MAXIMATOR®

HOCHDRUCKTECHNIK • HYDRAULIK • PNEUMATIK • PRÜFTECHNIK

# Operating Instructions Coning and Threading Tools


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# Operating Instructions
# Tapering and Threading Tools

## Index:



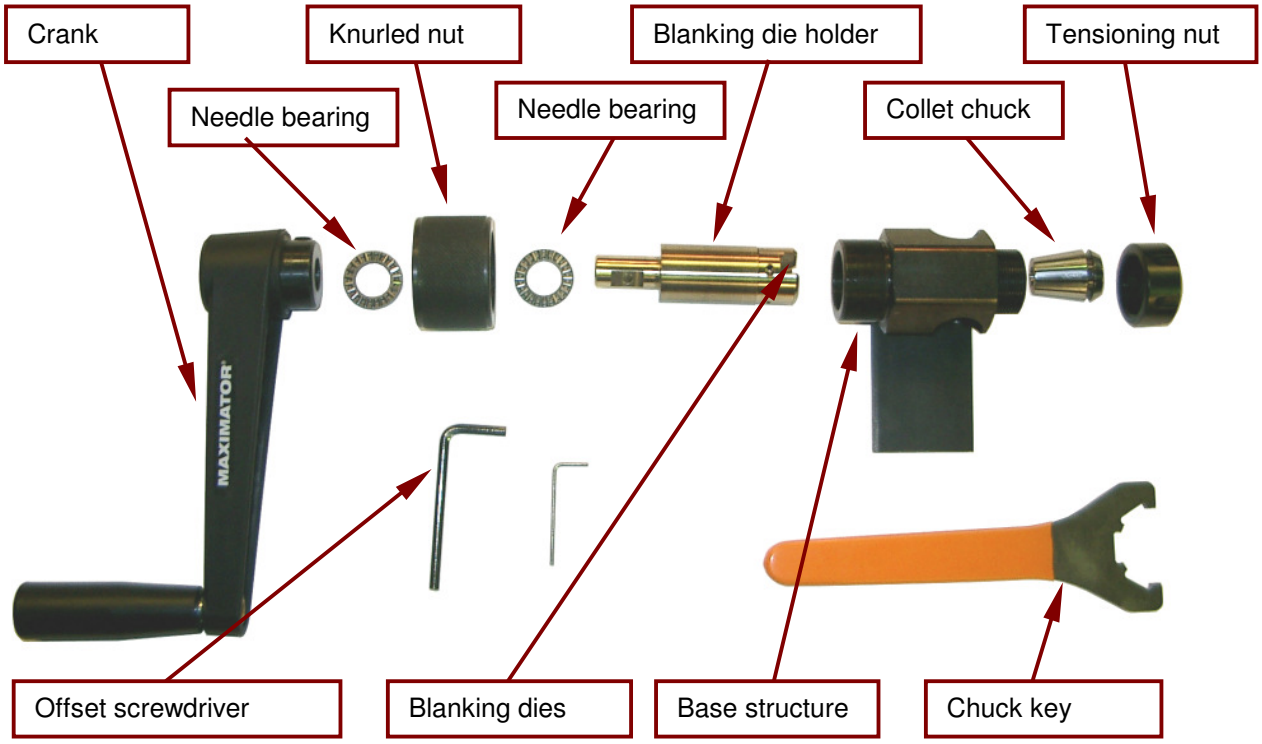
## 1 Safety instructions

Only well-trained staff may operate and assemble the components. It is imperative that the statutory provisions and regulations issued by BG [German Employers' Liability Insurance Association] and other institutions are complied with. In addition, these Operating Instructions have to be thoroughly studied and adhered to. The making of cones and threads is decisive fort he proper functioning and safety of high-pressure connections.

