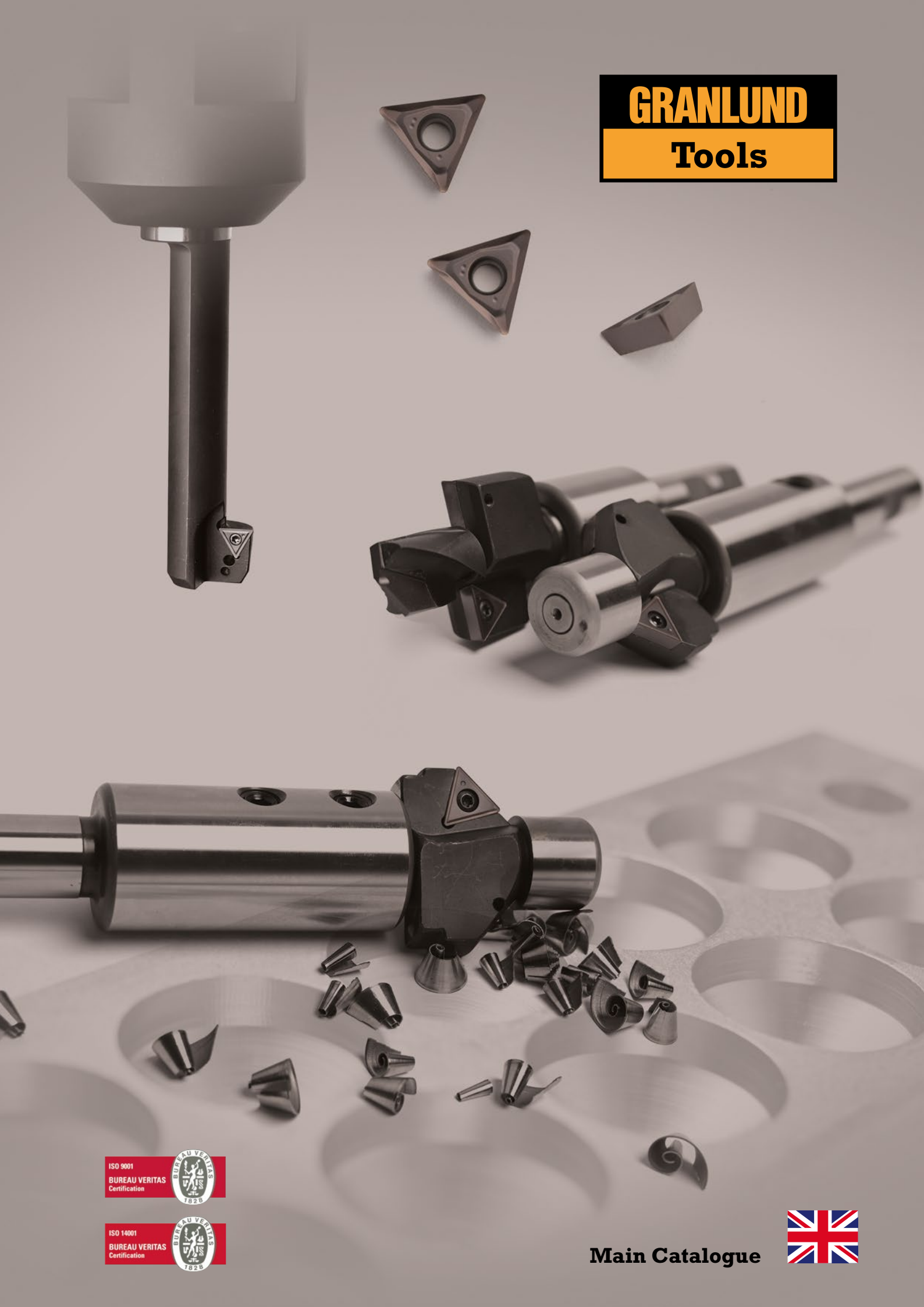


# GRANLUND Tools



ISO 9001  
BUREAU VERITAS  
Certification



ISO 14001  
BUREAU VERITAS  
Certification



Main Catalogue



## Counterbore holders for Magnetic drills type MD

Based on increasing requests, Granlund has developed a 19,05 (3/4") / 90 degree Weldon standard holder, that is the most common holder for Magnetic Drills.

These holders are available in System sizes 0, 1 and 2.



## New inserts type U

The new U (Universal) inserts are produced with a modern coating and a much more wear resistant substrate for universal applications. Beside from normal machining of steel, the insert has been well approved in applications such as HARDOX™ as well as machining of Stainless.



## Long holders with Weldon

After the success with the 1L-500 and 2L-500 cylindrical 500 mm holders, we now fill the gap between those and the longer MT holders.

3 new holders with the length 250 and Weldon are introduced in the series 0, 1 and 2.



0L-250-W16



1L-250-W20



2L-250-W25

## New insets type SA

The new SA-insert for machining of stainless steel and aluminium, has a sharp cutting edge and a coating optimized for machining of stainless.



## New countersink family type 405

The 405 family is a ground 3 flute countersink with differential pitch. This makes the countersink run very smooth with reduced vibrations. It is supplied both as TIN coated as well as uncoated.

Read more about these on page 25.



## New HSS drill for machining of Hardox™

We can now proudly present HSS Drills specially developed for machining of HARDOX™. On the side of our Carbide drill Thunder for HARDOX™, this is a much requested drill, as many operations in HARDOX™ are made in machines that are not suitable for solid carbide tools. The drills are available from 10-40 mm. The drills all have morse taper shank.

More information on page 35.



## ISO Colours highlighting different materials added in charts

In order to enhance the difference between materials in our cutting data tables, we now have applied the ISO colours and symbols, such as P for steel, M for stainless, K for cast iron, etc.

| HSS Feed<br>mm/rev. | Speed<br>m/min | mm/rev.    |                 |
|---------------------|----------------|------------|-----------------|
| 0,05 - 0,3          | 10 - 35        | 0,05 - 0,3 | Steel           |
| 0,05 - 0,3          | 10 - 35        | 0,05 - 0,3 | Cast Steel      |
| 0,05 - 0,3          | 10 - 35        | 0,05 - 0,3 | Stainless Steel |
| 0,05 - 0,3          | 10 - 35        | 0,05 - 0,3 | Cast Iron       |
| 0,05 - 0,3          | 20 - 50        | 0,05 - 0,3 | Malleable Iron  |
| 0,05 - 0,3          | 10 - 35        | 0,05 - 0,3 | Aluminium Soft  |
| 0,05 - 0,3          | 40 - 80        | 0,05 - 0,3 | Copper          |
| 0,05 - 0,3          | 40 - 80        | 0,10 - 0,3 | HARDOX          |

We reserve the right to modify any specification and/or item shown in the present catalogue without notice.

Information, photos, drawings and technical data specified in the publication have been carefully examined and thoroughly checked. They cannot, however, bind our responsibility on their exactness.

GRANLUND TOOLS AB, SWEDEN

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



# Our Story

Many years ago, to be specific in the early 1945, two skilled metalworkers and foremen were laid off their work at a factory in Gävle. The factory had gone bankrupt and now as a last effort it paid out a reasonable end salary to the best foremen they had. The men were Hilmer Granlund and Börje Gyllhamn.

They were now thinking of what to do next. Johan Nordström, a friend of theirs had bought a factory building in Eskilstuna and suggested them to start business, the three of them. Said and done, they moved to Eskilstuna and started GNG (Granlund, Nordström and Gyllhamn).

Business was picking up and they had work 24/7 due to the infinite demand after the war. Unfortunately, Granlund passed away only one year later at the age of 37. Gyllhamn then bought Granlund's GNG shares from his mother. They also changed the name to H. Granlund & Co in honour of Granlund.

In 1948 Gyllhamn acquired the shares from Nordström, (who a couple of years later founded the company Johan Nordström Verktygsmaskiner AB).

In the coming years, the tool business was developing rapidly, and the export accelerated. Today the export stands for more than 70% of the business.

Since 1948 the company has been a fully family-owned business, and now the third generation operates the business.

## Today

Today Granlund Tools is still located in Eskilstuna, Sweden. Granlund is a world-leading manufacturer of precision cutting tools for facing, counterboring, chamfering and backspotfacing. 95% of all tools are manufactured inhouse.

With representation in more than 30 countries, Granlund is a very experienced tool supplier. Granlund has over the years established a well-trimmed and extensive network of distribution as well as a unique and well-established trademark – an obliging trademark!

## One plus one may make more than two

One of Granlund Tools' most known products is the interchangeable counterboring system. With only 1300 parts, consisting of holders, cutters, drills and pilots, it is possible to assemble combination tools in more than 1 500 000 separate variations.

Interchangeability is also applicable for other parts of the Granlund Tools' program. For example by the backspotfacing system, consisting of two parts, and the spirabor system with 4 parts. The interchangeability idea is very important also for the development of new tools. We have indeed experienced that one plus one most often make more than two. Granlunds wide tool program suits both modern and older machines.



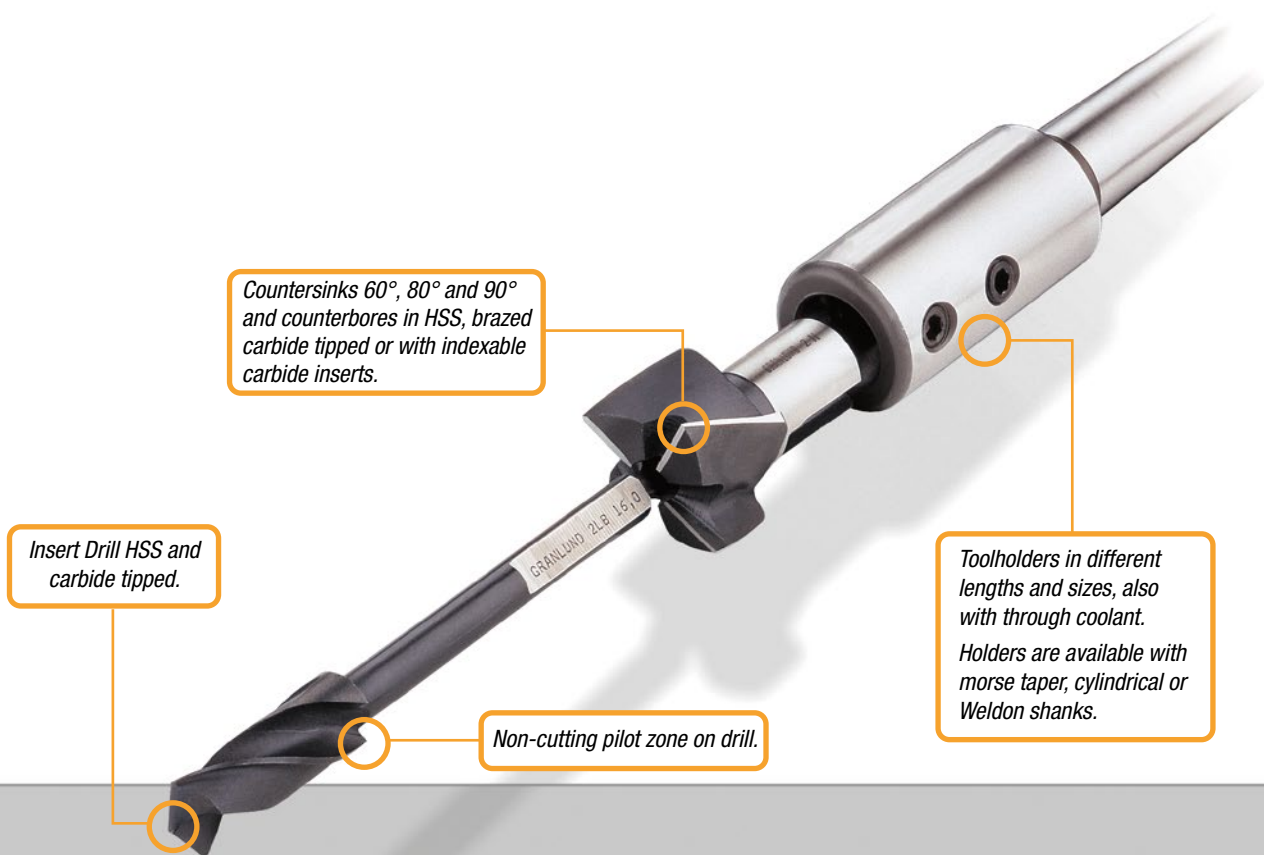
*Standing from left, Johan Nordström and Börje Gyllhamn  
Sitting, Hilmer Granlund - 1945.*



*Eric Gyllhamn, Operational Manager in third generation.*

## Your problem is our challenge

Granlund Tools face problematic machining every day. We have extensive and proven experience with difficult machining, tough materials, advanced special profiles etc. We are proud to say that we are among the best in the world at what we do.



# 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.

|                                                                                     |                                                                                                                                       |                                |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
|    | <b>Granlund Counterboring System..... 6</b>                                                                                           | Counterboring / Countersinking |
|                                                                                     | <b>Counterboring System Size 01 ..... 8</b><br>Insert drills, Pilots, Counterbores, Countersinks, Holders, Sets and Inserts           |                                |
|                                                                                     | <b>Counterboring System Size 0 ..... 10</b><br>Insert drills, Pilots, Counterbores, Countersinks, Holders and Inserts                 |                                |
|                                                                                     | <b>Counterboring System Size 1 ..... 12</b><br>Insert drills, Pilots, Counterbores, Countersinks, Holders and Inserts                 |                                |
|                                                                                     | <b>Counterboring System Size 2 ..... 15</b><br>Insert drills, Pilots, Counterbores, Countersinks, Holders, Inserts and Sets           |                                |
|    | <b>CNC Tools ..... 19</b><br>Counterbores, Boring, Chamfering and Face Milling Tools                                                  | Backspotfacing                 |
|    | <b>Countersinks..... 22</b><br>Countersinks type 100, 405 and type FV                                                                 |                                |
|   | <b>CNC Backspotfacing / Chamfering Tools ..... 25</b><br>CNC Backspotfacers, Back Spotchamfers and Front / Back Spotchamfers, Inserts |                                |
|  | <b>NEPTUNE ..... 26</b><br>Cutting data, Inserts                                                                                      | Reaming                        |
|  | <b>Backspotfacing System ..... 28</b>                                                                                                 |                                |
|  | <b>Single Flute Reamers RD, RA, RB ..... 30</b>                                                                                       | Centres                        |
|  | <b>Carbide Reamers, fixed and re-sizeable ..... 32</b><br>Reamers, Floating toolholders, Collets                                      |                                |
|  | <b>Centres..... 34</b><br>Rotating, Carbide tipped, Turning and grinding Centres                                                      | Drilling                       |
|  | <b>THUNDER ..... 35</b><br>Drill for HARDOX                                                                                           |                                |
|  | <b>HARDOX Drill HSS-Co ..... 35</b>                                                                                                   |                                |
|  | <b>Spirabore, Piloted Drill System ..... 36</b>                                                                                       |                                |
|  | <b>Balancing Stands ..... 37</b>                                                                                                      | Balancing                      |
|  | <b>Technical data ..... 38</b><br>Spare parts, Technical data                                                                         | Technical Data                 |
|  | <b>Special Tools ..... 39</b><br>Special Request form                                                                                 | Special Tools                  |

## 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.



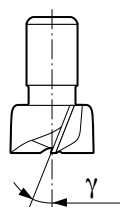
**Insert drills**

**Pilots**

**Counterbores**

**Countersinks**

|           | <b>B</b><br>Ø mm | <b>LB</b><br>Ø mm | <b>BH</b><br>Ø mm | <b>F</b><br>Ø mm | <b>R</b><br>Ø mm | <b>N</b><br>Ø mm | <b>NA</b><br>Ø mm | <b>W</b><br>Ø mm | <b>H</b><br>Ø mm | <b>HA</b><br>Ø mm | <b>WHV</b><br>Ø mm | <b>T</b><br>Ø mm | <b>TH</b><br>Ø mm | <b>TK</b><br>Ø mm | <b>KV</b><br>Ø mm |
|-----------|------------------|-------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|------------------|-------------------|--------------------|------------------|-------------------|-------------------|-------------------|
| <b>01</b> | 2,5-3,7          | 2,5-3,7           |                   | 2,4-8            |                  |                  |                   | 5-16             |                  |                   |                    | 6-10,4           |                   |                   |                   |
| <b>0</b>  | 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             | 18-24              | 8-16,5           |                   |                   | 18-25             |
| <b>1</b>  | 6,5-12           | 6,5-12            | 6,5-12            | 6-6,8            | 7-24             | 10-38            | 10-38             | 10-25            | 12-38            | 12-38             | 20-38              | 11,5-30          | 20-30             | 16,5-34           | 20-30             |
| <b>2</b>  | 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**



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



**Tool holders**

|                  | A          | MD     | M      | NS     | DS | L    | S    | GS   |           |
|------------------|------------|--------|--------|--------|----|------|------|------|-----------|
| Morse Taper      | MK 1       |        |        |        |    |      | MK 1 |      | <b>01</b> |
| Cylindrical Ø mm | 6,0 10,0   |        |        |        | 10 |      | 10   |      |           |
| Morse Taper      | MK 1-2     |        |        |        |    | MK 1 | MK 1 |      | <b>0</b>  |
| Cylindrical Ø mm | 8,0 10,0   |        |        |        | 10 |      | 10   |      |           |
| Weldon           |            | W19,05 |        | W 16   |    | W16  |      |      | <b>1</b>  |
| Morse Taper      | MK 1-2-3   |        | MK 3   | MK 2-3 |    | MK 2 | MK 2 | MK 3 |           |
| Cylindrical Ø mm | 10-12      |        |        |        | 10 | 20   | 10   |      |           |
| Weldon           | W 20       | W19,05 | W 25   | W 20   |    | W20  |      | W 25 | <b>2</b>  |
| Morse Taper      | MK 2-3-4-5 |        | MK 3-4 | MK 3   |    | MK 3 | MK 3 | MK 3 |           |
| Cylindrical Ø mm |            |        |        |        |    | 32   |      |      |           |
| Weldon           | W 20       | W19,05 | W 32   | W 25   |    | W25  |      | W 25 |           |

## Cutting data, counterbores and countersinks



|                                          | N                     | NA                     | W                         | H                          | HA                        | WHV                        | KV*                   | T                      | TK                        | TH                         |                 |
|------------------------------------------|-----------------------|------------------------|---------------------------|----------------------------|---------------------------|----------------------------|-----------------------|------------------------|---------------------------|----------------------------|-----------------|
| Tensile Strength<br>N/mm²<br>Hardness HB | HSS<br>Speed<br>m/min | HSS<br>Feed<br>mm/rev. | Carbide<br>Speed<br>m/min | Carbide<br>Feed<br>mm/rev. | Carbide<br>Speed<br>m/min | Carbide<br>Feed<br>mm/rev. | HSS<br>Speed<br>m/min | HSS<br>Feed<br>mm/rev. | Carbide<br>Speed<br>m/min | Carbide<br>Feed<br>mm/rev. | <b>Material</b> |
| <450 N/mm²                               | 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/mm²                               | 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/mm²                              | 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/mm²                              | 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/mm²                               | 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  |
|                                          | 70 - 150              | 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  |
|                                          | 70 - 120              | 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  |
|                                          | 70 - 120              | 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   |

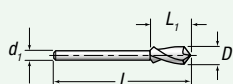
\* Cutting data for type KV = 0,7 x WHV.



| 01<br><br><br><br>Ø<br>mm | Insert drills         |                       | Pilots   |
|---------------------------|-----------------------|-----------------------|----------|
|                           | B                     | LB                    | F        |
|                           | HSS                   | HSS                   |          |
|                           | Tol.h8<br>Flute 12 mm | Tol.h8<br>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             | 01F-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<br>mm  | Counterbores and countersinks |                       |
|----------|-------------------------------|-----------------------|
|          | W                             | T                     |
|          | HSS                           | HSS                   |
|          | Tol.p8<br>Flute 16 mm         | Tol.x9<br>Flute 16 mm |
| Part No. | 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      | 01W-06,7                      | 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     | 01W-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                      |                       |

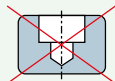
## B and LB



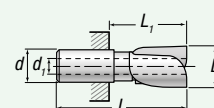
### Important!

