

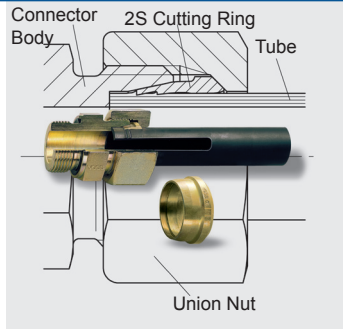
1. Notes

These assembly instructions describe the two assembly options provided for in the German standard DIN 3859 Part 2:

- Direct assembly in the coupling connecting piece
- Pre-assembly in hardened pre-assembly mandrel

We recommend the use of preassembly adaptors for series-production assembly.

The specifications in the respective operating instructions apply to the assembly procedures here.



Compliance with the assembly instructions is extremely important for fulfilling the functions of the 2S cutting ring couplings. Improper handling leads to risks with regard to safety and freedom from leaks, which can also result in the complete failure of the coupling under certain conditions.

2. Tube preparation

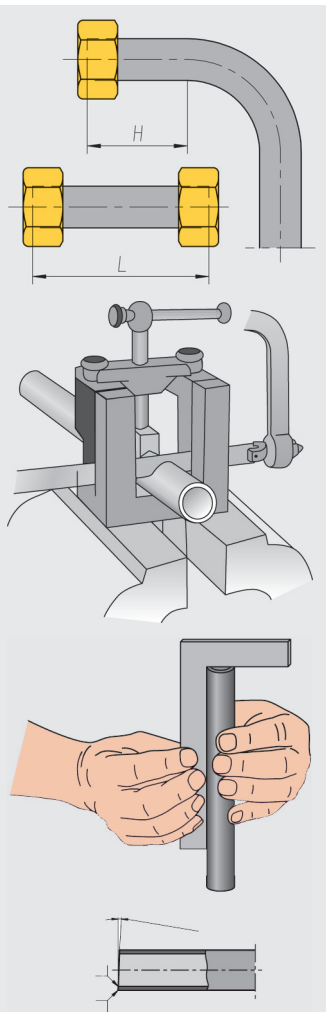
2.1 Minimum dimensions of the straight tube ends must be taken into account for determining the tube lengths. With machine pre-assembly, the minimum lengths are contained in the respective operating instructions of the pre-assembly devices.

Series	Pipe OD	H	L
L	6/ 8	31	39
L	10/12	33	42
L	15	36	45
L	18	38	48
L	22/28	42	53
L	35/42	48	60
S	6/ 8	35	44
S	10/12	37	47
S	14/16	43	54
S	20	50	63
S	25	54	68
S	30	58	72
S	38	65	82

- 2.2 Saw off tube at a right angle. An angular tolerance of $\pm 1^\circ$ is permissible. Do not use tube cutters or abrasive cutting machines.
- 2.3 Slightly deburr tube ends inside and outside. Clean tube.

Caution!

Tubes cut crooked or improperly deburred reduce the service life and freedom from leaks of the coupling. With thin-walled steel tubes or soft tubes of non-ferrous metals, reinforcing sleeves should be used

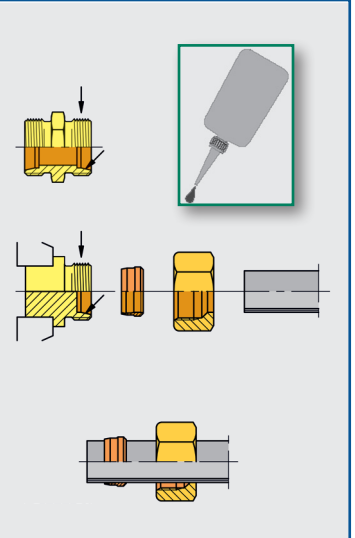


3. Assembly preparation

- 3.1 To simplify assembly, we recommend lubricating the mating pieces of the coupling or the manual preassembly mandrel.
- 3.2 Push the union nut and the 2S cutting ring onto the tube end consecutively. The cutting edges of the 2S cutting ring face the tube end.

Caution!

Ensure the proper position of the 2S cutting ring, or otherwise incorrect assembly will result.