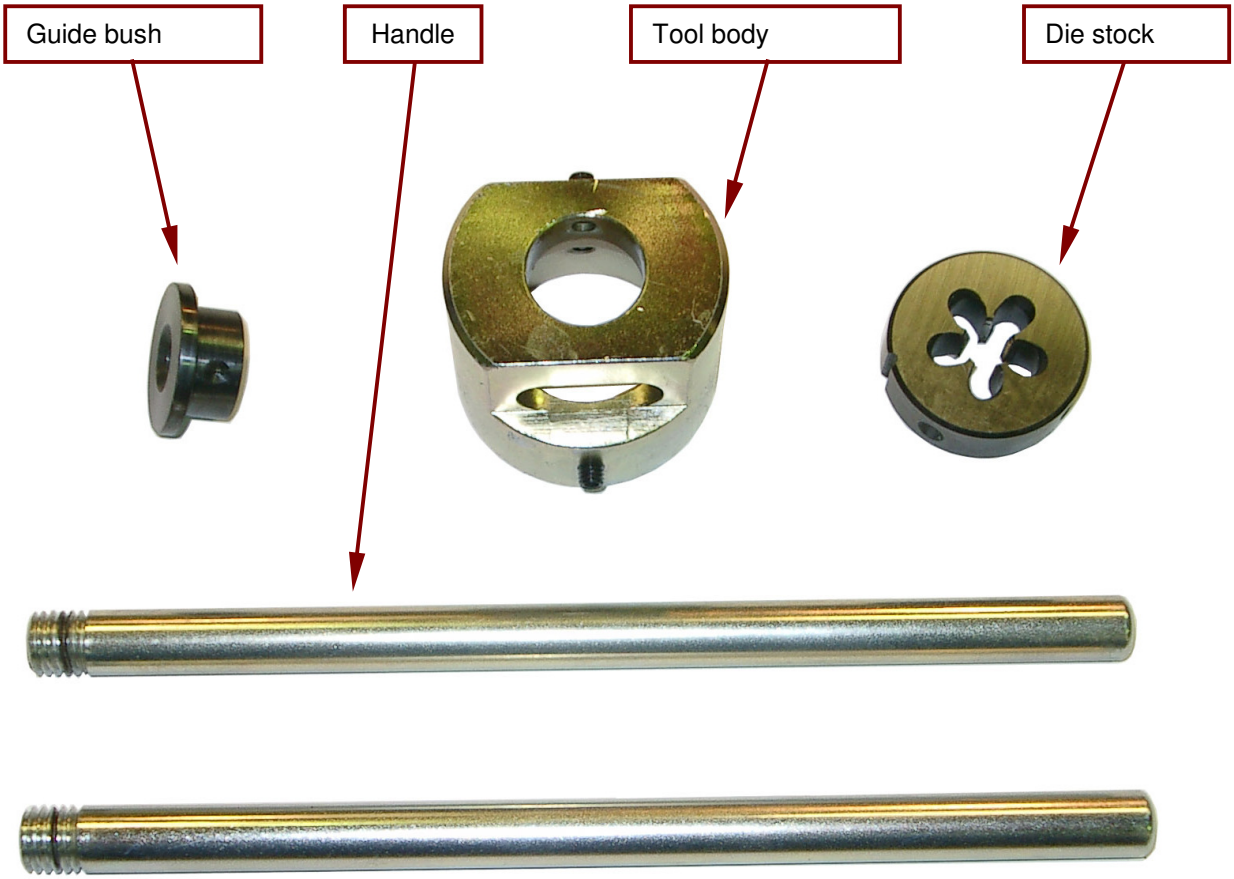
## 2 Mode of functioning / intended use

MAXIMATOR® Tapering and Threading Tools are exclusively employed in the final processing of HP pipes and tubes. Most components of tapering tools are identical for different high-pressure connections. Only different collet chucks and blanking dies have to be employed. Threading tools for the 4500 bar and 1500 bar series are identical. Only guide bushes and die stocks have to be changed for different pipe diameters.

## 3 Component parts and configuration of the coning tool



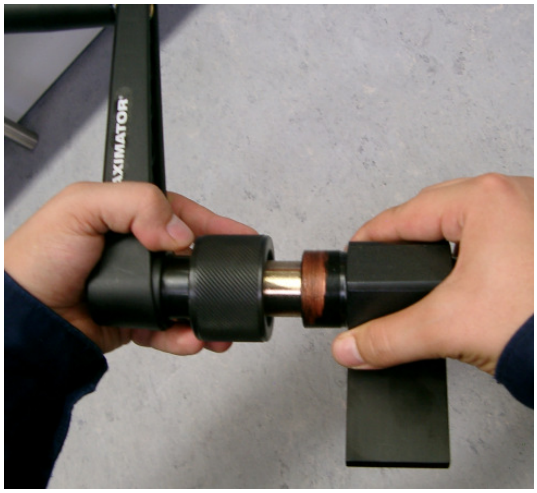

## 4 Component parts and configuration of the threading tool



# 5 Preparation of the coning tool

## 5.1 Disassembly

Remove the knurled nut by unscrewing from the base structure.

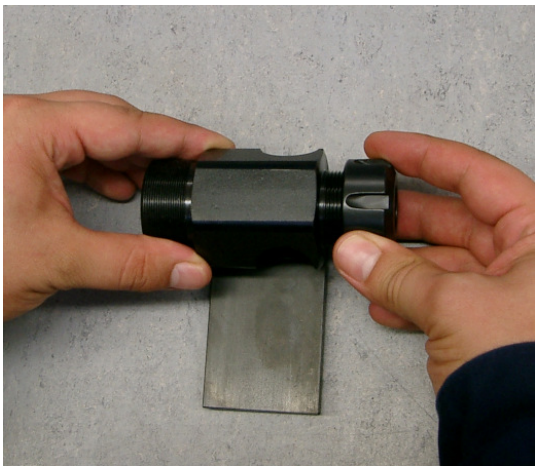


Use the supplied hexagonal offset screwdriver to loosen the headless set screw that keeps the crank handle in its position.

Remove crank handle, knurled nut and needle bearing by pulling from the blanking die holder.