- When using insert drills, the drill must drill through before the countersink/countersink starts to cut. Insert drill 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  |

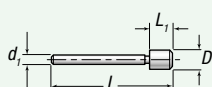


## W



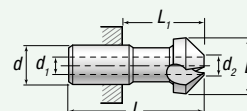
| Type | $d$ | $d_i$ | $L$  | $L_i$ |
|------|-----|-------|------|-------|
| W    | 7,0 | 2,4   | 28,0 | 16,0  |

## F



| Type | $d_i$ | $L$  | $L_i$ |
|------|-------|------|-------|
| F    | 2,4   | 40,0 | 6,0   |

## T



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

# Size 01



| Tool holders |          |
|--------------|----------|
| A            |          |
| Shank        | Part No. |
| MK1          | 01A-MK1  |
| Ø6           | 01A-06   |
| Ø10          | 01A-10   |

| Tool holders             |          |
|--------------------------|----------|
| S                        |          |
| With rotating depth-stop |          |
| Shank                    | Part No. |
| MK1                      | 01S-MK1  |
| Ø10                      | 01S-10   |



| Tool holders |          |
|--------------|----------|
| DS           |          |
| Shank        | Part No. |
| Ø10          | 01DS-10  |



| Set                          |                        |              |
|------------------------------|------------------------|--------------|
| Part No. 01P / M3-M6         |                        |              |
| Counterbores<br>type W, Ø mm | Pilots<br>type F, Ø mm | Tool holders |
| 5,0                          | 2,4                    | 01A-06 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 <sub>1</sub> | Shank |  |
| 01A-MK1 | 14        | 7 | 120 | 58             | MK1   |  |
| 01A-06  | 14        | 7 | 86  | 45             | Ø6    |  |
| 01A-10  | 14        | 7 | 86  | 45             | Ø10   |  |

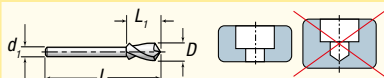
| 01DS    |           |   |    |                |       |  |
|---------|-----------|---|----|----------------|-------|--|
|         |           |   |    |                |       |  |
| Type    | D Tol. g7 | d | L  | L <sub>1</sub> | Shank |  |
| 01DS-10 | 14        | 7 | 54 | 25             | Ø10   |  |

| 01S     |    |   |     |                |                |       |  |
|---------|----|---|-----|----------------|----------------|-------|--|
|         |    |   |     |                |                |       |  |
| Type    | D  | d | L   | L <sub>1</sub> | L <sub>2</sub> | Shank |  |
| 01S-MK1 | 30 | 7 | 120 | 59             | 16             | MK1   |  |
| 01S-10  | 30 | 7 | 88  | 59             | 16             | Ø10   |  |



| Ø<br>mm | Insert drills                          |                       |                           | Pilots   |          | Counterbores and countersinks |          |          |                           |                           |                        |          |                        |
|---------|----------------------------------------|-----------------------|---------------------------|----------|----------|-------------------------------|----------|----------|---------------------------|---------------------------|------------------------|----------|------------------------|
|         | B                                      | LB                    | BH                        | F        | R        | N                             | NA       | W        | H                         | HA                        | WHV                    | T        | KV                     |
|         | HSS                                    | HSS                   | Carbide<br>K20 micrograin | Fixed    | Roller   | HSS                           | HSS      | HSS      | Carbide<br>K40 micrograin | Carbide<br>K10 micrograin | For carbide<br>Inserts | HSS 90°  | For carbide<br>Inserts |
|         | Tol.h8<br>Flute 15 mm                  | Tol.h8<br>Flute 27 mm | Tol.h8<br>Flute 15 mm     | Tol. c9  | Tol. c9  | Tol.p8                        | Tol.p8   | Tol.p8   | Tol.p8                    | Tol.p8                    | Tol.±0,1               | Tol.x9   | +0,2<br>-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.               |
| 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                       |          |          |                           |                           |                        | 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                       |          | OW-10,4  |                           |                           |                        | OT9-10,4 |                        |
| 10,5    |                                        |                       |                           | OF-10,5  | OR-10,5  | ON-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                   |                           |                        |          |                        |
| 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 |          |                           |                           |                        |          |                        |
| 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                   |                           |                        |          |                        |
| 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-16,5                       | ONA-16,5 |          |                           |                           |                        |          |                        |
| 17,5    |                                        |                       |                           |          |          | ON-17,0                       | ONA-17,0 |          | OH-17,0                   |                           |                        |          |                        |
| 18,0    |                                        |                       |                           |          |          | ON-17,5                       | ONA-17,5 |          |                           |                           |                        |          |                        |
| 18,5    |                                        |                       |                           |          |          | ON-18,0                       | ONA-18,0 |          | OH-18,0                   | OHA-18,0                  | OWHV-18,0              |          | OKV9-18,0              |
| 19,0    |                                        |                       |                           |          |          | ON-18,5                       |          |          |                           |                           |                        |          |                        |
| 19,5    |                                        |                       |                           |          |          | ON-19,0                       | ONA-19,0 |          | OH-19,0                   |                           | OWHV-19,0              |          | OKV9-19,0              |
| 20,0    |                                        |                       |                           |          |          | ON-19,5                       |          |          |                           |                           |                        |          |                        |
| 20,5    |                                        |                       |                           |          |          | ON-20,0                       | ONA-20,0 |          | OH-20,0                   | OHA-20,0                  | OWHV-20,0              |          | OKV9-20,5              |
| 21,0    |                                        |                       |                           |          |          | ON-20,5                       | ONA-20,5 |          |                           |                           |                        |          |                        |
| 21,5    |                                        |                       |                           |          |          | ON-21,0                       | ONA-21,0 |          | OH-21,0                   |                           | OWHV-21,0              |          |                        |
| 22,0    |                                        |                       |                           |          |          | ON-21,5                       | ONA-21,5 |          |                           |                           |                        |          |                        |
| 22,5    |                                        |                       |                           |          |          | ON-22,0                       | ONA-22,0 |          | OH-22,0                   | OHA-22,0                  | OWHV-22,0              |          |                        |
| 23,0    |                                        |                       |                           |          |          | ON-22,5                       | ONA-22,5 |          |                           |                           |                        |          |                        |
| 23,5    |                                        |                       |                           |          |          | ON-23,0                       | ONA-23,0 |          | OH-23,0                   |                           | OWHV-23,0              |          |                        |
| 24,0    |                                        |                       |                           |          |          | ON-23,5                       | ONA-23,5 |          |                           |                           |                        |          |                        |
| 24,0    |                                        |                       |                           |          |          | ON-24,0                       | ONA-24,0 |          | OH-24,0                   | OHA-24,0                  | OWHV-24,0              |          |                        |
| 25,0    |                                        |                       |                           |          |          |                               |          |          |                           |                           |                        |          | OKV9-25,0              |

## B, LB and BH

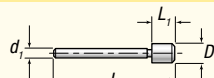


| Type  | $d_1$ | $L$  | $L_1$ |
|-------|-------|------|-------|
| B, BH | 4,0   | 70,0 | 15,0  |
| LB    | 4,0   | 82,0 | 27,0  |

## Important!

- When using insert drills, the drill must drill through before the countersink/countersink starts to cut. Insert drill must not be used in blind holes.

## F and R

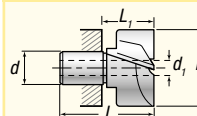


| Type | $d_1$ | $L$  | $L_1$ |
|------|-------|------|-------|
| F, R | 4,0   | 64,0 | 9,0   |

## Important!

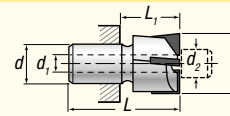
- When working "dry" type R roller pilots must be lubricated.

## N, NA och W

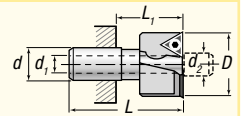


| Type      | $d$  | $d_1$ | $d_{2min}$ | $L$  | $L_1$ |
|-----------|------|-------|------------|------|-------|
| N, NA, W  | 10,0 | 4,0   |            | 40,0 | 22,0  |
| H, HA, WH | 10,0 | 4,0   | 5,8        | 40,0 | 22,0  |
| WHV       | 10,0 | 4,0   | 5,2        | 40,0 | 22,0  |

## H and HA



## WHV



## Important!

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

# Size 0

**GRANLUND**  
Tools



## Tool holders

### A

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

## Tool holders

### NS and DS Short

| Shank  | Part No. |
|--------|----------|
| Weldon |          |
| W16    | 0NS-W16  |
| Ø10    | 0DS-10   |

## Tool holders

### L Long

| Shank  | Part No.   |
|--------|------------|
| MK1    |            |
| L100   | 0L-100-MK1 |
| L150   | 0L-150-MK1 |
| L200   | 0L-200-MK1 |
| Weldon | 0L-250-W25 |

## Tool holders

### S With rotating depthstop

| Shank | Part No. |
|-------|----------|
| MK1   | 0S-MK1   |
| Ø10   | 0S-10    |

## Tool holders

### MD Magnetic drills

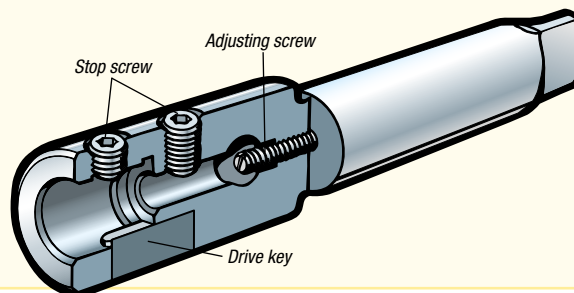
| Shank  | Part No. |
|--------|----------|
| W19,05 | 0MD      |

## 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.



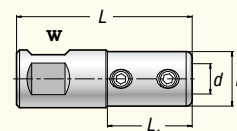
## Insert for WHV and KV



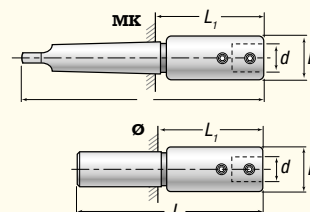
| Type of insert     | Size | Part No.  | Part No. | Radius | Suitable for | SSK |
|--------------------|------|-----------|----------|--------|--------------|-----|
| Type of tools D mm |      |           |          |        |              |     |
| WHV 18,0 - 20,0    | 07   | TPMT-07U  | TPMR-07U | 0,4    | Universal    | 20  |
| KV 20,0 - 25,0     | 07   | TPMT-07SA | TPMR-07U | 0,4    | HARDOX       |     |
|                    | 07   | TPMT-07SA |          | 0,4    | Stainless    |     |
|                    | 07   | TPMT-07SA |          | 0,4    | Aluminium    |     |

- The GRANLUND inserts have special chipbreaker angle for optimum chip control.

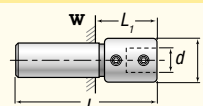
## 0MD



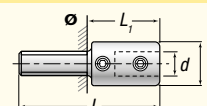
## 0A



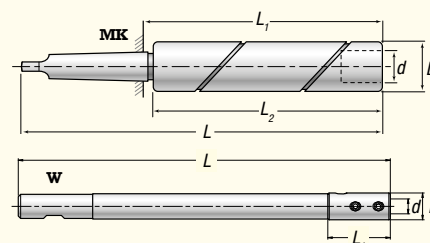
## 0NS



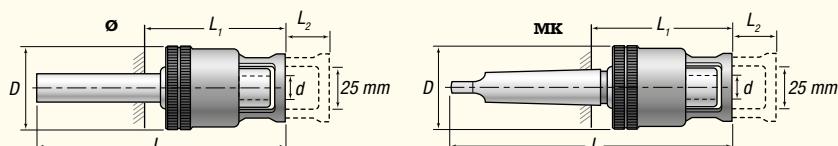
## 0DS



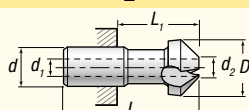
## 0L



## 0S

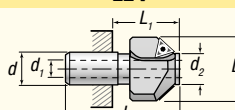


## T



| Type | d    | d <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
|------|------|----------------|-------------------|------|----------------|
| T    | 10,0 | 4,0            | 4,5               | 40,0 | 22,0           |

## KV



| Type | d    | d <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
|------|------|----------------|-------------------|------|----------------|
| KV   | 10,0 | 4,0            | 10,5              | 40,0 | 22,0           |

## Important!

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

| Type       | D Tol. g7 | d  | L   | L <sub>1</sub> | L <sub>2</sub> | Shank  |
|------------|-----------|----|-----|----------------|----------------|--------|
| 0A-MK1     | 18        | 10 | 110 | 48             |                | MK1    |
| 0A-MK2     | 18        | 10 | 132 | 57             |                | MK2    |
| 0A-08      | 18        | 10 | 92  | 42             |                | Ø8     |
| 0A-10      | 18        | 10 | 92  | 42             |                | Ø10    |
| 0S-MK1     | 37        | 10 | 114 | 53             | 18             | MK1    |
| 0S-10      | 37        | 10 | 96  | 53             | 18             | Ø10    |
| 0L-100-MK1 | 20        | 10 | 168 | 106            | 100            | MK1    |
| 0L-150-MK1 | 20        | 10 | 218 | 156            | 150            | MK1    |
| 0L-200-MK1 | 20        | 10 | 268 | 206            | 200            | MK1    |
| 0L-250-W16 | 18        | 10 | 250 | 42             |                | W16    |
| 0NS-W16    | 18        | 10 | 80  | 28             |                | W16    |
| 0DS-10     | 18        | 10 | 58  | 30             |                | Ø10    |
| 0MD        | 18        | 10 | 58  | 28             |                | W19,05 |

# Size 1

**GRANLUND**  
Tools



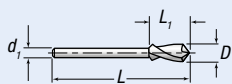
| Ø<br>mm | Insert drills         |                       |                           | Pilots   |          |
|---------|-----------------------|-----------------------|---------------------------|----------|----------|
|         | B                     | LB                    | BH                        | F        | R        |
|         | HSS                   | HSS                   | Carbide<br>K20 micrograin | Fixed    | Roller   |
|         | Tol.h8<br>Flute 25 mm | Tol.h8<br>Flute 40 mm | Tol.h8<br>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  |
| 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<br>mm | Counterbores |           |          |                           |                           |                        |
|---------|--------------|-----------|----------|---------------------------|---------------------------|------------------------|
|         | N            | NA        | W        | H                         | HA                        | WHV                    |
|         | HSS          | HSS       | HSS      | Carbide<br>K40 micrograin | Carbide<br>K10 micrograin | For carbide<br>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  |          |                           | 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                  | 1WHV-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                  | 1WHV-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                  | 1WHV-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    | 1N-29,5      | 1NA-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*                 | 1WHV-30,5              |
| 31,0    | 1N-31,0*     | 1NA-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*                 | 1WHV-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*                 | 1WHV-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*                 | 1WHV-37,0              |
| 38,0    | 1N-38,0*     | 1NA-38,0* |          | 1H-38,0*                  | 1HA-38,0*                 | 1WHV-38,0              |

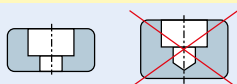
## B, LB and BH



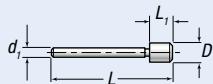
| Type  | d <sub>1</sub> | L     | L <sub>1</sub> |
|-------|----------------|-------|----------------|
| B, BH | 6,0            | 95,0  | 25,0           |
| LB    | 6,0            | 110,0 | 40,0           |

### Important!

- When using insert drills, the drill must drill through before the countersink/countersink starts to cut. Insert drill must not be used in blind holes.