4. Direct assembly in coupling connecting piece

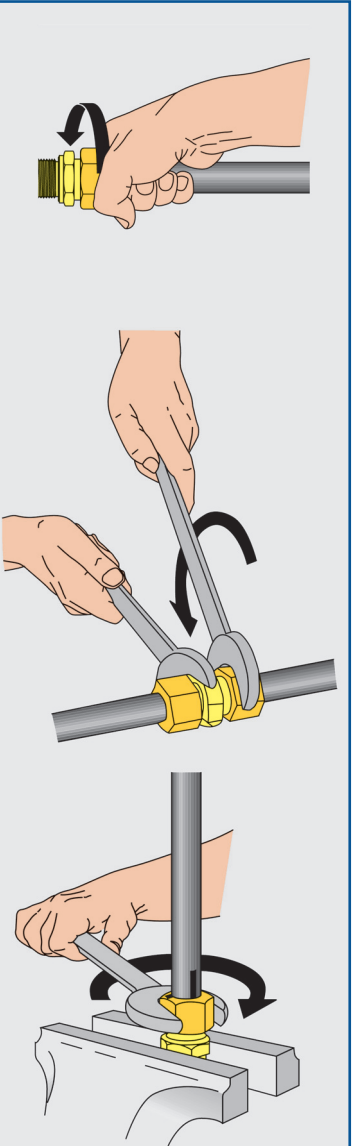
- 4.1 Insert the tube end into the coupling connecting piece as far as possible and press on. During the assembly process the tube must be held on the stop to prevent incorrect assembly.
- 4.2 Screw on the union nut by hand until the coupling connecting piece, the 2S cutting ring and the union nut are felt to make contact.
- 4.3 Tighten the union nut with the open-end spanner.
- up to a tube OD of 18 mm 11/2 turns
 - from a tube OD of 20 mm 11/4 turns

Notes:

- For assembly within the tube, tighten the coupling connecting piece with a spanner.
- To comply with the specified number of turns, it is recommended that marking lines be applied to the union nut and the tube.
- The assembly specification in 4.3 also applies to pre-assembly in a vice.

Caution!

- Each coupling body may only be used once for initial assembly. In the case of multiple use, malfunction can occur
- Following assembly a visual inspection including checking of the correct assembly is absolutely necessary (see point 6 Checking).



5. Pre-assembly in hardened pre-assembly mandrel

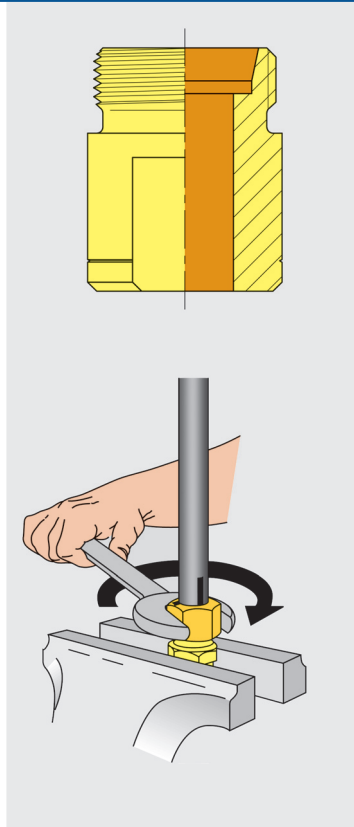
The hardened pre-assembly mandrel is wear-resistant and enable uniform assembly results, as they are more closely tolerated. They should be checked for trueness to gauge size after approx. every 50 pre-assemblies.

Replace pre-assembly mandrels which are not true to gauge size or are damaged in the cone area to prevent incorrect assembly.

- 5.1 Insert the tube end into the preassembly mandrel as far as possible and press on. During the assembly process the tube must be held on the stop to prevent incorrect assembly.
- 5.2 Screw on the union nut by hand until the pre-assembly mandrel, the 2S cutting ring and the union nut are felt to make contact.
- 5.3 Tighten the union nut with the open-end spanner.
 - up to a tube OD of 18 mm 11/2 turns
 - from a tube OD of 20 mm 11/4 turns

Caution!

Following each pre-assembly a visual inspection including checking of the correct assembly is absolutely necessary (see point 6 Checking).