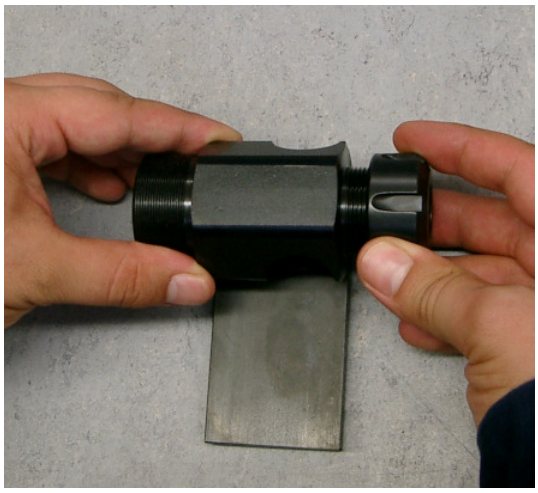
Loosen the 4 headless set screws in the blanking die holder to disassemble the blanking dies. Then remove the blanking from the blanking die holder.

Unscrew the tensioning nut from the base structure. Then push the collet chuck out of the tensioning nut.



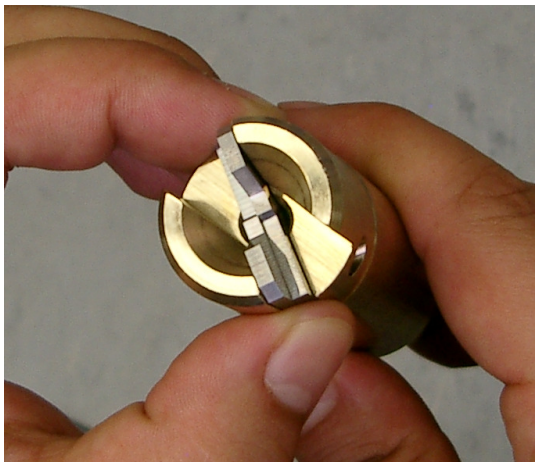
## 5.2 Assembly

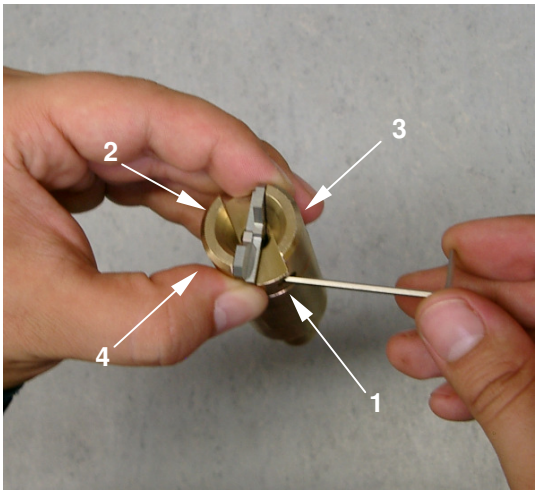
Push the collet chuck into the tensioning nut.



Slightly grease tensioning nut and collet chuck and screw them onto the base structure.

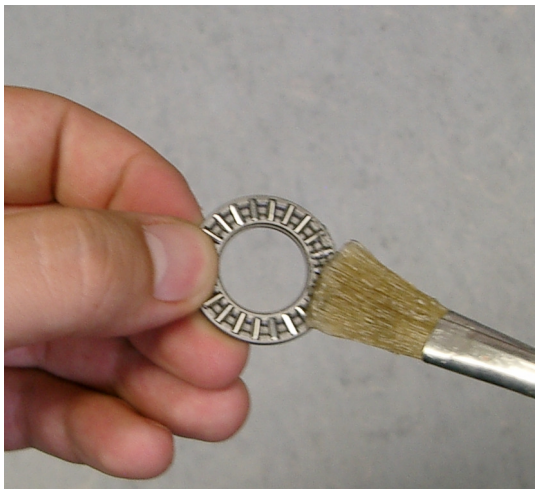
Insert the blanking dies into the blanking die holder as shown in the illustration. Make sure that the labelled Article No. is always on the outside.





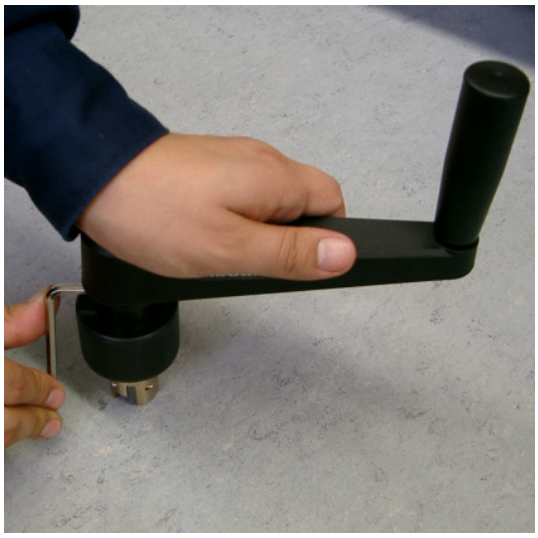

Use the hexagonal offset screwdriver to slightly tighten the headless set screws to align the blanking dies. Make sure to first tighten the headless set screws located opposite the cutting edges (see sequence in the illustration). Thus, the blanking dies with cutting edges fit closely to the blanking die holder. Otherwise the processed taper surface may be uneven.