## F and R/RS



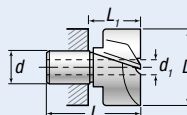
| Type | d <sub>1</sub> | L    | L <sub>1</sub> |
|------|----------------|------|----------------|
| F, R | 6,0            | 80,0 | 14,0           |

\* 1R < Ø10 mm, L1=9,0 mm

### Important!

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

## N, NA and W

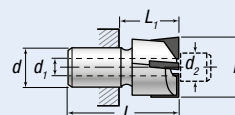


| Type      | d    | d <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
|-----------|------|----------------|-------------------|------|----------------|
| N, NA, W  | 14,0 | 6,0            |                   | 48,0 | 28,0           |
| H, HA, WH | 14,0 | 6,0            | 8,0               | 48,0 | 28,0           |

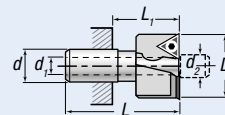
### Important!

- 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



## WHV



| Type | d    | d <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
|------|------|----------------|-------------------|------|----------------|
| WHV  | 14,0 | 6,0            | 7,6               | 48,0 | 28,0           |

### Important!

- The counterbore WHV Rotatip should always be used combined with 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

**GRANLUND**  
Tools

| 1    | 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°    |
| Ø mm | 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   | 1KV9-20,0           |
| 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   |                     |

| Tool holders |          |
|--------------|----------|
| A            |          |
| Shank        | Part No. |
| MK1          | 1A-MK1   |
| MK2          | 1A-MK2   |
| MK3          | 1A-MK3   |
| Ø10          | 1A-10    |
| Ø12          | 1A-12    |
| Weldon       | 1A-W20   |

| Tool holders    |          |
|-----------------|----------|
| NS and DS Short |          |
| Shank           | Part No. |
| MK2             | 1NS-MK2  |
| MK3             | 1NS-MK3  |
| Weldon          | 1NS-W20  |
| Ø10             | 1DS-10   |

| Insert for WHV and KV       |      |           |          |        |              |     |
|-----------------------------|------|-----------|----------|--------|--------------|-----|
| Type of insert              |      |           |          |        |              |     |
| Type of tools D mm          | Size | Part No.  | Part No. | Radius | Suitable for | SSK |
| WHV 20,0 - 25,0<br>KV 20-26 | 07   | TPMT-07U  | TPMR-07U | 0,4    | Universal    | 20  |
|                             | 07   |           | TPMR-07U | 0,4    | HARDOX       |     |
|                             | 07   | TPMT-07SA |          | 0,4    | Stainless    |     |
|                             | 07   | TPMT-07SA |          | 0,4    | Aluminium    |     |
| WHV 25,5 - 38,0<br>KV 30,0  | 10   | TPMT-10U  |          | 0,4    | Universal    | 22  |
|                             | 10   | TPMT-10U  |          | 0,4    | HARDOX       |     |
|                             | 10   | TPMT-10SA |          | 0,4    | Stainless    |     |
|                             | 10   | TPMT-10SA |          | 0,4    | Aluminium    |     |

- The GRANLUND inserts have special chipbreaker angle for optimum chip control.

| T, TH and TK |      |                |                   |      |                | KV       |      |                |                   |      |                |
|--------------|------|----------------|-------------------|------|----------------|----------|------|----------------|-------------------|------|----------------|
|              |      |                |                   |      |                |          |      |                |                   |      |                |
| Type         | d    | d <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> | Type     | d    | d <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
| 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 roller pilots. Minimum shank size is MK3.

| 1MD  |           |    |    |                |        |
|------|-----------|----|----|----------------|--------|
|      |           |    |    |                |        |
| Type | D Tol. g7 | d  | L  | L <sub>1</sub> | Shank  |
| 1MD  | 24        | 14 | 62 | 32             | W19,05 |

# Size 1

**GRANLUND**  
T

## Tool holders

### L

Long

| Shank  | Part No.   |
|--------|------------|
| MK2    | 1L-100-MK2 |
| MK2    | 1L-150-MK2 |
| MK2    | 1L-225-MK2 |
| Weldon | 1L-250-W20 |
| Ø20    | 1L-500-20  |

## Tool holders

### GS

With through coolant

| Shank  | Part No. |
|--------|----------|
| MK3    | 1GS-MK3  |
| Weldon | 1GS-W25  |

## Tool holders

### S

With rotating depthstop

| Shank | Part No. |
|-------|----------|
| MK2   | 1S-MK2   |
| Ø10   | 1S-10    |

## Tool holders

### M

Slotted drive

| Shank | Part No. |
|-------|----------|
| MK3   | 1M-MK3   |
| W25   | 1M-W25   |

## Tool holders

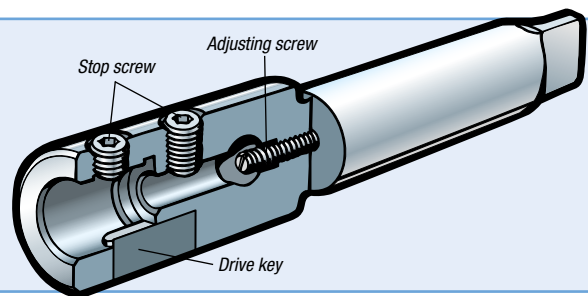
### MD

Magnetic drills

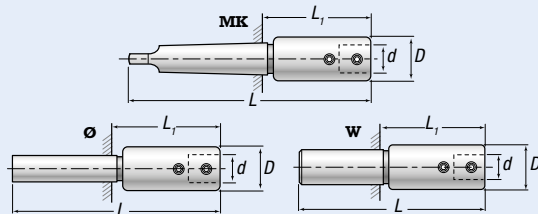
| Shank  | Part No. |
|--------|----------|
| W19,05 | 1MD      |

## Important!

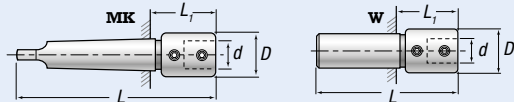
- When using carbide cutters – types TH, H and HA – set the axial adjusting screw to contact the shank of inserted pilot or drill.
- Allow a gap between the shoulder of the pilot/drill and the carbide cutting edges to prevent damage by accidental impact.
- The adjusting screw is also used to extend the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



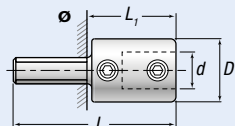
## 1A



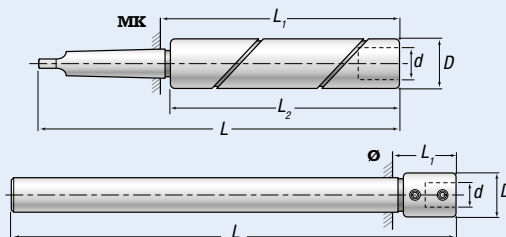
## 1NS



## 1DS

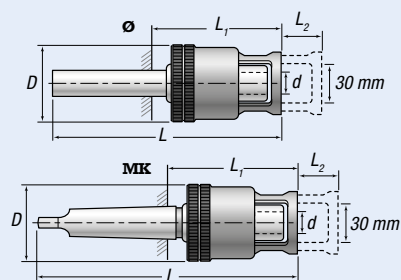


## 1L

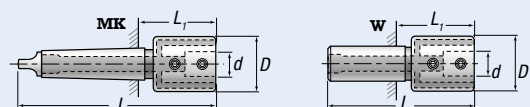


| Type       | D Tol. g7 | d  | L   | L <sub>1</sub> | L <sub>2</sub> | Shank |
|------------|-----------|----|-----|----------------|----------------|-------|
| 1A-MK1     | 24        | 14 | 123 | 62             |                | MK1   |
| 1A-MK2     | 24        | 14 | 137 | 62             |                | MK2   |
| 1A-MK3     | 24        | 14 | 160 | 66             |                | MK3   |
| 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             |                | MK2   |
| 1NS-MK3    | 24        | 14 | 130 | 37             |                | MK3   |
| 1NS-W20    | 24        | 14 | 86  | 32             |                | W20   |
| 1DS-10     | 24        | 14 | 62  | 34             |                | Ø10   |
| 1L-100-MK2 | 26        | 14 | 183 | 108            | 100            | MK2   |
| 1L-150-MK2 | 26        | 14 | 233 | 158            | 150            | MK2   |
| 1L-250-W20 | 24        | 14 | 250 | 55             |                | W20   |
| 1L-225-MK2 | 26        | 14 | 308 | 233            | 225            | MK2   |
| 1L-500-20  | 24        | 14 | 500 | 55             |                | Ø20   |

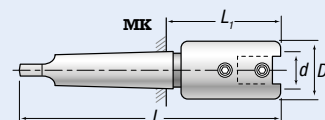
## 1S



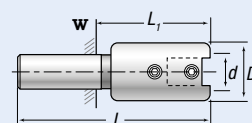
## 1GS



## 1M



## 1M-W25



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

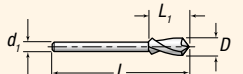
# Size 2

**GRANLUND**  
Tools



| Ø mm     | Insert drills                          |                        |                        | Pilots   |          |
|----------|----------------------------------------|------------------------|------------------------|----------|----------|
|          | B                                      | LB                     | BH                     | F        | R        |
|          | HSS                                    | HSS                    | Carbide K20 micrograin | Fixed    | Roller   |
|          | Tol. h8<br>Flute 30 mm                 | Tol. h8<br>Flute 50 mm | Tol. h8<br>Flute 30 mm | Tol. c9  | Tol. c9  |
| Part No. | 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  |

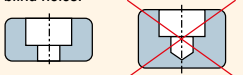
## B, LB and BH



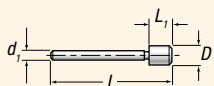
| Type  | d <sub>1</sub> | L     | L <sub>1</sub> |
|-------|----------------|-------|----------------|
| B, BH | 10,0           | 125,0 | 30,0           |
| LB    | 10,0           | 145,0 | 50,0           |

### Important!

- When using insert drills, the drill must drill through before the countersink/counterbore starts to cut. Insert drill must not be used in blind holes.



## F and R



| Type | d <sub>1</sub> | L     | L <sub>1</sub> |
|------|----------------|-------|----------------|
| F, R | 10,0           | 110,0 | 20,0           |

\*2R < Ø13 mm, L1=14,0 mm

### Important!

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

| 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.               | Part No.            |
| 16,0     | 2N-16,0      | 2NA-16,0  | 2W-16,0  |                        |                        |                     |
| 16,5     | 2N-16,5      |           |          |                        |                        |                     |
| 17,0     | 2N-17,0      | 2NA-17,0  |          |                        |                        |                     |
| 17,5     | 2N-17,5      |           |          |                        |                        |                     |
| 18,0     | 2N-18,0      | 2NA-18,0  | 2W-18,0  | 2H-18,0                | 2HA-18,0               |                     |
| 18,5     | 2N-18,5      |           |          |                        |                        |                     |
| 19,0     | 2N-19,0      | 2NA-19,0  | 2W-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      |           |          |                        |                        |                     |
| 21,0     | 2N-21,0      | 2NA-21,0  |          | 2H-21,0                |                        |                     |
| 21,5     | 2N-21,5      |           |          |                        |                        |                     |
| 22,0     | 2N-22,0      | 2NA-22,0  | 2W-22,0  | 2H-22,0                | 2HA-22,0               |                     |
| 22,5     | 2N-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      |           |          |                        |                        |                     |
| 24,0     | 2N-24,0      | 2NA-24,0  | 2W-24,0  | 2H-24,0                |                        |                     |
| 24,5     | 2N-24,5      |           |          |                        |                        |                     |
| 25,0     | 2N-25,0      | 2NA-25,0  | 2W-25,0  | 2H-25,0                | 2HA-25,0               |                     |
| 25,5     | 2N-25,5      |           |          |                        |                        |                     |
| 26,0     | 2N-26,0      | 2NA-26,0  | 2W-26,0  | 2H-26,0                | 2HA-26,0               |                     |
| 26,5     | 2N-26,5      |           |          |                        |                        |                     |
| 27,0     | 2N-27,0      | 2NA-27,0  | 2W-27,0  | 2H-27,0                |                        |                     |
| 27,5     | 2N-27,5      |           |          |                        |                        |                     |
| 28,0     | 2N-28,0      | 2NA-28,0  | 2W-28,0  | 2H-28,0                | 2HA-28,0               |                     |
| 28,5     | 2N-28,5      |           |          |                        |                        |                     |
| 29,0     | 2N-29,0      | 2NA-29,0  | 2W-29,0  | 2H-29,0                | 2HA-29,0               |                     |
| 29,5     | 2N-29,5      |           |          |                        |                        |                     |
| 30,0     | 2N-30,0      | 2NA-30,0  | 2W-30,0  | 2H-30,0                | 2HA-30,0               |                     |
| 30,5     | 2N-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                |                        | 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                |                        | 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                |                        | 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      |           |          |                        | 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  |          |                        |                        | 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* |          |                        |                        | 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* |          |                        |                        | 2WHV-53,0**         |
| 54,0     | 2N-54,0*     | 2NA-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* |          |                        |                        |                     |
| 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*               |                        |                     |
| 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*     |           |          |                        |                        |                     |
| 84,0     |              | 2NA-84,0* |          |                        |                        |                     |
| 85,0     | 2N-85,0*     | 2NA-85,0* |          |                        |                        |                     |

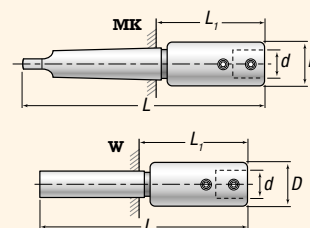
\* Use holders type M.

\*\* Recommended minimum shank size MT3.

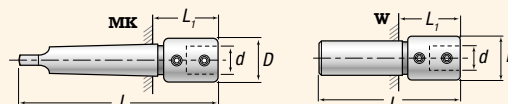


| 2 Countersinks |                |                |                |                 |                |                        |                        |
|----------------|----------------|----------------|----------------|-----------------|----------------|------------------------|------------------------|
| Ø<br>mm        | T              | T              | T              | TH              | TK             | KV                     | KV                     |
|                | HSS            | HSS            | HSS            | Carbide<br>K 10 | HSS            | For carbide<br>inserts | For carbide<br>inserts |
|                | Tol. x9<br>60° | Tol. x9<br>80° | Tol. x9<br>90° | Tol. x9<br>90°  | Tol. x9<br>90° | Tol. + 0,2-0<br>60°    | Tol. + 0,2-0<br>90°    |
|                | Part No.       | Part No.       | Part No.       | Part No.        | Part No.       | Part No.               | 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       |                 |                |                        | 2KV9-35,0              |
| 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      |                        | 2KV9-45,0              |
| 46,0           |                |                |                |                 |                |                        |                        |
| 47,0           |                |                |                |                 |                |                        |                        |
| 48,0           |                |                |                |                 |                |                        |                        |
| 50,0           | 2T6-50,0       |                | 2T9-50,0       | 2TH9-50,0       | 2TK9-50,0      | 2KV6-50,0              | 2KV9-50,0              |
| 51,0           |                |                |                |                 |                |                        |                        |
| 52,0           |                |                |                |                 |                |                        |                        |
| 53,0           |                |                |                |                 |                |                        |                        |
| 55,0           |                |                |                |                 |                |                        |                        |
| 56,0           |                |                |                |                 |                |                        |                        |
| 58,0           |                |                |                |                 |                |                        |                        |
| 60,0           | 2T6-60,0       |                | 2T9-60,0       | 2TH9-60,0       | 2TK9-60,0      | 2KV6-60,0              | 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       |                 |                |                        |                        |

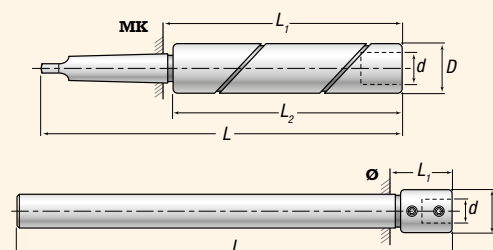
## 2A



## 2NS

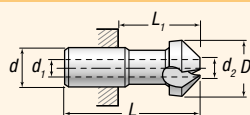


## 2L



| Type        | D Tol. g7 | d  | L   | L <sub>1</sub> | L <sub>2</sub> | Shank  |
|-------------|-----------|----|-----|----------------|----------------|--------|
| 2A-MK2      | 36        | 22 | 160 | 85             |                | MK2    |
| 2A-MK3      | 36        | 22 | 180 | 87             |                | MK3    |
| 2A-MK4      | 36        | 22 | 206 | 89             |                | MK4    |
| 2A-MK5      | 36        | 22 | 240 | 91             |                | MK5    |
| 2A-W20      | 36        | 22 | 140 | 71             |                | W20    |
| 2NS-MK3     | 36        | 22 | 145 | 51             |                | MK3    |
| 2NS-W25     | 36        | 22 | 105 | 45             |                | W25    |
| 2L-L250-MK3 | 40        | 22 | 355 | 261            | 250            | MK3    |
| 2L-L250-W25 | 40        | 22 | 250 | 75             |                | Weldon |
| 2L-500-32   | 36        | 22 | 500 | 51             |                | Ø32    |

## T, TH and TK

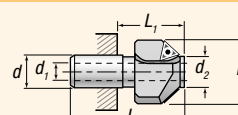


### Important!

- 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 <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
|-------------|------|----------------|-------------------|------|----------------|
| 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 (Ø60)    | 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 roller pilots. Minimum shank size is MK3.

| Type         | d    | d <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
|--------------|------|----------------|-------------------|------|----------------|
| KV (Ø32)     | 22,0 | 10,0           | 17,0              | 61,0 | 33,0           |
| KV (Ø35)     | 22,0 | 10,0           | 18,0              | 61,0 | 33,0           |
| KV (Ø38)     | 22,0 | 10,0           | 18,0              | 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           |
| KV9 (Ø50,60) | 22,0 | 10,0           | 22,0              | 61,0 | 33,0           |
| KV6 (Ø50)    | 22,0 | 10,0           | 29,0              | 61,0 | 33,0           |
| KV6 (Ø60)    | 22,0 | 10,0           | 33,0              | 61,0 | 33,0           |

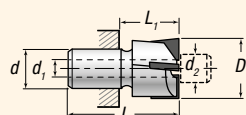
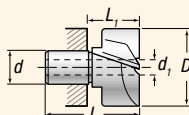
## N, NA and W

## H and HA

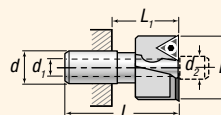
## WHV

### 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 <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
|-----------|------|----------------|-------------------|------|----------------|
| 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 <sub>1</sub> | d <sub>2min</sub> | L    | L <sub>1</sub> |
|-----------|------|----------------|-------------------|------|----------------|
| 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 Rotatip should always be used combined with type R roller pilots. The shank of the holder must not be smaller than MT3.

