tools

Granlund Specialverktyg AB offers construction, manufacturing, modifications and regrinding of special tools. Our deliverytimes from order to delivery lies between 1-3 weeks. Some samples of our product line:

Some samples of our product line:

- **Flat drills** – Granlund Specialverktyg manufactures profiled flat drills in HSS, brazed carbide or solid carbide for operations in above all brass and aluminium.
- **Step drills** – We offer tailor made drills and step drills in HSS and solid carbide.
- **Mills** – Mills, radius mills, etc. in HSS, brazed carbide and solid carbide.
- **Reamers** – Reamers, step reamers in HSS, brazed or solid carbide.

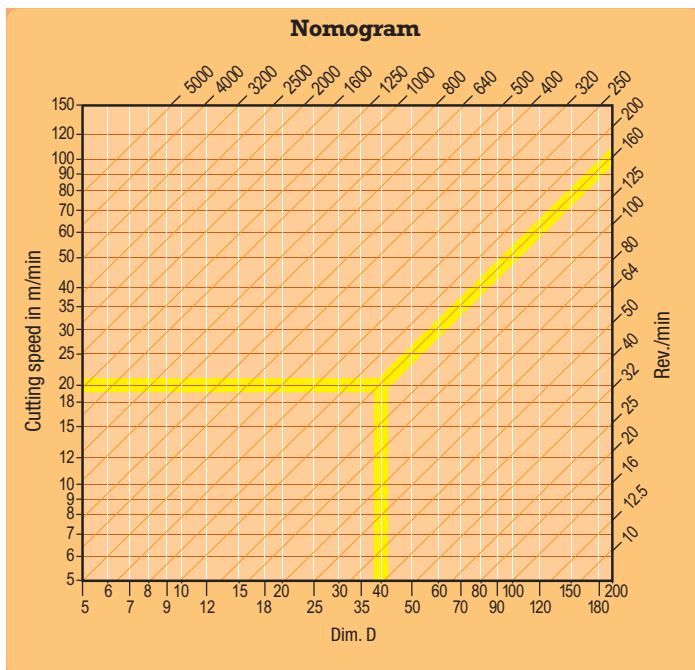
Modifications

We also modify and adjust tools to your need.

Construction

Granlund Specialverktyg also offers construction of your tailor made tools on request.





Type of tools D mm	Spare parts				
	Centre lock		Solid inserts		
	Screw 	Torx key 	Clamp 	Screw 	Key
	Part No.	Part No.	Part No.	Part No.	Part No.
WHV 18,0 - 25,0 KV 20,0 - 25,0 BV 18,0 - 27,0 FV 12,0 - 19,5 DFV 15,0 - 31,0 BFV 15,0 - 31,0			SK-01*	**	SN-1,5*
WHV >25,0 - 34,0 KV >26,0 - 40,0 BV >27,0 - 48,0 FV >19,5 - 30,0	SSK-20	TN-6	SK-3	SSK-3	TN-9
WHV >35,0 - 45,0	SSK-22	TN-7	SK-01*	**	SN-1,5*
WHV >46,0 - KV >41,0 - 60,0	SSK-25	TN-7	SK-2*	**	SN-2,5*
	SSK-40	TN-15			

* Only for type WHV.
** Screw included with clamp. The tools are supplied with clamps, screws and key, centre lock screws and key.

Troubleshooting

	1 Ovality	Reamer off centre of deformed workpiece due to poor fixture of workpiece.		6 Retraction marks	Back taper too large, or reamer off centre.
	2 Deformed hole	Too high feedrate in thinwalled workpiece of poor fixture of workpiece.		7 Too large diameter	Adjusted diameter too large, poor fixture of workpiece.
	3 Curved hole	Axial misalignment of blade.		8 Vibrations at entry	Feedrate too low.
	4 Vibration marks	Too low feedrate or back taper too small.		9 Tapered hole	Reamer off centre, back taper too small.
	5 Poor surface finish	Too high cutting speed, poor coolant pressure, wrong coolant type of poor location of blade.		10 Pick up on pads	Wrong or too weak coolant mixture.

Other products from Granlund

Balancing stand

	Max. diameter of grinding wheel with balance Ø 25 mm	Minimum and maximum length for balancing*	Loading range
500	540 mm	80 - 500 mm	0,3 - 500 kg
800	810 mm	100 - 800 mm	0,3 - 700 kg

* Longer workpieces can be balanced with longer guide bars.



Carbide tipped centres for grinding and turning, Type 610A and 611

Part No.	Type
610A-MT 2	Carbide tipped, turning centre
610A-MT 3	Carbide tipped, turning centre
610A-MT 4	Carbide tipped, turning centre
610A-MT 5	Carbide tipped, turning centre
611-MT 2	Carbide tipped, grinding centre
611-MT 3	Carbide tipped, grinding centre
611-MT 4	Carbide tipped, grinding centre
611-MT 5	Carbide tipped, grinding centre



UNIMETER

- For internal and external precision measurements.
- Indicator reading for comparative measurements.
- Robust, flexible and easy to handle.
- UNIMETER consists of a precision cylinder on which two measuring jaws are placed.
- UNIMETER is set by means of gauge blocks, reference rings or similar to the required gauge size.
- Measuring range can be increased by extension bars.
- UNIMETER can easily be adapted to unique applications.



Other products from Granlund can be ordered at www.granlund.com

GRANLUND

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Granlund Tools AB
Visiting address: Kungsgatan 90 • P.O. Box 377, SE-631 05 Eskilstuna, Sweden
Tel:+46(0)16-16 72 00 • Fax:+46(0)16-16 72 72 • mail@granlund.se • www.granlund.com