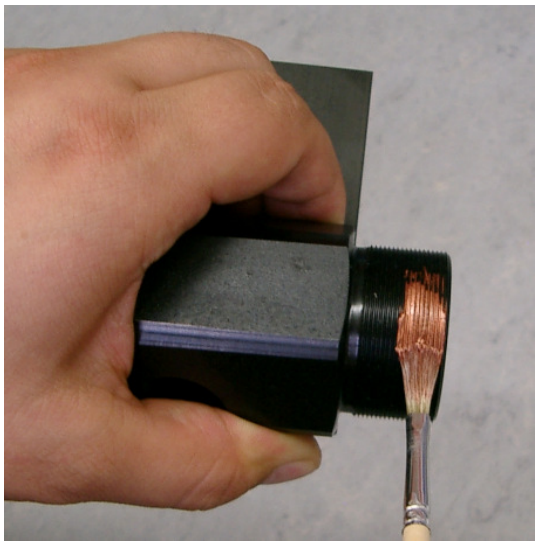
Lubricate the needle bearings with roller bearing grease.



Stick the components onto the blanking die holder in the following sequence: Needle bearing → Knurled nut → Needle bearing → Crank handle.

Align the crank handle and blanking die holder in such a manner that the headless set screw of the crank handle pushes onto the key area at the shaft of the blanking die holder. Press the components together by hand and tighten the headless set screw. Avoid any tangible longitudinal play between crank handle, needle bearings, knurled nut and blanking die holder. A clearance between the components may result in an uneven taper surface.





Lubricate the threads of knurled nut and base structures (We recommend use of solid lubricant. such as copper paste).

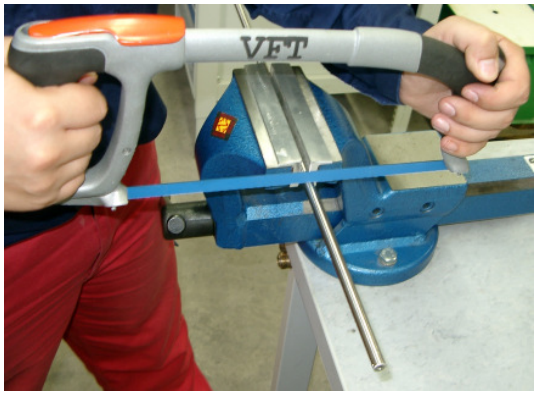
Lubricate the running surface of the blanking die holder.

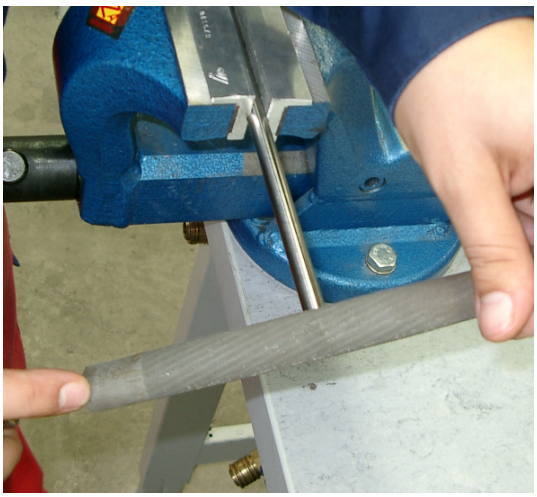
Insert the blanking die holder into the base structure and screw the knurled nut on with a few rotations. Now the coning tool is ready for use.

## 6 Cutting pipework to length

The pipe length is the result of the clear distance of the components to be connected plus the allowance for each connection as shown in Table 2. For processing the face sides, add another 0.5 mm for each end.

Pipe length = Distance + 2 x allowance + 2 x 0.5 mm

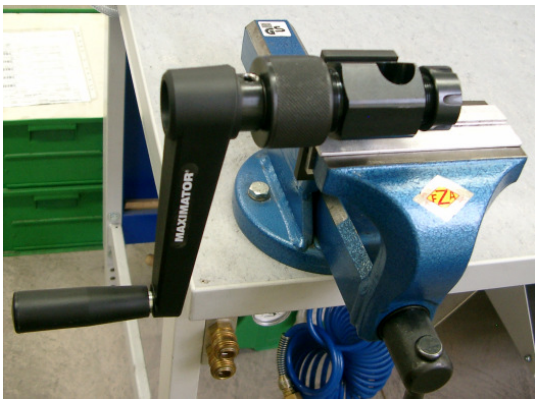


Cut the pipe to the desired length and deburr on the outside so that it can be inserted into the collet chuck of the tapering tool.

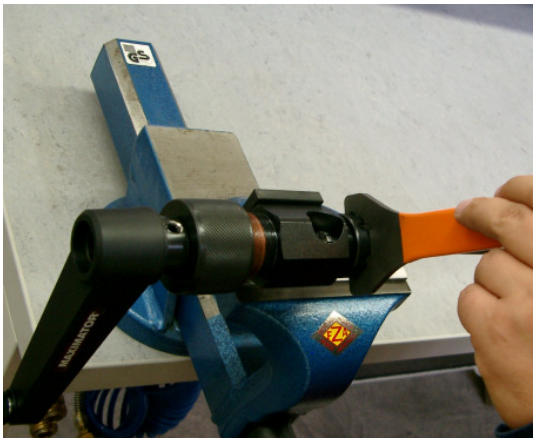
## 7 Taper cutting edges

Clamp the tapering tool at the fixing plate into a vice or clamp it otherwise.