## Size 2



**Tool holders**

### A

| Shank  | Part No. |
|--------|----------|
| MK2    | 2A-MK2   |
| MK3    | 2A-MK3   |
| MK4    | 2A-MK4   |
| MK5    | 2A-MK5   |
| Weldon | 2A-W20   |



**Tool holders**

### NS Short

| Shank  | Part No. |
|--------|----------|
| MK3    | 2NS-MK3  |
| Weldon | 2NS-W25  |



**Tool holders**

### L Long

| Shank  | Part No.   |
|--------|------------|
| MK3    | 2L-250-MK3 |
| Weldon | 2L-250-W25 |
| Ø32    | 2L-500-32  |



**Tool holders**

### GS

With through coolant

| Shank  | Part No. |
|--------|----------|
| MK3    | 2GS-MK3  |
| Weldon | 2GS-W25  |



**Tool holders**

### S

With rotating depthstop

| Shank | Part No. |
|-------|----------|
| MK3   | 2S-MK3   |

### Insert for WHV and KV



| Type of insert         | Size | Part No.  | Part No. | Radius | Suitable for | SSK |
|------------------------|------|-----------|----------|--------|--------------|-----|
| KV 32,0-41,0           | 10   | TPMT-10U  |          | 0,4    | Universal    | 22  |
|                        | 10   | TPMR-10U  |          | 0,4    | HARDOX       |     |
|                        | 10   | TPMT-10SA |          | 0,4    | Stainless    |     |
|                        | 10   | TPMT-10SA |          | 0,4    | Aluminium    |     |
| WHV 34,0-45,0<br>KV 45 | 12   | TPMT-12U  |          | 0,8    | Universal    | 25  |
|                        | 12   | TPMT-12U  |          | 0,8    | HARDOX       |     |
|                        | 12   | TPMT-12M  |          | 0,8    | Stainless    |     |
|                        | 12   | TPMT-12K  |          | 0,8    | Aluminium    |     |
| WHV 46,0-<br>KV 50-    | 17   | TPMT-17U  |          | 0,8    | Universal    | 40  |
|                        | 17   | TPMT-17U  |          | 0,8    | HARDOX       |     |
|                        | 17   | TPMT-17M  |          | 0,8    | Stainless    |     |
|                        | 17   | TPMT-17K  |          | 0,8    | Aluminium    |     |

• The GRANLUND inserts have special chipbreaker angle for optimum chip control.



**Tool holders**

### M

Slotted drive

| Shank | Part No. |
|-------|----------|
| MK3   | 2M-MK3   |
| MK4   | 2M-MK4   |
| W32   | 2M-W32   |



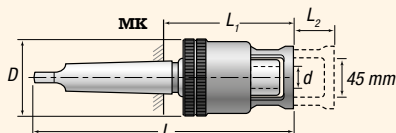
**Tool holders**

### MD

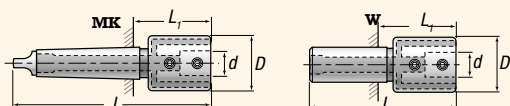
Magnetic drills

| Shank  | Part No. |
|--------|----------|
| W19,05 | 2MD      |

### 2S

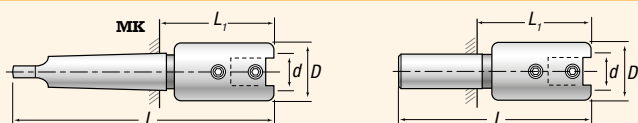


### 2GS



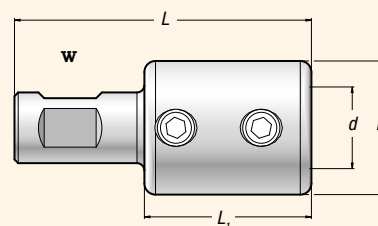
### 2M

### 2M-W32



| Type    | D Tol. g7 | d  | L   | L <sub>1</sub> | L <sub>2</sub> | Shank |
|---------|-----------|----|-----|----------------|----------------|-------|
| 2S-MK3  | 63        | 22 | 187 | 94             | 25             | MK3   |
| 2GS-MK3 | 44        | 22 | 154 | 61             |                | MK3   |
| 2GS-W25 | 44        | 22 | 115 | 51             |                | W25   |
| 2M-MK3  | 48        | 22 | 187 | 93             |                | MK3   |
| 2M-MK4  | 48        | 22 | 212 | 95             |                | MK4   |
| 2M-W32  | 48        | 22 | 148 | 88             |                | W32   |

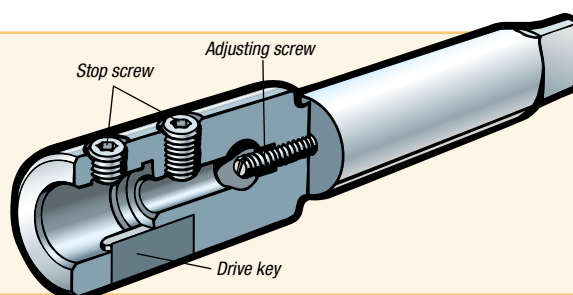
### 2MD



| Type | D Tol. g7 | d  | L  | L <sub>1</sub> | Shank  |
|------|-----------|----|----|----------------|--------|
| 2MD  | 36        | 22 | 80 | 45             | W19,05 |

### 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.



# Counterbore Sets

**GRANLUND**  
Tools



**Set**

## Part No. 0P / M4-M8

| Counterbores<br>type N, Ø mm | Pilots<br>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                    |              |
|                              | 8,5                    |              |
|                              | 9,0                    |              |
|                              | 10,0                   |              |



**Set**

## Part No. 0D / M4-M12

| Counterbores<br>type N, Ø mm | Pilots<br>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.



**Set**

## Part No. 1P / M8-M14

| Counterbores<br>type N, Ø mm | Pilots<br>type F, Ø mm | Tool holders |
|------------------------------|------------------------|--------------|
| 14,0                         | 8,0                    | 1A-MK2       |
| 15,0                         | 8,5                    |              |
| 16,0                         | 9,0                    |              |
| 18,0                         | 9,5                    |              |
| 20,0                         | 10,0                   |              |
| 22,0                         | 10,5                   |              |
| 24,0                         | 11,0                   |              |
|                              | 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<br>type N, Ø mm | Pilots<br>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

### Important!

\* Counterbore Set 01P can be found on page 9 in this catalog.



**Set**

## Part No. 2P / M14-M24

| Counterbores<br>type N, Ø mm | Pilots<br>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**

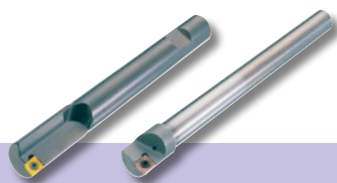
## Part No. 2D / M14-M24

| Counterbores<br>type N, Ø mm | Pilots<br>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.

# CNC Tools, sizes and dimensions

**GRANLUND**  
Tools



**FA, FAH**  
Boring Tool

| D mm | Part No. | d <sub>1</sub> | L   | L <sub>1</sub> | 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                 |



**FAE**  
Boring and Chamfering Tool

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



**ES**  
Collet

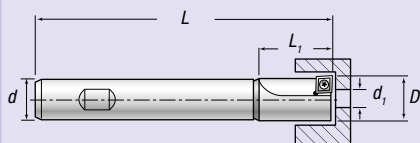
| D mm | Part No. | d  | L  | L <sub>1</sub> | D <sub>1</sub> | h  |
|------|----------|----|----|----------------|----------------|----|
| 25,0 | ES-25-08 | 8  | 61 | 56             | 29             | 23 |
| 25,0 | ES-25-10 | 10 | 61 | 56             | 29             | 23 |
| 25,0 | ES-25-12 | 12 | 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 |

| D mm | Part No. | d <sub>1</sub> | L   | L <sub>1</sub> | L <sub>2</sub> | 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                 |

With ES to FA, FAH and FAE the diameter (D) can be adjusted  $\pm 0,5$  mm.

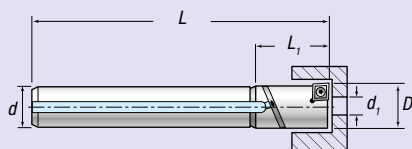
**FA**

Boring tool with steel shank.  
DIN1835B.



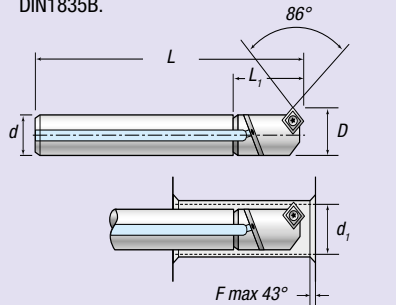
**FAH**

Boring tool with solid carbide shank and through coolant.



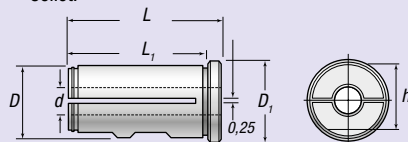
**FAE**

Boring and chamfering tool with solid carbide shank and through coolant.  
DIN1835B.



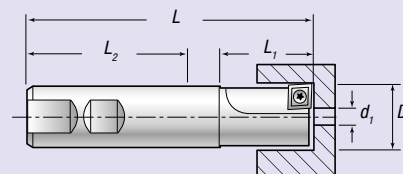
**ES**

Collet.



**FM**

Counterbore "mono" with steel shank.  
DIN1835B.





| <b>FMK</b><br>Counterbore |          |                |     |                |                |        |                         |
|---------------------------|----------|----------------|-----|----------------|----------------|--------|-------------------------|
| D<br>mm                   | Part No. | d <sub>1</sub> | L   | L <sub>1</sub> | L <sub>2</sub> | Weldon | No. of inserts/<br>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                    |



| <b>FMU</b><br>Counterbore |          |                |     |                |                |        |                         |
|---------------------------|----------|----------------|-----|----------------|----------------|--------|-------------------------|
| D<br>mm                   | Part No. | d <sub>1</sub> | L   | L <sub>1</sub> | L <sub>2</sub> | Weldon | No. of inserts/<br>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                    |



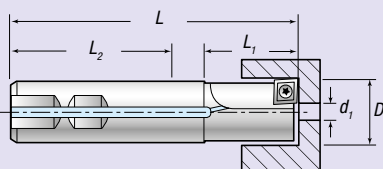
| <b>PK 15°, 30°, 45°, 60°, 75°</b><br>Chamfer and face milling tool |          |                |     |                |                |        |                         |
|--------------------------------------------------------------------|----------|----------------|-----|----------------|----------------|--------|-------------------------|
| D<br>mm                                                            | Part No. | d <sub>1</sub> | L   | L <sub>1</sub> | L <sub>2</sub> | Weldon | No. of inserts/<br>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                    |



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

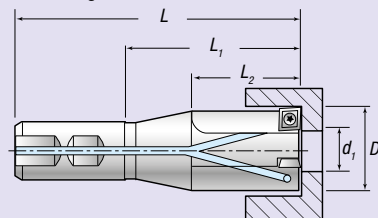
## FMK

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



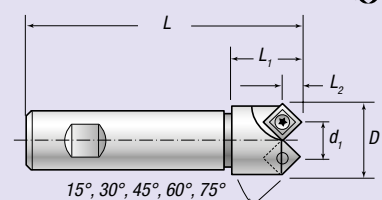
## FMU

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



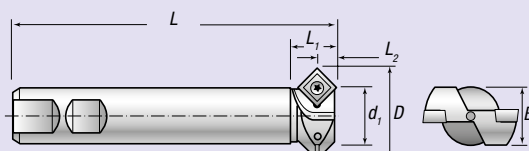
## PK

Chamfer and face milling tool.



## FF

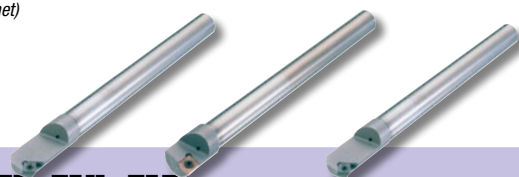
2-flute chamfer tool 2x45°. DIN1835B.





| Part No.   | Working piece                 |              |        |        | Free cutting steel  | Tool steels alloyed  | High alloyed steel   | Stainless steels    | High temp resistant steel and alloys | Titanium 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 200-400 <1200N/mm                 | HB 215-500 <1000N/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    |                     |                      |                      |                     | ○ 15-70                              | ○ 40-70              | ● 180-300           | ● 300-600  |
| MPHT-N14-D | 06                            | N14          | DX6    | 0,2    | ● 90-140            |                      |                      | ● 70-120            | ○ 15-20                              | ○ 40-60              |                     |            |
| 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    |                     |                      |                      |                     | ○ 15-70                              | ○ 40-70              | ● 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           | ○ 15-70                              | ○ 40-70              |                     | ● 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    |                     |                      |                      |                     | ○ 15-70                              | ○ 40-70              | ● 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    |                     |                      |                      |                     | ○ 15-70                              | ○ 40-70              | ● 180-300           |            |
| MBHT-N12-P | 12                            | N12          | PMK92* | 0,4    | ● 160-300           | ● 140-220            | ● 90-150             | ● 90-180            | ○ 20-60                              |                      | ● 160-200           | ● 300-1000 |
| MBHT-N13-C | 12                            | N13          | CH1    | 0,4    |                     |                      |                      |                     |                                      | ○ 40-60              | ● 160-200           | ● 300-1000 |
| MBHT-N13-K | 12                            | N13          | KM22*  | 0,4    |                     |                      |                      | ● 150-300           | ○ 15-70                              | ○ 40-70              |                     | ● 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)



| Part No.   | FA - FAH - FAE ● = Excellent ○ = Good m/min fz=0,03-0,1 |              |        |        |                     |                      |                      |                      |                                      |                      |                     |            |     |
|------------|---------------------------------------------------------|--------------|--------|--------|---------------------|----------------------|----------------------|----------------------|--------------------------------------|----------------------|---------------------|------------|-----|
|            | Working piece                                           |              |        |        | Free cutting steel  | Tool steels alloyed  | High alloyed steel   | Stainless steels     | High temp resistant steel and alloys | Titanium 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 215-500 <1000N/mm | HB 175-245 <700N/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    |                     |                      |                      |                      | ○ 15-60                              | ○ 40-60              | ● 160-200           | ● 150-190  |     |
| MPHT-N13-K | 06                                                      | N13          | KM22*  | 0,2    |                     |                      |                      |                      | ○ 15-70                              | ○ 40-70              | ● 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)



| Part No.   | <div><div></div><div><b>FF</b></div><div>● = Excellent   ○ = Good   m/min</div><div><b>fz=0,05-0,3</b></div></div> |              |          |        |                     |                      |                      |                      |                                      |                      |                     |           |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|--------|---------------------|----------------------|----------------------|----------------------|--------------------------------------|----------------------|---------------------|-----------|
|            | Working piece                                                                                                                                                                                         |              |          |        | Free cutting steel  | Tool steels alloyed  | High alloyed steel   | Stainless steels     | High temp resistant steel and alloys | Titanium 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 215-500 <1000N/mm | HB 175-245 <700N/mm                  | HB 200-400 <1200N/mm | HB 175-225 <800N/mm | HB <160   |
| SDHT-N17-C | 09                                                                                                                                                                                                    | N17          | CH1      |        |                     |                      |                      | ○ 15-60              | ○ 40-60                              | ● 160-200            | ● 300-1000          |           |
| SDLT-N19-P | 09                                                                                                                                                                                                    | N19          | PMK63*** |        | ● 150-250           | ● 200-250            | ● 90-180             | ○ 90-150             | ○ 40-60                              | ● 100-200            |                     |           |
|            | 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.