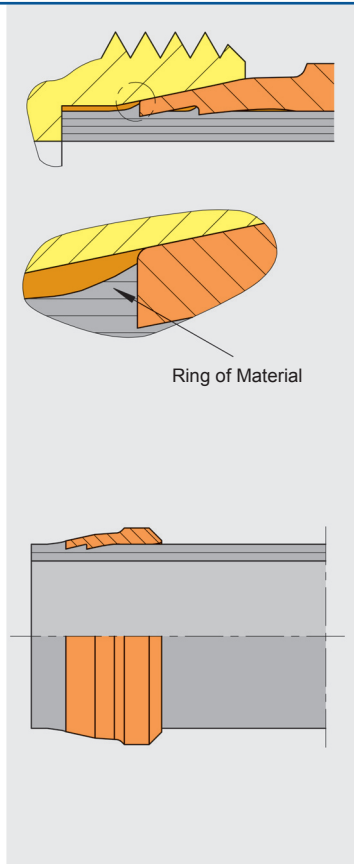


6. Checking

Unscrew union nut and check the ring penetration. The shoulder ring of material must cover at least 80% of the cutting edge face surface. It may be possible to turn the cutting ring on the tube in this position. Potential loose material must be removed.

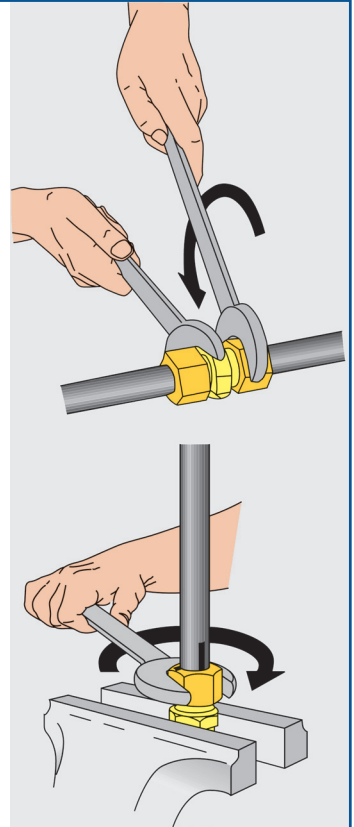
Caution!

If the shoulder ring of material is insufficient, repeat assembly with application of increased force. The result must be checked again.



7. Finish assembly

- 7.1 Carefully reinsert the tube end mounted in the coupling connecting piece in which it was assembled. Then tighten the union nut hand-tight and stress-free.
 - 7.1.1 Tighten union nut with spanner (without extension) up to noticeable increase in force. Then tighten another 1/4 turn.
- 7.2 Carefully insert the tube end preassembled in the hardened preassembly mandrel or machine pre-assembled in a (new) coupling connecting piece not yet used for assembly and tighten the union nut hand-tight and stress-free.
 - 7.2.1 Tighten union nut with spanner (without extension) up to noticeable increase in force. Then tighten by another 1/4 turn.



8. Repeat assembly

Repeat assemblies can be carried out on the tube coupling as often as desired. When doing so, the union nut is tightened again with the same amount of force as during the initial assembly.

9. Tightening torques
Distance-dependent assembly can be checked by checking the torque applied. The tightening torques are approximate values. They were determined under the following conditions:

- Seamless precision steel tubes according to EN 10305-1
- Tube material 1.0255+N according to DIN 1630, condition on delivery NBK
- Coupling components galvanised (A3C according to DIN/ISO 4042) Union nuts also waxed.

Series	Tube OD x s	Tightening Torque Nm ±5 %
L	6x1	20
L	8x1	28
L	10x1/1,5	42/45
L	12x1/1,5	60/65
L	15x1,5/2/2,5	85/85/100
L	18x1,5/2/2,5	125/145/150
L	22x1,5/2	175/195
L	28x2/3	215/250
L	35x2/3	300/395
L	42x2/3/4	340/450/500
Series	Tube OD x s	Tightening Torque Nm ±5 %
S	6x1,5/2	30/35
S	8x1,5/2/2,5	40/45/45
S	10x2/2,5/3	50/60/60
S	12x2/2,5/3	70/75/75
S	14x2/3/4	100
S	16x2/3	120
S	20x3/3,5	210
S	25x4/4,5	250/290
S	30x4/5	350
S	38x5/6	600

Caution!

The shoulder ring of material must be checked. (see 6. Checking)