Turn out the knurled screw until only ca. 2 – 3 thread turns are gripping. This corresponds to a distance of 20 mm between knurled nut and the step of the base structures.

Insert the pipe into the collet chuck. Push forward till to the cheek and pull backward for ca.1 mm.

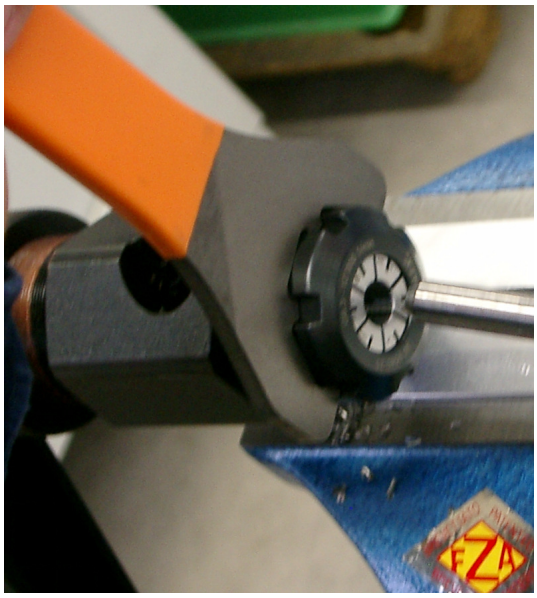


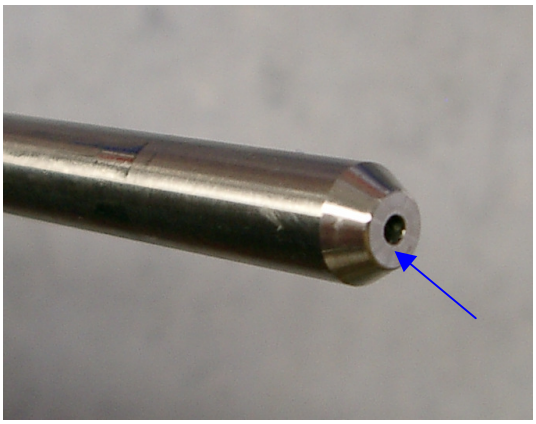
Tighten the tensioning nut with the chuck key. Make sure that all 4 springs of the chuck keys are gripping the tensioning nut slots.

Apply cutting oil onto the blanking dies and pipe end through the side opening in the base structure. Repeat several times during the cutting operation.

Turn the crank handle in clockwise direction and simultaneously provide a slow advance with the knurled nut. Advancing without simultaneous „cranking“ can destroy the blanking dies. To ensure that the taper is completely cut the rotations of the knurled nut can be counted or the advance measured. The number of required rotations corresponds to the necessary advance in mm and can be gathered from Table 2. When ending the cutting operation and in order to obtain a smooth surface turn the crank handle evenly and continuously and reduce the advance speed with the knurled nut. Then stop the advance and continuously perform 3-4 rotations of the crank without moving the knurled nut. Slowly turn back the knurled nut. Thus, an indentation of the blanking on the taper is avoided.

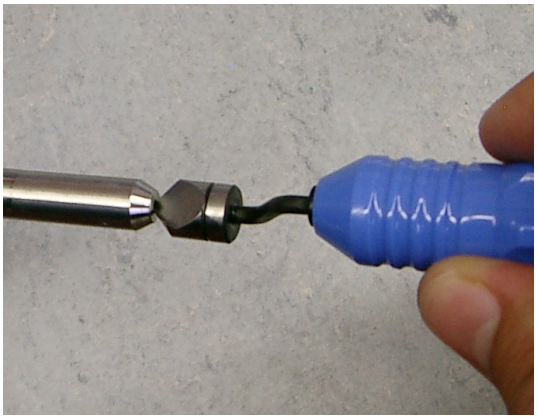
Use the chuck key to loosen the tensioning nut and the pipe can be withdrawn from the tapering tool.





The finished pipe can be recognised by the completely machined face side of the pipe. The taper surface must be free from any damage, such as indentations or scratches. If this is not the case, the pipe can be simply re-machined.

The only work left to do now is deburring of the internal diameter of the finished pipe. Carefully remove all chips that are generated by taper cutting edges and deburring (inside and outside).