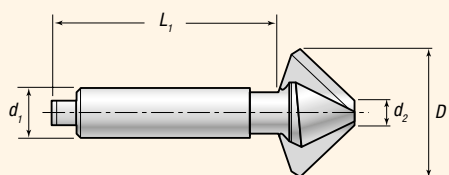
# Countersinks Type 100, with cylindrical shanks

**GRANLUND**  
Tools



| Ø<br>mm | 100T          |               |               |                | 100TT         |               |               | 100TA          |               |               |
|---------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|
|         | HSS           |               |               |                | HSS TiN       |               |               | HSS ALDURA PRO |               |               |
|         | Tol.x9<br>60° | Tol.x9<br>80° | Tol.x9<br>90° | Tol.x9<br>120° | Tol.x9<br>60° | Tol.x9<br>80° | Tol.x9<br>90° | Tol.x9<br>60°  | Tol.x9<br>80° | Tol.x9<br>90° |
|         | 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    |                |               |               | 100TT9-06,0   |                |               | 100TA9-06,0   |
| 6,3     |               |               | 100T9-06,3    |                |               |               | 100TT9-06,3   |                |               | 100TA9-06,3   |
| 6,5     |               | 100T8-06,5    | 100T9-06,5    |                |               |               |               |                |               |               |
| 7,0     |               |               | 100T9-07,0    |                |               |               |               |                |               |               |
| 7,3     |               |               | 100T9-07,3    |                |               |               |               |                |               |               |
| 8,0     | 100T6-08,0    | 100T8-08,0    | 100T9-08,0    |                |               |               | 100TT9-08,0   |                |               | 100TA9-08,0   |
| 8,3     |               |               | 100T9-08,3    |                |               |               | 100TT9-08,3   |                |               | 100TA9-08,3   |
| 8,6     |               |               | 100T9-08,6    |                |               |               |               |                |               |               |
| 9,4     |               |               | 100T9-09,4    |                |               |               |               |                |               |               |
| 10,0    | 100T6-10,0    | 100T8-10,0    | 100T9-10,0    |                | 100TT6-10,0   | 100TT8-10,0   | 100TT9-10,0   | 100TA6-10,0    | 100TA8-10,0   | 100TA9-10,0   |
| 10,4    |               | 100T8-10,4    | 100T9-10,4    | 100T12-10,4    |               |               | 100TT9-10,4   |                |               | 100TA9-10,4   |
| 11,5    |               |               | 100T9-11,5    |                |               |               |               |                |               |               |
| 12,0    | 100T6-12,0    | 100T8-12,0    | 100T9-12,0    |                | 100TT6-12,0   |               | 100TT9-12,0   | 100TA6-12,0    |               | 100TA9-12,0   |
| 12,4    |               | 100T8-12,4    | 100T9-12,4    | 100T12-12,4    |               |               | 100TT9-12,4   |                |               | 100TA9-12,4   |
| 13,4    |               |               | 100T9-13,4    |                |               |               |               |                |               |               |
| 15,0    |               |               | 100T9-15,0    |                |               |               | 100TT9-15,0   |                |               | 100TA9-15,0   |
| 16,0    | 100T6-16,0    | 100T8-16,0    | 100T9-16,0    |                | 100TT6-16,0   |               | 100TT9-16,0   | 100TA6-16,0    |               | 100TA9-16,0   |
| 16,4    |               |               | 100T9-16,4    |                |               |               |               |                |               |               |
| 16,5    |               |               | 100T9-16,5    | 100T12-16,5    |               |               | 100TT9-16,5   |                |               | 100TA9-16,5   |
| 18,0    |               |               | 100T9-18,0    |                |               |               |               |                |               |               |
| 19,0    |               |               | 100T9-19,0    |                |               |               |               |                |               |               |
| 20,0    | 100T6-20,0    | 100T8-20,0    | 100T9-20,0    |                | 100TT6-20,0   | 100TT8-20,0   | 100TT9-20,0   | 100TA6-20,0    | 100TA8-20,0   | 100TA9-20,0   |
| 20,5    |               |               | 100T9-20,5    | 100T12-20,5    |               |               | 100TT9-20,5   |                |               | 100TA9-20,5   |
| 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   | 100TA6-25,0    | 100TA8-25,0   | 100TA9-25,0   |
| 26,0    |               |               | 100T9-26,0    |                |               |               |               |                |               |               |
| 28,0    |               |               | 100T9-28,0    |                |               |               |               |                |               |               |
| 30,0    | 100T6-30,0    | 100T8-30,0    | 100T9-30,0    |                | 100TT6-30,0   | 100TT8-30,0   | 100TT9-30,0   | 100TA6-30,0    | 100TA8-30,0   | 100TA9-30,0   |
| 31,0    |               |               | 100T9-31,0    | 100T12-31,0    |               |               |               |                |               |               |
| 34,0    |               |               | 100T9-34,0    |                |               |               |               |                |               |               |
| 35,0    |               |               | 100T9-35,0    |                |               |               | 100TT9-35,0   |                |               | 100TA9-35,0   |
| 37,0    |               |               | 100T9-37,0    |                |               |               |               |                |               |               |
| 40,0    | 100T6-40,0    | 100T8-40,0    | 100T9-40,0    |                |               |               | 100TT9-40,0   |                |               | 100TA9-40,0   |

**Dimension table**



| Type 100<br>60°, 80°, 90°    | D<br>x9     | d <sub>1</sub> | d <sub>2</sub> | L <sub>1</sub> |
|------------------------------|-------------|----------------|----------------|----------------|
| T, TT, TA<br>TR, TRHL<br>THS | 4,3 - 8,3   | 6,0            | 1,5            | 40             |
|                              | 8,6 - 13,4  | 6,0            | 2,0            | 40             |
|                              | 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        | 10,0*          | 2,0            | 104            |
|                              | 16,0        | 10,0*          | 3,0            | 106            |
|                              | 20,0 - 30,0 | 10,0*          | 4,0            | 106            |
| 100TH                        | 12,0 - 15,0 | 6,0            | 4,0            | 40             |
|                              | 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                       | 10,4 - 12,4 | 6,0            | 2,0            | 48             |
|                              | 16,5 - 25,0 | 10,0           | 2,0            | 48             |
|                              | 31,0        | 12,0           | 2,5            | 50             |

\* Cylindrical shank with 3 facets.

| Dim         | P           | M           | K           | N           | mm/rev |
|-------------|-------------|-------------|-------------|-------------|--------|
| Vc          | 15 - 27     | 8 - 20      | 20 - 50     | 25 - 75     |        |
| 4,3 - 9,4   | 0,05 - 0,08 | 0,05 - 0,08 |             | 0,05 - 0,09 |        |
| 10,0 - 15,0 | 0,06 - 0,14 | 0,06 - 0,14 |             | 0,06 - 0,14 |        |
| 16 - 23     | 0,10 - 0,25 | 0,10 - 0,20 | 0,05 - 0,30 | 0,15 - 0,28 |        |
| 25 - 40     | 0,20 - 0,30 | 0,15 - 0,30 | 0,05 - 0,30 | 0,15 - 0,30 |        |

# Countersinks Type 100, with cylindrical shanks

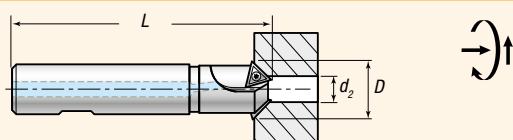
**GRANLUND**  
Tool

|         | <b>100TR</b><br>for Stainless steel | <b>100TRHL</b><br>for Stainless steel | <b>100TH</b>  |               | <b>100TL</b><br>Extra long | <b>100E</b><br>Single flute | <b>100TG</b><br>Hand deburring tool |
|---------|-------------------------------------|---------------------------------------|---------------|---------------|----------------------------|-----------------------------|-------------------------------------|
|         | HSS                                 | HSS HARDLUBE                          | Carbide K10   | Carbide K10   | HSS                        | HSS                         | HSS                                 |
|         | Tol.x9<br>90°                       | Tol.x9<br>90°                         | Tol.x9<br>60° | Tol.x9<br>90° | Tol.x9<br>90°              | Tol.x9<br>90°               | Tol.x9<br>90°                       |
| Ø<br>mm | Part No.                            | Part No.                              | Part No.      | Part No.      | Part No.                   | Part No.                    | Part No.                            |
| 6,3     |                                     |                                       |               |               |                            |                             |                                     |
| 8,0     | 100TR9-08,0                         | 100TRHL9-08,0                         |               |               |                            | 100E9-08,0                  |                                     |
| 8,3     | 100TR9-08,3                         | 100TRHL9-08,3                         |               |               |                            |                             |                                     |
| 10,0    | 100TR9-10,0                         | 100TRHL9-10,0                         |               |               |                            | 100E9-10,0                  |                                     |
| 10,4    | 100TR9-10,4                         | 100TRHL9-10,4                         |               |               |                            |                             |                                     |
| 12,0    | 100TR9-12,0                         | 100TRHL9-12,0                         |               | 100TH9-12,0   | 100TL9-12,0                | 100E9-12,0                  | 100TG9-12,0                         |
| 12,4    | 100TR9-12,4                         | 100TRHL9-12,4                         |               |               |                            |                             |                                     |
| 15,0    | 100TR9-15,0                         | 100TRHL9-15,0                         |               |               |                            |                             |                                     |
| 16,0    | 100TR9-16,0                         | 100TRHL9-16,0                         | 100TH6-16,0   | 100TH9-16,0   | 100TL9-16,0                | 100E9-16,0                  |                                     |
| 16,5    | 100TR9-16,5                         | 100TRHL9-16,5                         |               |               |                            |                             |                                     |
| 20,0    | 100TR9-20,0                         | 100TRHL9-20,0                         | 100TH6-20,0   | 100TH9-20,0   | 100TL9-20,0                | 100E9-20,0                  | 100TG9-20,0                         |
| 20,5    | 100TR9-20,5                         | 100TRHL9-20,5                         |               |               |                            |                             |                                     |
| 25,0    | 100TR9-25,0                         | 100TRHL9-25,0                         | 100TH6-25,0   | 100TH9-25,0   | 100TL9-25,0                | 100E9-25,0                  |                                     |
| 30,0    | 100TR9-30,0                         | 100TRHL9-30,0                         | 100TH6-30,0   | 100TH9-30,0   | 100TL9-30,0                | 100E9-30,0                  | 100TG9-30,0                         |
| 35,0    | 100TR9-35,0                         | 100TRHL9-35,0                         |               |               |                            |                             |                                     |
| 40,0    | 100TR9-40,0                         | 100TRHL9-40,0                         |               | 100TH9-40,0   |                            |                             | 100TG9-40,0                         |



**FV 90°, Chamfer and face milling tool**

| D<br>mm | Part No. | Weldon<br>Shank mm | d <sub>min</sub><br>mm | L<br>mm | Chamfers<br>maximum<br>depth<br>mm | No. of<br>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                  |      |           |          |        |              |     |
|---------------------------------|------|-----------|----------|--------|--------------|-----|
| Type of tool D mm               | Size | Part No.  | Part No. | Radius | Suitable for | SSK |
| FV9 12,0-16,5<br>Transformaster | 07   | TPMT-07U  | TPMR-07U | 0,4    | Universal    | 20  |
|                                 | 07   |           | TPMR-07U | 0,4    | HARDOX       |     |
|                                 | 07   | TPMT-07SA |          | 0,4    | Stainless    |     |
|                                 | 07   | TPMT-07SA |          | 0,4    | Aluminium    |     |
| FV 20,0 - 30,0                  | 10   | TPMT-10U  |          | 0,4    | Universal    | 22  |
|                                 | 10   | TPMT-10U  |          | 0,4    | HARDOX       |     |
|                                 | 10   | TPMT-10SA |          | 0,4    | Stainless    |     |
|                                 | 10   | TPMT-10SA |          | 0,4    | Aluminium    |     |

• The GRANLUND inserts have special chipbreaker angle for optimum chip control.

## Cutting data for Chamfering Type FV

| Material                      | Speed         | Feed              | Material       | Speed          | Feed            |
|-------------------------------|---------------|-------------------|----------------|----------------|-----------------|
| Steel <450 N/mm <sup>2</sup>  | 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 <sup>2</sup>  | 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 <sup>2</sup> | 55 -100 m/min | 0,1 - 0,3 mm/rev. |                |                |                 |

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

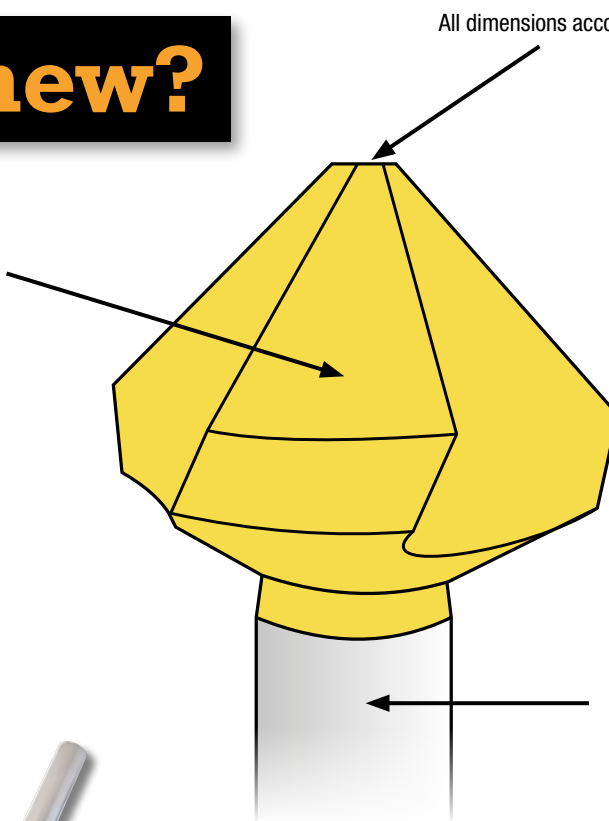
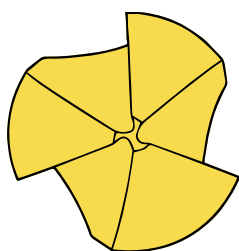


| 100TSK/100TRSK* |                      | 100TB                                             |      |      |      |      |      |      | 100TTSK** |  |
|-----------------|----------------------|---------------------------------------------------|------|------|------|------|------|------|-----------|--|
| 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.

## What's new?

New design with extreme differential pitch, eliminates vibrations and reduces axial and radial forces. Makes an improved result by countersinking.

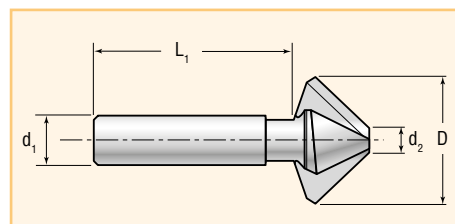


All dimensions according to DIN 335C

As always on Granlund-countersinks...  
Three grinded flats on the shank to improve the grip in drill chucks. Available on shank diameters 8, 10 and 12 mm.

| D Ø<br>mm | 405T9<br>Differential Pitch | 405TT9<br>Differential Pitch |    |                |                |
|-----------|-----------------------------|------------------------------|----|----------------|----------------|
|           | HSS-E                       | HSS-E TiN                    | L  | d <sub>1</sub> | d <sub>2</sub> |
|           | Uncoated<br>90°             | TiN-Coated<br>90°            | mm | mm             | mm             |
|           | Part No.                    | Part No.                     |    |                |                |
| 4,3       | 405T9-04,3                  | 405TT9-04,3                  | 40 | 4              | 1,5            |
| 5,3       | 405T9-05,3                  | 405TT9-05,3                  | 40 | 4              | 1,5            |
| 6,0       | 405T9-06,0                  | 405TT9-06,0                  | 45 | 5              | 1,5            |
| 6,3       | 405T9-06,3                  | 405TT9-06,3                  | 45 | 5              | 1,5            |
| 8,0       | 405T9-08,0                  | 405TT9-08,0                  | 50 | 6              | 2,0            |
| 8,3       | 405T9-08,3                  | 405TT9-08,3                  | 50 | 6              | 2,0            |
| 9,4       | 405T9-09,4                  | 405TT9-09,4                  | 50 | 6              | 2,2            |
| 10,0      | 405T9-10,0                  | 405TT9-10,0                  | 50 | 6              | 2,5            |
| 10,4      | 405T9-10,4                  | 405TT9-10,4                  | 50 | 6              | 2,5            |
| 11,5      | 405T9-11,5                  | 405TT9-11,5                  | 56 | 8*             | 2,8            |
| 12,0      | 405T9-12,0                  | 405TT9-12,0                  | 56 | 8*             | 2,8            |
| 12,4      | 405T9-12,4                  | 405TT9-12,4                  | 56 | 8*             | 2,8            |
| 15,0      | 405T9-15,0                  | 405TT9-15,0                  | 60 | 10*            | 3,2            |
| 16,5      | 405T9-16,5                  | 405TT9-16,5                  | 60 | 10*            | 3,2            |
| 20,5      | 405T9-20,5                  | 405TT9-20,5                  | 63 | 10*            | 3,5            |
| 25,0      | 405T9-25,0                  | 405TT9-25,0                  | 67 | 10*            | 3,8            |
| 28,0      | 405T9-28,0                  | 405TT9-28,0                  | 71 | 12*            | 4,0            |
| 30,0      | 405T9-30,0                  | 405TT9-30,0                  | 71 | 12*            | 4,2            |
| 31,0      | 405T9-31,0                  | 405TT9-31,0                  | 71 | 12*            | 4,2            |

\* Cylindrical shank with 3 grinded flats.



|          | Material             | Suitable for |
|----------|----------------------|--------------|
| <b>P</b> | Steel <500           | ●            |
|          | Steel <850           | ●            |
|          | Steel <1200          | ○            |
| <b>M</b> | Stainless steel <600 | ●            |
|          | Stainless steel <850 | ○            |
| <b>K</b> | Cast iron            | ●            |
| <b>N</b> | Aluminum <10% Si     | ●            |

| Sets     |                     |                      |      |      |      |      |
|----------|---------------------|----------------------|------|------|------|------|
| Part No. | Type of Countersink | Including dimensions |      |      |      |      |
| 405T9    | 405T                | 6,3                  | 10,4 | 16,5 | 20,5 | 25,0 |
| 405TT9   | 405TT (TiN)         | 6,3                  | 10,4 | 16,5 | 20,5 | 25,0 |



405TT9 set

# Backspotfacing/chamfering tools

**GRANLUND**  
Tools



**BV  
Backspotfacer**

| Shank Weldon |                        |              |              |                   |                   |       |
|--------------|------------------------|--------------|--------------|-------------------|-------------------|-------|
| D mm         | d <sub>1</sub> min. mm | Part No.     | Shank Weldon | L <sub>1</sub> mm | L <sub>2</sub> 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  |
| 43,0         | 30,0                   | BV-43,0/30,0 | 32           | 90                | 16                | 7,00  |
| 46,0         | 30,0                   | BV-46,0/30,0 | 32           | 90                | 16                | 8,50  |
| 48,0         | 31,0                   | BV-48,0/31,0 | 32           | 90                | 16                | 8,90  |
| 50,0         | 33,0                   | BV-50,0/33,0 | 32           | 105               | 16                | 9,00  |

\* = Position place.



**BFV 90°  
Backspotfacer**

| Shank Weldon |                        |               |              |                   |                   |       |
|--------------|------------------------|---------------|--------------|-------------------|-------------------|-------|
| D mm         | d <sub>1</sub> min. mm | Part No.      | Shank Weldon | L <sub>1</sub> mm | L <sub>2</sub> 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 <sub>1</sub> min. mm | Part No.      | Shank Weldon | L <sub>1</sub> mm | L <sub>2</sub> 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

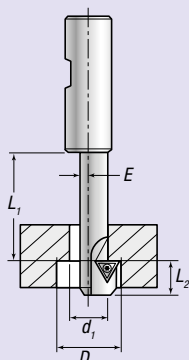
| Type of insert                                       |      |           |          |        |              |     |
|------------------------------------------------------|------|-----------|----------|--------|--------------|-----|
| Type of tools D mm                                   | Size | Part No.  | Part No. | Radius | Suitable for | SSK |
| BV 18,0 - 27,0<br>DFV 15,0 - 31,0<br>BFV 15,0 - 31,0 | 07   | TPMT-07U  | TPMR-07U | 0,4    | Universal    | 20  |
|                                                      | 07   |           | TPMR-07U | 0,4    | HARDOX       |     |
|                                                      | 07   | TPMT-07SA |          | 0,4    | Stainless    |     |
|                                                      | 07   | TPMT-07SA |          | 0,4    | Aluminium    |     |
| BV >27,0 - 48,0                                      | 10   | TPMT-10U  |          | 0,4    | Universal    | 22  |
|                                                      | 10   | TPMT-10U  |          | 0,4    | HARDOX       |     |
|                                                      | 10   | TPMT-10M  |          | 0,4    | Stainless    |     |
|                                                      | 10   | TPMT-10K  |          | 0,4    | Aluminium    |     |

- The GRANLUND inserts have special chipbreaker angle for optimum chip control.

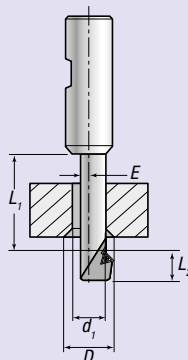
## Cutting data for type BV, BFV and DFV

| Material                      | Speed          | Feed                | Material       | Speed          | Feed                |
|-------------------------------|----------------|---------------------|----------------|----------------|---------------------|
| Steel <450 N/mm <sup>2</sup>  | 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 <sup>2</sup>  | 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 <sup>2</sup> | 50 - 100 m/min | 0,05 - 0,15 mm/rev. |                |                |                     |

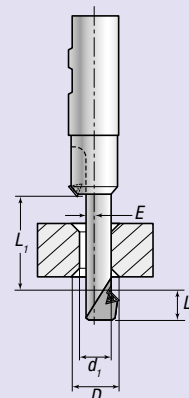
**BV, Backspotfacer**



**BFV 90°, Backspotfacer**



**DFV 90°, Front/Backspotfacer**



# NEPTUNE™

powered by water



## The waterdriven backspotfacer developed by Granlund Tools

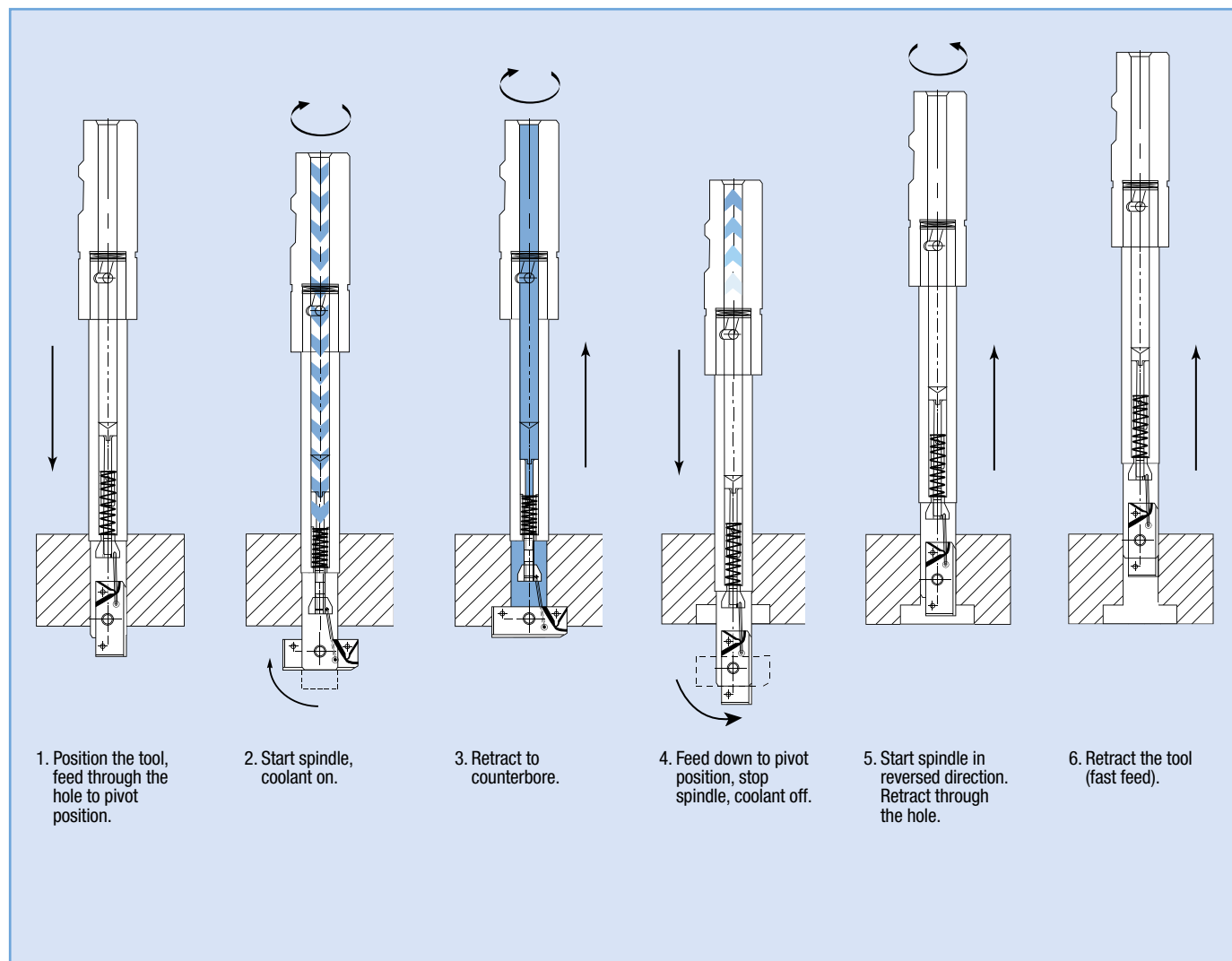
With the Neptune backspotfacer you can produce spotfaces of up to 2 times the diameter of the hole. As a special the tool can be manufactured for an even wider range.

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:

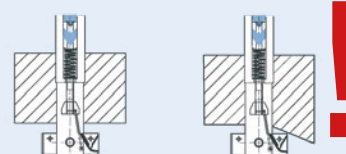
Tool:  
 NE-17,0/33,0  
 Workpiece:  
 SS 1672 t=33 mm  
 Spotface: 3 mm

## Sparepart kit

| Typ     | 1 set contains:                                                                                                                                                                                    |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NESK-13 |  2 x Link<br> 1 x Distributor |
| NESK-15 |                                                                                                                                                                                                    |
| NESK-17 |                                                                                                                                                                                                    |
| NESK-19 |  1 x Spring<br> 1 x Screw    |
| NESK-21 |                                                                                                                                                                                                    |
| NESK-23 |                                                                                                                                                                                                    |
| NESK-25 |  2 x Axle<br> 4 x Nut        |
| NESK-33 |                                                                                                                                                                                                    |

## CAUTION!

Do not operate the tool as single flute. If there is to be any intermittent cutting the feed rate should be reduced by at least 50%.

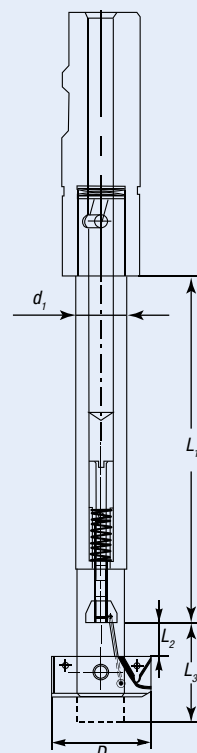


## NEPTUNE

| Part No.     | Inserts  | Screws   | $d_1$ | $D$ | $L_1$ | $L_2$ | $L_3$ | Shank Weldon |
|--------------|----------|----------|-------|-----|-------|-------|-------|--------------|
| NE-13,0/26,0 | TPMT-07U | 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-10U | 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-17U | SSK-40   | 25    | 48  | 125   | 15    | 48    | 32           |
| NE-33,0/61,0 |          | SSK-40   | 33    | 61  | 140   | 30    | 61    | 40           |

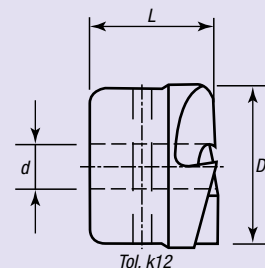
## Important!

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

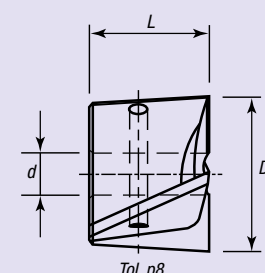




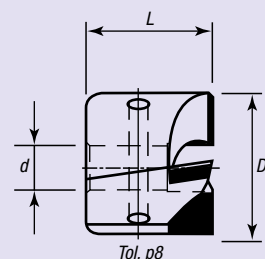
**Type U, UD, UH and UDH**



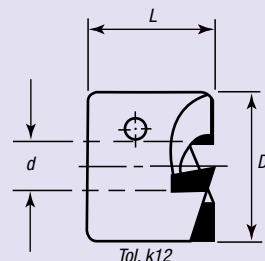
**Type U**



**Type UD**



**Type UDH**



**Type UH**

| Size<br>d<br>mm |          |      | U               | UD             | UH                      | UDH                    |
|-----------------|----------|------|-----------------|----------------|-------------------------|------------------------|
|                 | D mm     | L mm | HSS<br>Tol. k12 | HSS<br>Tol. p8 | Carbide K40<br>Tol. k12 | Carbide K40<br>Tol. p8 |
|                 | Part No. |      | 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         |                |                         |                        |
| 9               | 26,0     | 17   | U-06/26         |                |                         |                        |
|                 | 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              |
| 14              | 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              |
|                 | 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              |
| 20              | 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              |
|                 | 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              |
| 30              | 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              |
|                 | 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.

# Backspotfacing system

**GRANLUND**  
Tools

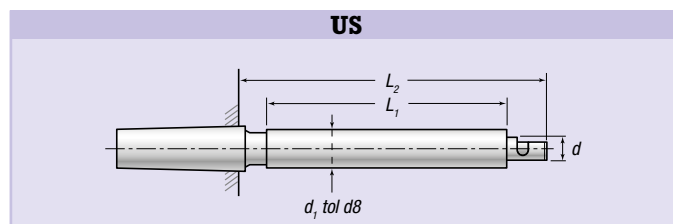


| US MT     |                   |                   |                   |       |                |
|-----------|-------------------|-------------------|-------------------|-------|----------------|
| Size d mm | d <sub>1</sub> mm | L <sub>1</sub> mm | L <sub>2</sub> mm | Shank | Type US        |
| Part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

| US Weldon |                   |                   |                   |           |                |
|-----------|-------------------|-------------------|-------------------|-----------|----------------|
| Size d mm | d <sub>1</sub> mm | L <sub>1</sub> mm | L <sub>2</sub> mm | Shank     | Type US        |
| Part No.  |                   |                   |                   |           |                |
| 6         | 6,0*              | 55                | 89                | Weldon 12 | US-06/06,0-W12 |
|           | 6,5*              | 55                | 89                | Weldon 12 | US-06/06,5-W12 |
|           | 7,0*              | 55                | 89                | Weldon 12 | US-06/07,0-W12 |
|           | 8,0               | 55                | 89                | Weldon 12 | US-06/08,0-W12 |
|           | 8,5               | 55                | 89                | Weldon 12 | US-06/08,5-W12 |
|           | 9,0               | 55                | 89                | Weldon 12 | US-06/09,0-W12 |
|           | 9,5               | 55                | 89                | Weldon 12 | US-06/09,5-W12 |
|           | 10,0              | 55                | 89                | Weldon 12 | US-06/10,0-W12 |
| 9         | 9,0*              | 75                | 113               | Weldon 16 | US-09/09,0-W16 |
|           | 9,5*              | 75                | 113               | Weldon 16 | US-09/09,5-W16 |
|           | 10,0*             | 75                | 113               | Weldon 16 | US-09/10,0-W16 |
|           | 10,5              | 75                | 113               | Weldon 16 | US-09/10,5-W16 |
|           | 11,0              | 75                | 113               | Weldon 16 | US-09/11,0-W16 |
|           | 11,5              | 75                | 113               | Weldon 16 | US-09/11,5-W16 |
|           | 12,0              | 75                | 113               | Weldon 16 | US-09/12,0-W16 |
|           | 12,5              | 75                | 113               | Weldon 16 | US-09/12,5-W16 |
|           | 13,0              | 75                | 113               | Weldon 16 | US-09/13,0-W16 |
|           | 14,0              | 75                | 113               | Weldon 16 | US-09/14,0-W16 |
|           | 15,0              | 75                | 113               | Weldon 16 | US-09/15,0-W16 |
|           | 14,0*             | 90                | 139               | Weldon 20 | US-14/14,0-W20 |
|           | 14,5*             | 90                | 139               | Weldon 20 | US-14/14,5-W20 |
|           | 15,0*             | 90                | 139               | Weldon 20 | US-14/15,0-W20 |
|           | 16,0              | 90                | 139               | Weldon 20 | US-14/16,0-W20 |
| 14        | 17,0              | 90                | 139               | Weldon 20 | US-14/17,0-W20 |
|           | 18,0              | 90                | 139               | Weldon 20 | US-14/18,0-W20 |
|           | 19,0              | 90                | 139               | Weldon 20 | US-14/19,0-W20 |
|           | 20,0              | 90                | 139               | Weldon 20 | US-14/20,0-W20 |
|           | 21,0              | 90                | 139               | Weldon 20 | US-14/21,0-W20 |
|           | 22,0              | 90                | 139               | Weldon 20 | US-14/22,0-W20 |
|           | 20,0*             | 110               | 163               | Weldon 20 | US-20/20,0-W20 |
|           | 21,0*             | 110               | 163               | Weldon 20 | US-20/21,0-W20 |
|           | 22,0              | 110               | 163               | Weldon 20 | US-20/22,0-W20 |
|           | 23,0              | 110               | 163               | Weldon 20 | US-20/23,0-W20 |
| 20        | 24,0              | 110               | 163               | Weldon 20 | US-20/24,0-W20 |
|           | 25,0              | 110               | 163               | Weldon 20 | US-20/25,0-W20 |
|           | 26,0              | 110               | 163               | Weldon 20 | US-20/26,0-W20 |
|           | 27,0              | 110               | 163               | Weldon 20 | US-20/27,0-W20 |
|           | 28,0              | 110               | 163               | Weldon 20 | US-20/28,0-W20 |
|           | 30,0              | 110               | 163               | Weldon 20 | US-20/30,0-W20 |
|           | 32,0              | 110               | 163               | Weldon 20 | US-20/32,0-W20 |
|           | 30,0*             | 130               | 195               | Weldon 25 | US-30/30,0-W25 |
|           | 32,0              | 130               | 195               | Weldon 25 | US-30/32,0-W25 |
|           | 33,0              | 130               | 195               | Weldon 25 | US-30/33,0-W25 |
| 30        | 34,0              | 130               | 195               | Weldon 25 | US-30/34,0-W25 |
|           | 35,0              | 130               | 195               | Weldon 25 | US-30/35,0-W25 |
|           | 36,0              | 130               | 195               | Weldon 25 | US-30/36,0-W25 |
|           | 38,0              | 130               | 195               | Weldon 25 | US-30/38,0-W25 |
|           | 39,0              | 130               | 195               | Weldon 25 | US-30/39,0-W25 |
|           | 40,0              | 130               | 195               | Weldon 25 | US-30/40,0-W25 |
|           | 42,0              | 130               | 195               | Weldon 25 | US-30/42,0-W25 |
|           | 45,0              | 130               | 195               | Weldon 25 | US-30/45,0-W25 |

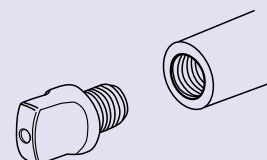
\* Not to be used combined with carbide cutters.

| Strength N/mm <sup>2</sup> |                        | HSS   | HSS      | Carbide | Carbide |
|----------------------------|------------------------|-------|----------|---------|---------|
| Hardness HB                |                        | Vc    | f        | Vc      | f       |
| <b>P</b>                   | <600 N/mm <sup>2</sup> | 15-30 | 0,1-0,5  | 30-70   | 0,1-0,5 |
|                            | >600 N/mm <sup>2</sup> | 5-20  | 0,05-0,3 | 20-50   | 0,1-0,3 |
| <b>M</b>                   | Stainless Steel        | 8-15  | 0,1-0,3  | 30-70   | 0,1-0,3 |
| <b>K</b>                   | <220 HB                | 10-35 | 0,1-0,4  | 50-90   | 0,1-0,4 |
| <b>N</b>                   | Aluminium              | 40-90 | 0,1-0,5  | 50-120  | 0,1-0,5 |



## Removable tang (Spare part)

| For shank | Thread | Part. No.   |
|-----------|--------|-------------|
| MK3       | M12    | GR1801-12-2 |
| MK4       | M16    | GR1801-12-1 |



Backspotfacing

# Indexable insert reamers type RD, RA and RB



| Ø D<br>mm |                 |                      |                      |             | RD<br>For through and blind holes | RA<br>For through holes | RB<br>For blind holes |
|-----------|-----------------|----------------------|----------------------|-------------|-----------------------------------|-------------------------|-----------------------|
|           | Tol. h6<br>d mm | L <sub>1</sub><br>mm | L <sub>2</sub><br>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        | 25              | 120                  | 56                   | 11          |                                   | RA-38,0                 | RB-38,0               |
| 39        | 25              | 120                  | 56                   | 11          |                                   | RA-39,0                 | RB-39,0               |
| 40        | 25              | 120                  | 56                   | 11          |                                   | RA-40,0                 | RB-40,0               |
| 41        | 25              | 120                  | 56                   | 11          |                                   | RA-41,0                 | RB-41,0               |
| 42        | 25              | 120                  | 56                   | 11          |                                   | RA-42,0                 | RB-42,0               |
| 43        | 25              | 120                  | 56                   | 11          |                                   | RA-43,0                 | RB-43,0               |
| 44        | 25              | 120                  | 56                   | 11          |                                   | RA-44,0                 | RB-44,0               |
| 45        | 25              | 120                  | 56                   | 11          |                                   | RA-45,0                 | RB-45,0               |
| 46        | 25              | 120                  | 56                   | 11          |                                   | RA-46,0                 | RB-46,0               |
| 47        | 25              | 120                  | 56                   | 11          |                                   | RA-47,0                 | RB-47,0               |
| 48        | 25              | 120                  | 56                   | 11          |                                   | RA-48,0                 | RB-48,0               |
| 49        | 25              | 120                  | 56                   | 11          |                                   | RA-49,0                 | RB-49,0               |
| 50        | 25              | 120                  | 56                   | 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.