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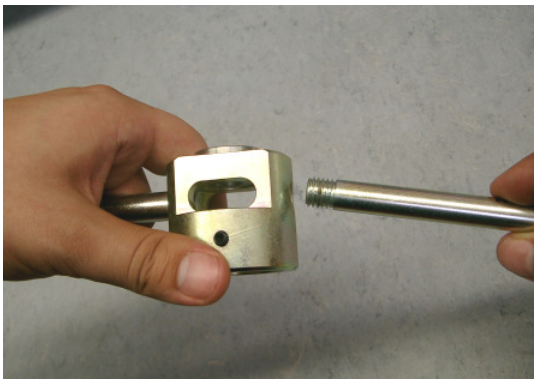
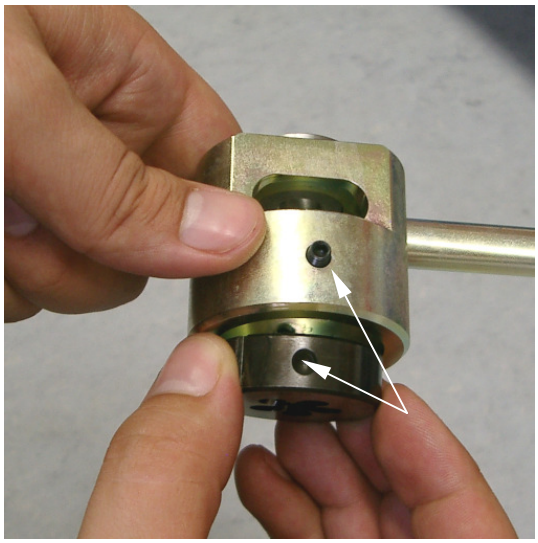
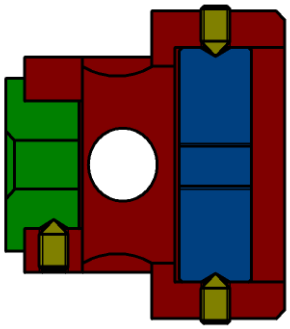
## 8 Preparation of the threading tool

Screw the handles into the tool body.



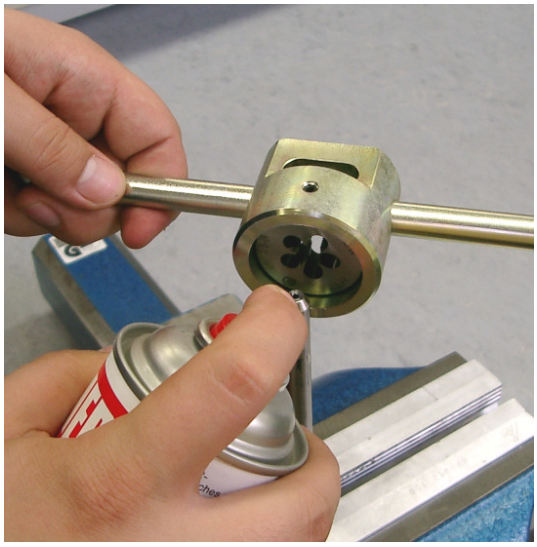


Insert the die stock and guide bush into the tool body and secure with headless set screws. Align the components in such a manner that the headless set screws grip into the recesses.



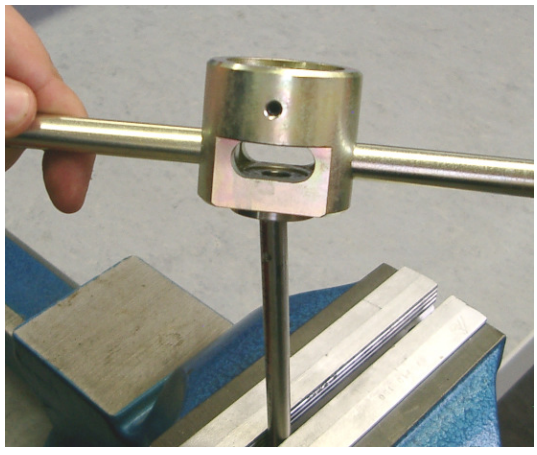
# 9 Threading

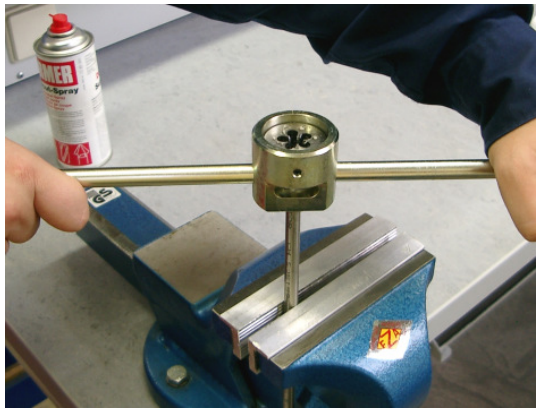
Clamp the HP pipe with the finally machined tapers. Use of protective jaws of aluminium is recommended.



Wet both pipe die stock with cutting oil.

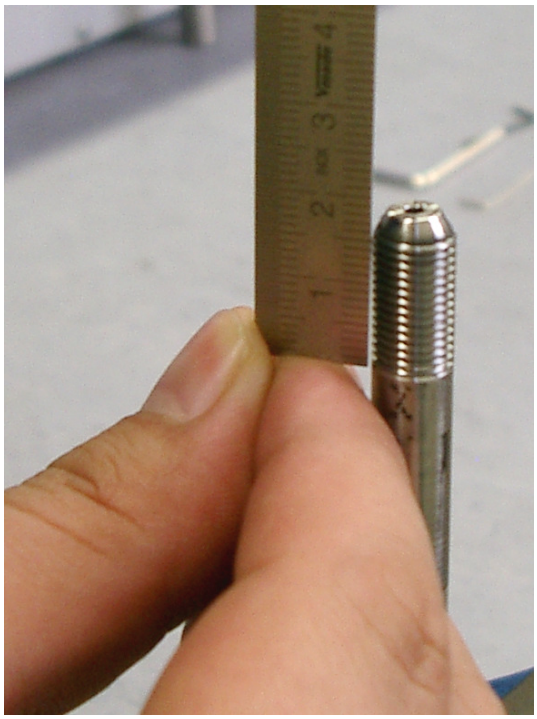
Place the threading tool with guide bush on top of the pipe.





Slightly press down the tool and start the threading operation (in counter-clockwise direction). Rotate the tool briefly in clockwise direction during the threading process in order to break the chip and apply more cutting oil.

For thread lengths see Table 1. Carefully remove chips generated in the threading operation (inside and outside).



# 10 Technical parameters

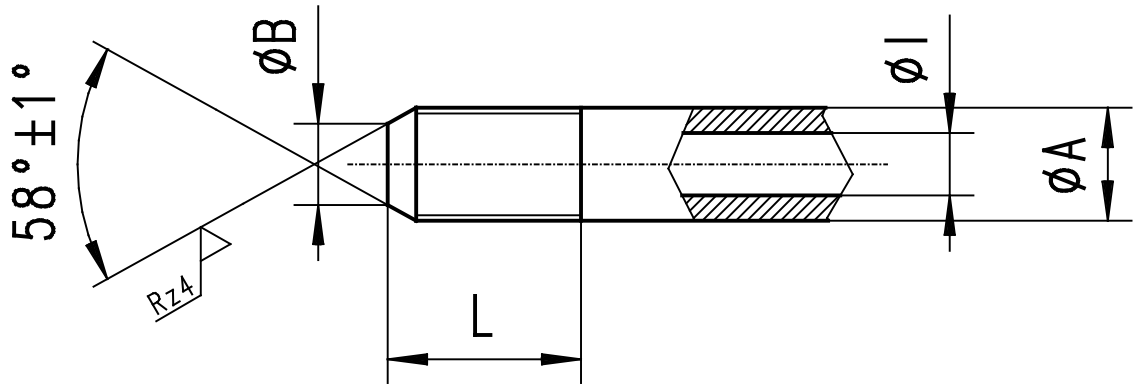
10.1 Pipe ends (Table 1)

| Connection type | ∅ A (mm) | ∅ I (mm) | ∅ B (mm) | L (mm) | UNF Left-handed thread |
|---|---|---|---|---|---|
| 4M | 6.35 | 2.77 | 3.6 | 9 | 1/4-28-LH |
| 4H | 6.35 | 2.11 | 3.2 | 14 | 1/4-28-LH |
| | 6.35 | 1.59 | 3.2 | 14 | 1/4-28-LH |
| 6M | 9.53 | 5.16 | 6.4 | 11 | 3/8-24-LH |
| 6H | 9.53 | 3.18 | 5.6 | 19 | 3/8-24-LH |
| | 9.53 | 1.59 | 5.6 | 19 | 3/8-24-LH |
| 9M | 14.29 | 7.93 | 10.3 | 13 | 9/16-18-LH |
| 9H | 14.29 | 4.78 | 7.1 | 24 | 9/16-18-LH |
| 5U | 7.94 | 1.57 | 3.2 | 17 | 5/16-24-LH |
| 12M | 19.05 | 11.13 | 14.27 | 15.88 | 3/4-16-LH |
| 16M | 25.4 | 14.27 | 18.26 | 19.84 | 1-14-LH |