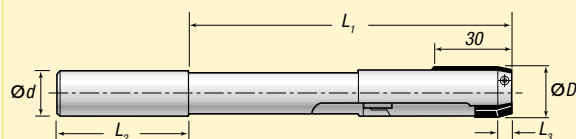


### Cermet DCC, BCC, ACC

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      |  |
|---------------------------|----------|---------------|--|
| DC-04<br>DCT-04<br>DCC-04 | RD       | 09,90 - 15,90 |  |
| BC-08<br>BCT-08<br>BCC-08 | RB       | 15,91 - 21,60 |  |
| BC-11<br>BCT-11<br>BCC-11 | RB       | 21,61 - 120,0 |  |
| AC-08<br>ACT-08<br>ACC-08 | RA       | 15,91 - 21,60 |  |
| AC-11<br>ACT-11<br>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       |           |
| <b>P</b>                             | Steel          | <700N/mm <sup>2</sup>   | 0,1 - 0,4               | 20 - 60  | 12 - 25                   | 25 - 70  | 15 - 30        | 100 - 300 |
|                                      | Steel          | <1000 N/mm <sup>2</sup> | 0,1 - 0,4               | 15 - 40  | 10 - 18                   | 25 - 45  | 15 - 25        | 100 - 200 |
|                                      | Steel          | >1000 N/mm <sup>2</sup> | 0,1 - 0,4               | 20 - 40  | 8 - 15                    | 25 - 45  | 10 - 20        | 100 - 130 |
|                                      | Cast steel     | >800 N/mm <sup>2</sup>  | 0,1 - 0,4               | 20 - 50  | 10 - 20                   | 25 - 60  | 10 - 25        | -         |
| <b>M</b>                             | Stainless      |                         | 0,1 - 0,3               | 15 - 30  | 7 - 15                    | 10 - 30  | 7 - 15         | -         |
|                                      | Inconel        |                         | 0,1 - 0,3               | 10 - 20  | 5 - 15                    | 10 - 20  | 5 - 15         | -         |
| <b>K</b>                             | Cast Iron      | <210 HB                 | 0,15 - 0,4              | 30 - 70  | 15 - 35                   | 20 - 70  | 15 - 35        | 100 - 300 |
|                                      | Cast Iron      | >210 HB                 | 0,15 - 0,4              | 30 - 50  | 15 - 35                   | 20 - 50  | 15 - 35        | 100 - 250 |
|                                      | Malleable iron |                         | 0,1 - 0,3               | 30 - 50  | 12 - 25                   | 15 - 50  | 12 - 25        | -         |
| <b>N</b>                             | Aluminium      | Short chip              | 0,1 - 0,3               | 30 - 70  | 12 - 30                   | -        | -              | -         |
|                                      | Aluminium      | Long chip               | 0,1 - 0,3               | 20 - 70  | 12 - 30                   | -        | -              | -         |
|                                      | Bronze         | Hard                    | 0,1 - 0,3               | 15 - 50  | 6 - 20                    | 15 - 50  | 6 - 20         | -         |
|                                      | Bronze         | Soft                    | 0,1 - 0,3               | 15 - 50  | 10 - 20                   | 15 - 50  | 10 - 20        | -         |
|                                      | Brass          | Short chip              | 0,1 - 0,4               | 25 - 70  | 10 - 50                   | 25 - 70  | 10 - 50        | -         |
|                                      | Brass          | Long chip               | 0,1 - 0,3               | 20 - 45  | 8 - 25                    | 20 - 45  | 10 - 25        | -         |
|                                      | Copper         | Hard                    | 0,1 - 0,4               | 20 - 60  | 10 - 30                   | 20 - 60  | 10 - 30        | -         |
|                                      | Copper         | Soft                    | 0,1 - 0,3               | 20 - 50  | 10 - 20                   | 20 - 60  | 10 - 20        | -         |
|                                      | Plastic        |                         | 0,1 - 0,4               | 30 - 70  | 10 - 30                   | 30 - 70  | 10 - 30        | -         |

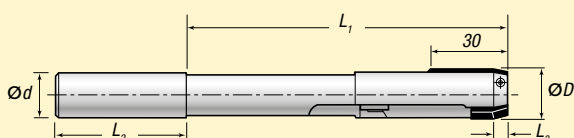
Coolant with minimum 6% concentration recommended.

| Spare parts for reamers type RA, RB, RD |                                                                                     |                                                                                     |                                                                                     |                                                                                      |                                                                                       |                                                      |
|-----------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------|
| Diameter part range mm                  | Eccentric screw                                                                     | Adjusting screw                                                                     | Wedge                                                                               | Pivot                                                                                | Hexagon key                                                                           | Spare set                                            |
|                                         |  |  |  |  |  | 2 pcs ecc screws<br>2 pcs adj screws<br>2 pcs wedges |
| 9,90-12,90                              | ES-3                                                                                | AS-3                                                                                | W-1                                                                                 | F-04                                                                                 | SN-1,5<br>SN-2,0                                                                      | RSB-01                                               |
| 12,91-15,90                             | ES-3                                                                                | AS-3                                                                                | W-2                                                                                 | F-04                                                                                 | SN-1,5<br>SN-2,0                                                                      | RSB-02                                               |
| 15,91-17,90                             | ES-3                                                                                | AS-3                                                                                | W-2                                                                                 | F-08                                                                                 | SN-1,5<br>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 <sub>1</sub> = Reamer working length | L <sub>1</sub> | 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.

## RD, RA and RB



## Reamer with Cermet inserts RD, RA and RB



### Working allowance

Reamer with Cermet inserts Ø 0,20 mm.  
Reamer type RD Ø 0,10-0,30 mm.  
Reamer type RA, RB Ø 0,15-0,40 mm.  
In Stainless and Inconel Ø 0,15 mm.

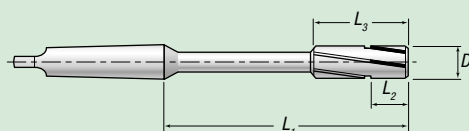
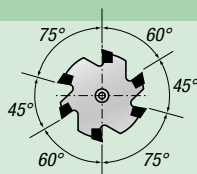
# Carbide reamers, re-sizeable and fixed

**GRANLUND**  
Tools

| H7<br>D<br>mm |  507 |                |                |             |          |  507C |                |                |                |                 |  509 |                |                |             |  509C |     |                |                |  509CC |          |     |                |                |                 |          |
|---------------|---------------------------------------------------------------------------------------|----------------|----------------|-------------|----------|----------------------------------------------------------------------------------------|----------------|----------------|----------------|-----------------|---------------------------------------------------------------------------------------|----------------|----------------|-------------|-----------------------------------------------------------------------------------------|-----|----------------|----------------|-------------------------------------------------------------------------------------------|----------|-----|----------------|----------------|-----------------|----------|
|               | Carbide K10                                                                           |                |                |             |          | Carbide K10                                                                            |                |                |                |                 | Carbide K10                                                                           |                |                |             | Carbide K10                                                                             |     |                |                | Cermet                                                                                    |          |     |                |                |                 |          |
|               | L <sub>1</sub>                                                                        | L <sub>2</sub> | L <sub>3</sub> | Shank<br>MT | Part No. | L                                                                                      | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | Shank<br>cyl. d | Part No.                                                                              | L <sub>1</sub> | L <sub>2</sub> | Shank<br>MT | Part No.                                                                                | L   | L <sub>1</sub> | L <sub>2</sub> | Shank<br>cyl. d                                                                           | Part No. | L   | L <sub>1</sub> | L <sub>2</sub> | Shank<br>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   |                                                                                        |                |                |                |                 |                                                                                       | 157            | 30             | 2           | 509-22                                                                                  | 227 | 157            | 30             | 20                                                                                        | 509C-22  |     |                |                |                 |          |
| 23,0          | 161                                                                                   | 20             | 64             | 2           | 507-23   |                                                                                        |                |                |                |                 |                                                                                       | 161            | 30             | 2           | 509-23                                                                                  | 231 | 161            | 30             | 20                                                                                        | 509C-23  |     |                |                |                 |          |
| 24,0          | 169                                                                                   | 20             | 70             | 3           | 507-24   |                                                                                        |                |                |                |                 |                                                                                       | 169            | 30             | 3           | 509-24                                                                                  | 239 | 169            | 30             | 20                                                                                        | 509C-24  |     |                |                |                 |          |
| 25,0          | 169                                                                                   | 20             | 70             | 3           | 507-25   |                                                                                        |                |                |                |                 |                                                                                       | 169            | 30             | 3           | 509-25                                                                                  | 239 | 169            | 30             | 20                                                                                        | 509C-25  |     |                |                |                 |          |
| 26,0          | 174                                                                                   | 20             | 70             | 3           | 507-26   |                                                                                        |                |                |                |                 |                                                                                       | 174            | 30             | 3           | 509-26                                                                                  | 244 | 174            | 30             | 20                                                                                        | 509C-26  |     |                |                |                 |          |
| 28,0          | 178                                                                                   | 30             | 70             | 3           | 507-28   |                                                                                        |                |                |                |                 |                                                                                       | 178            | 30             | 3           | 509-28                                                                                  | 248 | 178            | 30             | 25                                                                                        | 509C-28  |     |                |                |                 |          |
| 30,0          | 182                                                                                   | 30             | 70             | 3           | 507-30   |                                                                                        |                |                |                |                 |                                                                                       | 182            | 30             | 3           | 509-30                                                                                  | 252 | 182            | 30             | 25                                                                                        | 509C-30  |     |                |                |                 |          |
| 35,0          | 197                                                                                   | 30             | 78             | 4           | 507-35   |                                                                                        |                |                |                |                 |                                                                                       |                |                |             |                                                                                         |     |                |                |                                                                                           |          |     |                |                |                 |          |
| 40,0          | 205                                                                                   | 30             | 78             | 4           | 507-40   |                                                                                        |                |                |                |                 |                                                                                       |                |                |             |                                                                                         |     |                |                |                                                                                           |          |     |                |                |                 |          |

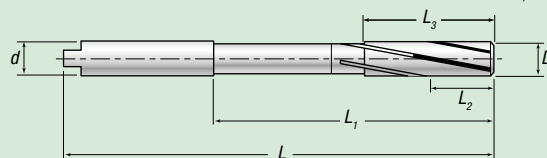
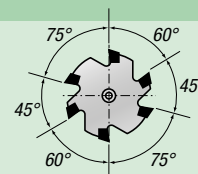
## Typ 507 Reamer

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.



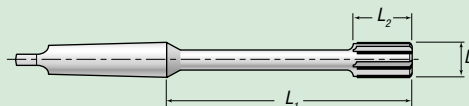
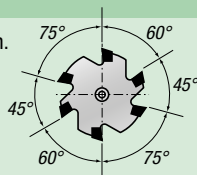
## Type 507C Reamer

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.



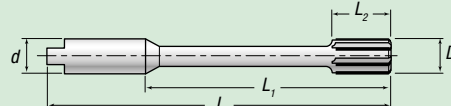
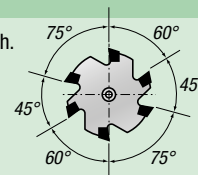
## Type 509 Reamer

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



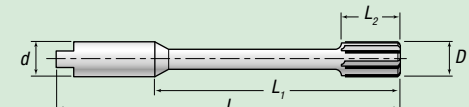
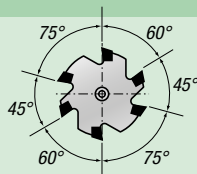
## Type 509C Reamer

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



## Type 509CC Reamer

Solid reamer, straight flutes, extreme differential pitch. 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

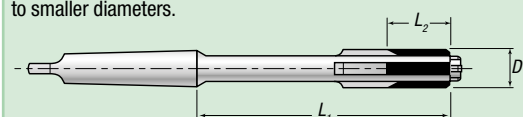
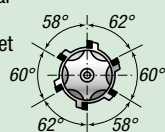
| H7<br>D<br>mm | 510C           |                |                 |          | 511 (Re-sizeable) |                |                 |             |
|---------------|----------------|----------------|-----------------|----------|-------------------|----------------|-----------------|-------------|
|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

| Type | 520   |                  | 522 |    |
|------|-------|------------------|-----|----|
|      | Shank | Internal fitting | d   | D  |
| 520  | MK2   | MK1              | 18  | 51 |
|      | MK2   | MK2              | 23  | 51 |
|      | MK3   | MK2              | 23  | 51 |
|      | MK3   | MK3              | 33  | 57 |
|      | MK4   | MK3              | 33  | 57 |
|      | MK4   | MK4              | 41  | 75 |
| 522* | MK2   | Ø 2,8-13 mm      | 37  | 57 |

\* The holder is delivered with collet 440.

## Type 511 Reamer

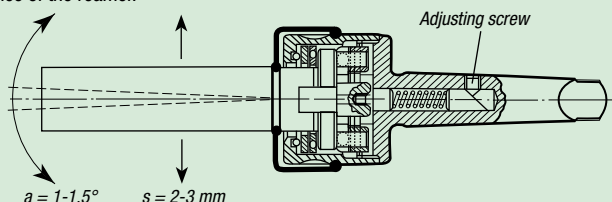
Re-sizeable reamer, straight flutes, differential pitch, for through holes. Grade ISO K10. The expanding reamer can be resized to offset wear by driving the expansion plug further into the reamer. Resizing can normally be done 2-3 times with regrinding. Driving the plug 1 mm further into the reamer will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



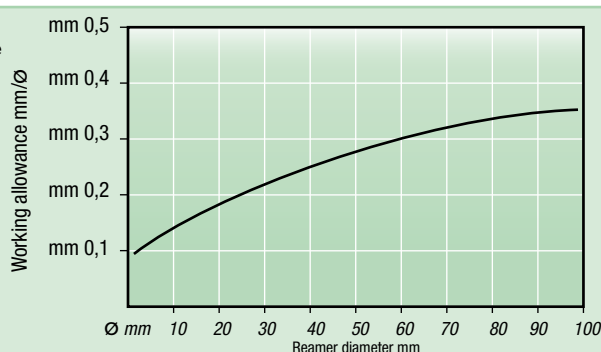
## Floating holders for reamers

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

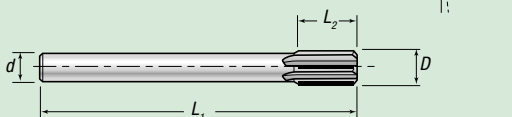
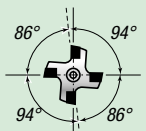


## Cutting data for carbide reamers

| Material          | Tensile strength N/mm <sup>2</sup><br>Hardness HB | Cutting speed<br>m/min. | Feed<br>mm/rev. |
|-------------------|---------------------------------------------------|-------------------------|-----------------|
|                   |                                                   |                         |                 |
| P Steel           | < 600                                             | 10,0 - 15,0             | 0,20 - 0,50     |
| Steel             | < 1000                                            | 5,0 - 12,0              | 0,10 - 0,40     |
| M Stainless steel | > 1000                                            | 5,0 - 10,0              | 0,10 - 0,25     |
| K 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     |
| N Brass           |                                                   | 30,0 - 40,0             | 0,20 - 0,80     |
| Alu. Alloys       |                                                   | 60,0 - 80,0             | 0,40 - 0,80     |
| X Plastic, hard   |                                                   | 20,0                    | 0,20 - 0,40     |

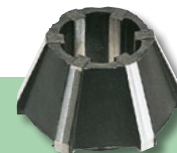
## Type 510C Straight Shank Reamer

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



## Collets

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



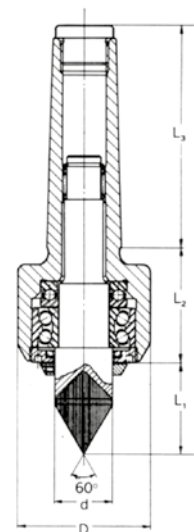
# Rotating and fixed precision centres – carbide tipped

**GRANLUND**  
Tools

## Carbide tipped Rotating centre type 609

Rotating centre type 609 is excellent for applications such as hard turning, where you want a steady operation with a minimum of heat spreading. 609 is a high quality and tough centre that Granlund Tools has a long going experience of manufacturing. We also use our rotating centre in our own production.

- Roundness of 0,002 mm
- Extra long tip allowing more space for machining
- Grinded house and spindle in hardened steel
- High tolerance ball bearings
- Fluid resistant



| Part No. | Shank MK | D mm | d mm | L mm | L1 mm | L2 mm | L3 mm |
|----------|----------|------|------|------|-------|-------|-------|
| 609-MK2  | 2        | 46   | 19   | 145  | 35    | 45    | 65    |
| 609-MK3  | 3        | 60   | 25   | 183  | 45    | 55    | 83    |
| 609-MK4  | 4        | 68   | 27   | 216  | 50    | 60    | 106   |
| 609-MK5  | 5        | 80   | 34   | 260  | 55    | 70    | 135   |

**Load table for type 609**

| Shank MK | Axial preass-ure kg | r/min            |     |     |      |      |      |
|----------|---------------------|------------------|-----|-----|------|------|------|
|          |                     | 40               | 200 | 400 | 1000 | 2000 | 4000 |
|          |                     | Radial load – kg |     |     |      |      |      |
| 2        | 600                 | 240              | 160 | 120 | 90   | 70   | 50   |
| 3        | 950                 | 500              | 340 | 270 | 200  | 160  | 130  |
| 4        | 1300                | 1000             | 600 | 480 | 350  | 280  | 220  |
| 5        | 1700                | 1400             | 800 | 640 | 470  | 380  | 300  |

The loading values has been calculated with a high safety factor and are calculated at a runtime of 2500 hours. At lower runtimes, these values can be exceeded. Please contact your Granlund representative if you need more information.

## Turning and grinding centres type 610A and 611 – carbide tipped



### Typ 610 A

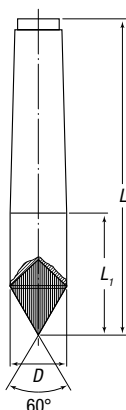
Turning centre with Solid carbide tip.

### Typ 611

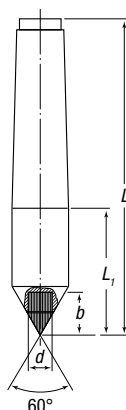
Grinding centre with sliced carbide tip

| Part No. | Part No. | Shank MK | Type 610-611 d mm | Type 610-611 b mm | L mm | L1 mm | Type 611 K mm | Type 611 K mm |
|----------|----------|----------|-------------------|-------------------|------|-------|---------------|---------------|
| 610A-MK2 | 611-MK2  | 2        | 8                 | 16                | 110  | 41    | 3,2           | 18,0          |
| 610A-MK3 | 611-MK3  | 3        | 10                | 20                | 130  | 44,5  | 4             | 24,0          |
| 610A-MK4 | 611-MK4  | 4        | 12                | 22                | 160  | 51,5  | 5             | 31,5          |
| 610A-MK5 | 611-MK5  | 5        | 14                | 25                | 200  | 62    | 6             | *44,4         |

\* Carbide Ø 35 mm



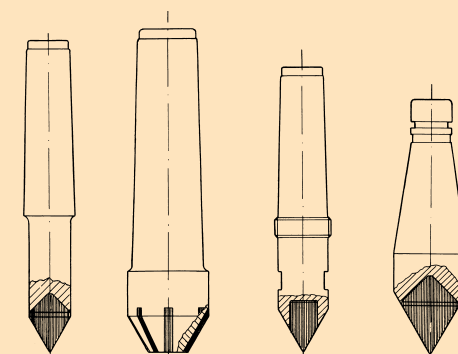
### Typ 610 A

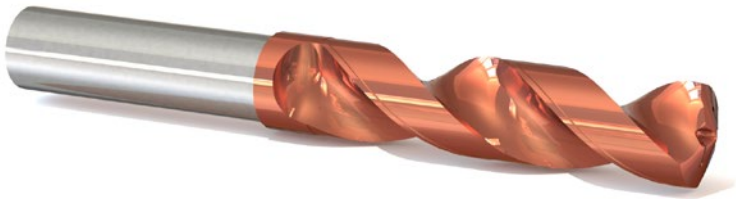


### Typ 611

### Special centres

Granlund Tools manufactures special centres on request. Please contact your Granlund representative for a quotation.





T80 is a solid carbide drill with internal coolant supply and a drill bit specially developed for drilling in HARDOX™. T80 also has a special coating for optimum performance. T80 stands for maximum recommended speed in HARDOX™ 500 (80 m/min).

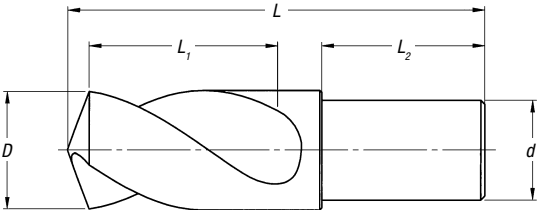
With T80 and the HD drill Granlund Tools is able to offer a complete tool palette for drilling, counterboring and counter-sinking in HARDOX™. This is possible together with the existing "H"-insert for our indexable counterbores and countersinks WHV and KV.



**KV**  
90°



**WHV**  
Counterbore



| Part No.  | D    | d    | L <sub>1</sub><br>(cutting length) | L <sub>2</sub> | L     |
|-----------|------|------|------------------------------------|----------------|-------|
| T80-10,0  | 10,0 | 10,0 | 36,0                               | 41,0           | 82,0  |
| T80-12,0  | 12,0 | 12,0 | 36,0                               | 41,0           | 82,0  |
| T80-13,5  | 13,5 | 12,0 | 36,0                               | 41,0           | 82,0  |
| T80-14,0  | 14,0 | 14,0 | 36,0                               | 41,0           | 82,0  |
| T80-15,5  | 15,5 | 14,0 | 36,0                               | 41,0           | 82,0  |
| T80-17,5  | 17,5 | 16,0 | 55,0                               | 41,0           | 103,0 |
| T80-18,0  | 18,0 | 16,0 | 60,0                               | 41,0           | 110,0 |
| T80-20,0  | 20,0 | 20,0 | 57,0                               | 41,0           | 110,0 |
| T80-22,0  | 22,0 | 20,0 | 55,0                               | 41,0           | 110,0 |
| T80-24,0  | 24,0 | 20,0 | 55,0                               | 41,0           | 110,0 |
| T80-26,0  | 26,0 | 25,0 | 55,0                               | 41,0           | 110,0 |
| T80-28,0* | 28,0 | 25,0 | 55,0                               | 41,0           | 110,0 |
| T80-30,0* | 30,0 | 25,0 | 55,0                               | 41,0           | 110,0 |

\* Not standard stock

| Recommended cutting data |             |             |             |
|--------------------------|-------------|-------------|-------------|
| Material:                | Hardox 400  | Hardox 500  | Hardox 600  |
| Speed m/min:             | 30 - 80     | 30 - 80     | 25 - 70     |
| Feed mm/rev:             | 0,10 - 0,25 | 0,05 - 0,15 | 0,04 - 0,12 |

# Spirabor System

Interchangeable within the same system size

**GRANLUND**  
Tools

Granlunds spirabor is a flexible and cost effective tool system for drilling large holes in different types of metal. E.g. 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.

Cutter head sizes  $\varnothing$  32–100 mm are standard  
Specials up to  $\varnothing$  200 mm can be offered.

The diameter range  $\varnothing$  32–100 is divided into seven groups 11–17. As described in the table (right) several diameter cutter heads can be used within the same group in each group.



## Cutting data

### Speed

|          | Material        | Tensile strength<br>N/mm <sup>2</sup> | Speed<br>m/min |
|----------|-----------------|---------------------------------------|----------------|
| <b>P</b> | Steel           | < 500                                 | 15 - 20        |
|          | Steel           | 500-900                               | 10 - 15        |
| <b>K</b> | Cast steel      | < 800                                 | 5 - 12         |
|          | Cast iron       | < 220 HB                              | 10 - 15        |
| <b>M</b> | Stainless steel |                                       | 5 - 15         |

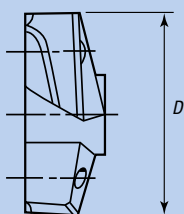
### Feed

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

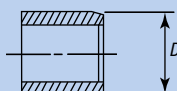
|           | Cutter head<br>Type B |          | Pilot Bush<br>Type R |           | Retaining<br>Pin<br>Type RT | Holder<br>Type A |    |             |
|-----------|-----------------------|----------|----------------------|-----------|-----------------------------|------------------|----|-------------|
| Size      | D mm<br>tol. h10      | Part No. | D mm<br>Tol. c9      | Part No.  | Part No.                    | L mm             | MK | Part No.    |
| <b>11</b> | 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 |
| <b>12</b> | 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 |
| <b>13</b> | 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   |                      |           |                             |                  |    |             |
| <b>14</b> | 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   |                      |           |                             |                  |    |             |
| <b>15</b> | 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   |                      |           |                             |                  |    |             |
|           | 65                    | 15B-65   |                      |           |                             |                  |    |             |
| <b>16</b> | 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   |                      |           |                             |                  |    |             |
|           | 78                    | 16B-78   |                      |           |                             |                  |    |             |
| <b>17</b> | 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.

## Cutter head



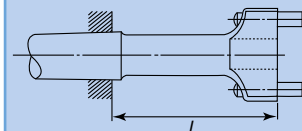
## Pilot Bush



## Retaining Pin



## Holder





Granlund Tools balancing stands for balancing of grinding wheels. Our balancing stands are also excellent for balancing axles, propellers, etc.

The balancing stands are manufactured for highest precision and accuracy when balancing. A good balanced grinding wheel results in less wear on the machine, a better grinding result and of course longer life of your grinding wheel.

- Harded and ground balancing discs are run on ball bearings.
- Suitable for static balancing of grinding wheels, axles and other rotating machine elements.

| Part No. | 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 may be balanced with longer guiding bars.

## Instruction for balancing of grinding wheels

### General

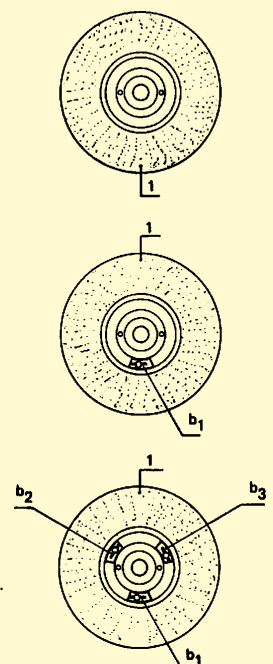
Grinding wheels that are used for fine grinding, should be well balanced. If the wheel is unbalanced, vibrations will occur and cause a poor surface finish. The bearings in the grinding machine will also be affected and in worst case damaged.

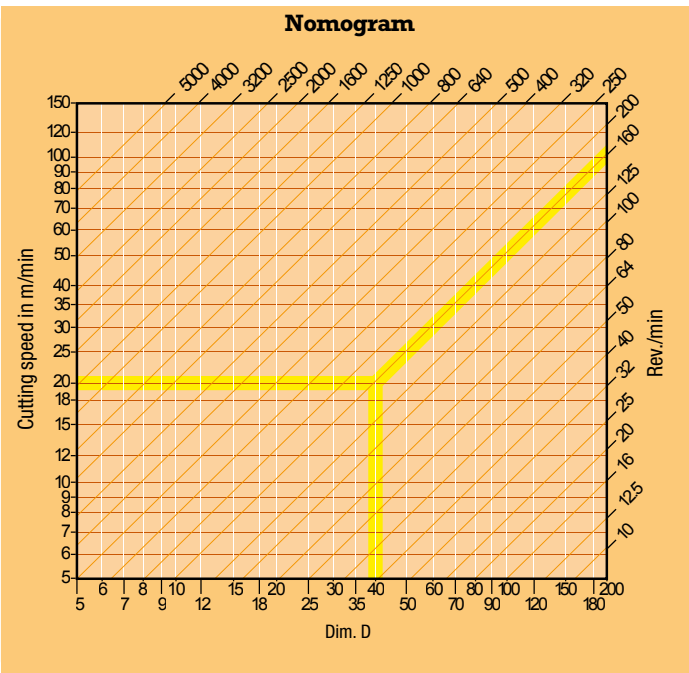
### Control of the grinding wheel

Check if wheel is broken by knocking on a freely hanging wheel. If the tone is clean, the wheel is intact.

### Balancing

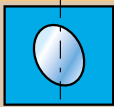
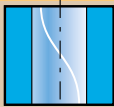
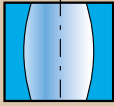
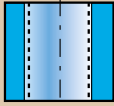
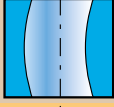
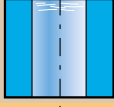
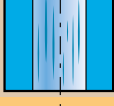
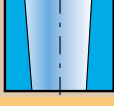
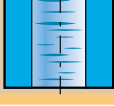
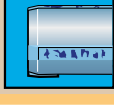
1. Remove the balancing weights from the centre of the wheel.
2. Put the wheel on a balancing axle and place it in the balancing stand.
3. Let the wheel swing back and forth until it stops. Mark the bottom part of the wheel with a chalk stick (1).
4. Place one of the weights (b1) on the opposite side, making the wheel rotate 180 degrees.
5. Thereafter put the weights b2 and b3 uniformly in relation to b1.
6. Move the weights b2 and b3 gradually from each other until the wheel stops to swing. The wheel is now balanced.

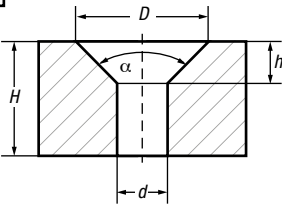
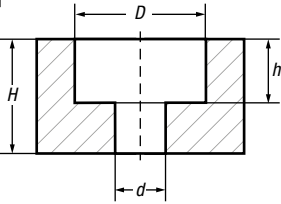
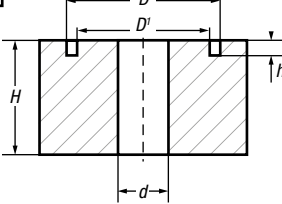
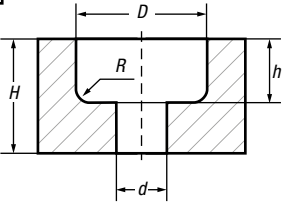
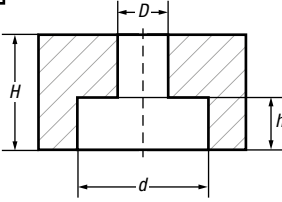
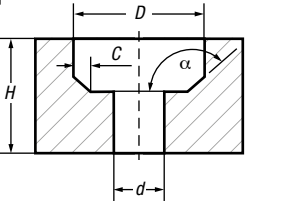




| Type of tools<br>D mm                                                                                                                   | Spare parts |             |          |               |          |          |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------|---------------|----------|----------|
|                                                                                                                                         | Insert      | Centre lock |          | Solid inserts |          |          |
|                                                                                                                                         | Size        | Part No.    | Part No. | Part No.      | Part No. | Part No. |
| WHV 18,0 - 25,0<br>KV 18,0 - 25,0<br>BV 18,0 - 26,0<br>FV 12,0 - 16,5<br>DFV 15,0 - 31,0<br>BFV 15,0 - 31,0<br>NE 13,0/26,0 - 17,0/26,0 | 07          | SSK-20      | TN-6     | SK-3          | SSK-3    | TN-9     |
| WHV 25,5 - 38,0<br>KV 26,0 - 30,0<br>BV 30,0 - 50,0<br>FV 20,0 - 30,0<br>NE 17,0/33,0 - 25,0/40,0                                       | 10          | SSK-22      | TN-7     | SK-3          | SSK-3    | TN-9     |
| WHV 34,0 - 45,0<br>KV 45,0                                                                                                              | 12          | SSK-25      | TN-7     |               |          |          |
| WHV 46,0 -<br>KV 50,0 -<br>NE 25,0/48,0 -                                                                                               | 17          | SSK-40      | TN-15    |               |          |          |

## Troubleshooting

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

| Application                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| <p style="text-align: center;"><b>Type of shank</b></p> <p>Size/Type: .....</p> <p> <input type="checkbox"/> Morse taper<br/> <input type="checkbox"/> Weldon<br/> <input type="checkbox"/> Cylindrical Ø<br/> <input type="checkbox"/> Other type<br/> <input type="checkbox"/> Through coolant </p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p style="text-align: center;"><b>Type of cutting edge</b></p> <p> <input type="checkbox"/> HSS<br/> <input type="checkbox"/> Brazed carbide<br/> <input type="checkbox"/> Carbide inserts<br/> <input type="checkbox"/> Other: ..... </p> | <p style="text-align: center;"><b>Type of coating</b></p> <p> <input type="checkbox"/> TiN<br/> <input type="checkbox"/> TiCN<br/> <input type="checkbox"/> CrN<br/> <input type="checkbox"/> TiAlN (Futura)<br/> <input type="checkbox"/> Other: ..... </p> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <p>Number of tools: .....pcs      Material to be machined: .....</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <p>Comments: .....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <p>Name: ..... Fax: .....</p> <p>Company: ..... Tel: .....</p> <p>Address: ..... Date: .....</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



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