10.2 Taper (Table 2)

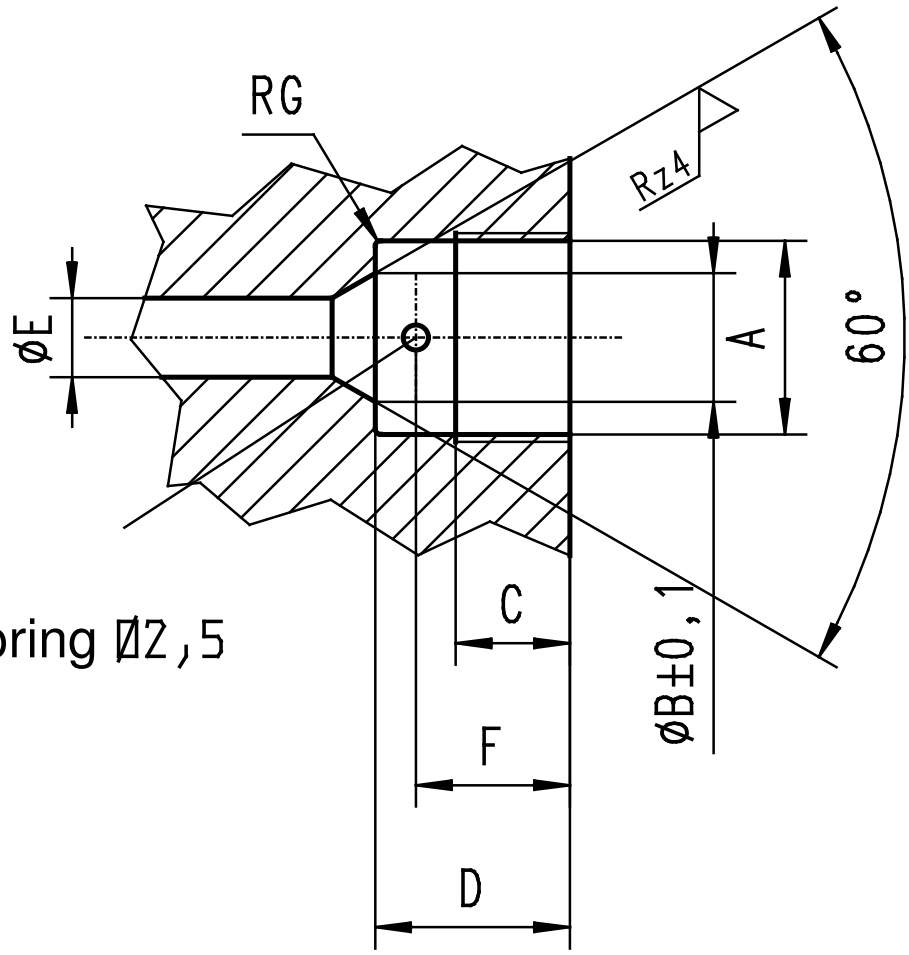
| Connection type | Pipe dimension | | Advance (mm) | Allowance (mm)* |
|---|---|---|---|---|
| | ∅ A (mm) | ∅ I (mm) | Rotations** | |
| 4M | 6.35 | 2.77 | 3 | 14 |
| 4H | 6.35 | 2.11 | 4 | 13 |
| 6M | 9.53 | 5.17 | 4 | 18 |
| 6H | 9.53 | 3.18 | 5 | 18 |
| 9M | 14.29 | 7.93 | 7 | 21 |
| 9H | 14.29 | 4.77 | 9 | 22 |
| 5U | 7.94 | 1.58 | 5 | 32 |

*Allowance for insertion length of pipe into the connection part.
**Number of rotations required to cut the taper.



10.3 Female thread (Table 3)

| Connection type | A | ∅ B (mm) | C (mm) | D (mm) | ∅ E (mm) | F (mm) | G (mm) |
|---|---|---|---|---|---|---|---|
| 4M | 7/16-20 UNF | 4.7 | 7 | 13 | 2.7 | 9.5 | 0.5 |
| 4H | 9/16-18 UNF | 4.2 | 10 | 11.5 | 2.3 | 10 | 0.5 |
| 6M | 9/16-18 UNF | 7.7 | 9.6 | 15.7 | 5.1 | 12.6 | 0.5 |
| 6H | 3/4-16 UNF | 6.5 | 13.5 | 16 | 3 | 13.5 | 1 |
| 9M | 13/16-16 UNF | 12.7 | 11.2 | 19.1 | 7.8 | 15.1 | 0.5 |
| 9H | 1-1/8-12 UNF | 9.7 | 15.7 | 19.1 | 4.8 | 15.7 | 1 |
| 5U | 5/8-18 UNF | 6.2 | 16 | 27 | 2.3 | 23.5 | 1 |
| 12M | 3/4-14 NPS | 15.7 | 12.7 | 23.9 | 13.1 | 18.3 | 0.5 |
| 16M | 1-3/8-12 UNF | 22.4 | 20.6 | 33.3 | 17.5 | 27 | 0.5 |




Relief boring Ø2,5

# 11 Spare parts and accessories

## 11.1 Coning tools


| Connection | Coning tool | Collet chuck | Blanking dies | |
|---|---|---|---|---|
| | | | Kit | Single |
| 4M | CT4M | 3781.1009 | 3781.1014 | 3781.0963 |
| 6M | CT6M | 3781.1010 | 3781.1013 | 3781.0964 |
| 9M | CT9M | 3781.1011 | 3781.1012 | 3781.0965 |
| 4H | CT4H | 3781.1009 | 3781.0843 | 3781.0530 |
| 6H | CT6H | 3781.1010 | 3781.1017 | 3781.0961 |
| 9H | CT9H | 3781.1011 | 3781.1016 | 3781.0962 |
| 5U | CT5U | 3781.0846 | 3781.0843 | 3781.0530 |

## 11.2 Threading tools

| Connection | Threading tool | Guide bush | Die stock |
|---|---|---|---|
| 4M/4H | TT4 | 3781.1055 | 3781.1061 |
| 6M/6H | TT6 | 3781.1053 | 3781.1059 |
| 9M/9H | TT9 | 3781.1054 | 3781.1060 |
| 5U | TT5 | 3781.1052 | 3781.1058 |

## 11.3 Pipe deburring tools

| Pipe size | Pipe deburring tool | Spare cutter blade |
|---|---|---|
| 1/4". 3/8“. 9/16“ | 3780.2555 | 1452.0821 |
| 9/16“. 3/4". 1“ | 3780.2556 | 1452.4605 |

## 12 Personal notes

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