STAINLESS STEEL 1.4571 TECHNICAL INFORMATION

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1. General

By virtue of the wide range produced our stainless steel threaded pipe fittings and components made on of noncorroding steel (type 1.4571) are used in many areas of fluid technology. The range gets constantly expanded and adapted to the latest technical requirements and developments. Our modular principle enables us to resolve any connection and adaptation problems easily and reliably. All product lines are fully available and manufactured with high precision. Components and custom parts (the latter following agreement of the technical details) can be supplied at short notice. In order to ensure complete reliability, all parts must be correctly fitted and the way in which the pipes are laid must leave them free of any tension. Our products fulfil the licensing conditions of international classification organisations.

2. Description of how the threaded pipe fittings work

The starting point is formed by threaded fittings as per DIN 2353, ISO 8434 with bore shape W, DIN 3861 (24° cone) and their unions as standard construction elements. All of the threaded fitting types below fundamentally represent functional and watertight connections between union and pipe. Which type is chosen in each instance should be matched to the technical requirements. Where the unions are the same, it is possible to switch our different systems on the pipe connection side.

2.1 Dual cutting edge ring screw fitting

In most cases where a screw fitting is required benefits are achieved by using the dual cutting edge ring. As the union nut is tightened, initially the front cutting edge grips into the pipe and as it is tightened further the second cutting edge does so. Once the functional incisions of the cutting edges have finished, any further penetration is restricted by the cutting ring's design. At the same time, the ring has become wedged between pipe and union. This achieves a positive lock in both radial and axial direction. Thanks to the shape and high degree of positive locking any forces that arise get efficiently spread across the whole cone length. This achieves optimum resistance to vibration and a high level of reliability against flexural fatigue stress or fluctuations in pressure or temperature. By virtue of the high surface quality it is possible to achieve relatively advantageous levels of tightening torque. The noticeable increase in torque (after the cutting edges take grip as intended) makes it easy to spot any risk of 'over tightening'. Slight 'over tightening' does not impair the overall function.





Before tightening the union nut

After tightening the union nut

2.2 Flared fitting

The flared fitting achieves a secure connection between unions with bore shape W DIN 3861 and 37^e-flared pipe ends. Fitting is easy and can be repeated any number of times. You guide the tapered ring (with O-rings inserted) as far as it will go into the union. By virtue of its shape it sits tightly inside the union, gently clamped in place. As the union nut is tightened, the pressure ring pushes onto the pre-formed flaring of the pipe, which conversely presses itself onto the 37° cone of the tapered ring. The metallic/ elastomer seal ensures that the most secure connection conceivable. The complete threaded fitting withstands high loading and protects against flexural fatigue forces and vibration. Even relatively great temperature fluctuations do not impair the connection's function. Nevertheless, the maximum permitted temperatures for the sealing materials used do need to be observed. This applies to all threaded fittings with elastomer seals!



2.3 Welded taper joints

Threaded pipe joints using welded tapers represent the logical extension of cutting ring threaded joints. The same unions based on bore shape W DIN 3861 and corresponding union nuts can be used, resulting in an identical fitted height. A secure and watertight connection between welded taper and union is provided by the metallic seal and additionally inserted O-ring. It withstands even extreme stress, especially from hydraulic shocks, vibration or temperature fluctuations.

Caution! Due to the build up of heat, the taper must be welded to the pipe before the O-ring is fitted.



2.4 Conical hose fitting

Thanks to the connecting cone used (24°) it is possible to perform a norm-compliant threaded connection with a union (bore shape W as per DIN 3861). The O-ring additionally fitted inside the cone creates a metallic/elastomer seal, which ensures that the join is highly leak-proof. Even under high levels of loading, it is insusceptible to hydraulic shocks or vibrations. Fitted dimensions are as for DIN 2353 and ISO 8434 specifications for threaded fittings. Pipe connection lines can optionally be fitted with cutting ring, tapered or welded taper joints.



3. Usage criteria

In order to make the correct choice of appropriate threaded pipe connection, the user should consider some fundamental criteria. Starting with the known facts, requirements and expectations should be attached to the threaded joint system, with priority being given to the maximum expectation of how secure it is to be.

Particular attention should be paid to:

- maximum compressive strength (taking into account temperature-related pressure reductions)
- sealing material's temperature sensitivity (the resistance is e.g. for FPM between -25 and +200°C)
- Fitted measurements
- Service life, including where fitted repeated times
- Possibility of switching between different types of threaded pipe joint.

4. Standards and norms

The standard range of stainless steel threaded pipe fittings conforms to DIN 2353, ISO 8434 (overview).

Cutting ring screw fittings: Are normally supplied with the double edge cutting ring (P-DR).

Flared screw fittings: SAE J 514 / ISO 8434 with additional O-ring on the 37°-cone of the tapered ring.

Welded taper joints and conical hose fittings: DIN 3865/ ISO 8434-4

Union nut for welded taper joint: DIN 3870

Pipe connection sides: DIN 3861 and ISO 8434-1 **Metric and pipe thread:** DIN 3852, parts 1 and 2

NPT thread: ANSI/ASME B 1.20.1-1983

UN/UNF thread: SAE J 514

Component materials as per DIN 3859: X6CrNiMoTi as per DIN 17440 material no. 1.4571

Sealing ring: FPM (e.g. Viton), PTFE (e.g. Telefon) on request.

5. Pressure ranges, temperatures and pressure reductions

In respect of resistance to pressure a difference is made between nominal pressure PN and operating pressure PB. With reference to how secure a join is, that is dependent on the permitted operating temperature TB, which in turn relates to the material and the screw connection system. To ensure it is as secure as possible, it is essential to take pressure reductions into account.

5.1 Nominal pressure PN

In relation to the pressure, nominal pressure is a common and rounded reference figure (see DIN 2401) and is stated under static loading in the following table with a min. 4-fold safety reserve. Only in the case of outer pipe diameters of 30mm and more ('S' line) and pressure levels of above 300 bar is a c. 3-fold safety reserve cited. The figures relate to cutting ring and tapered threaded fittings.

Row	Ra	Nominal pressure PN
LL (very light)	4 - 8	100
L (light)	6 - 15	250
	18 - 22	160
	28 - 42	100
S (heavy)	6 - 14	630
	16 - 25	400
	30 - 38	250

5.2 Operating pressure PB

The permitted operating pressure for a component is the highest internal excess pressure that is allowed for that component by reason of the material and of the calculation parameters at the permitted operating pressure TB in trouble-free operation (DIN 2410). In the case of composite threaded fittings the pressure restriction must relate to the lowest pressure. Under normal operating conditions nominal pressure PN and operating pressure PB are roughly identical. However, in the event of strong hydraulic shocks, relatively high temperatures and mechanical vibrations, lower operating pressures should be selected.

5.3 Temperatures

The permitted operating temperatures TB for threaded joint materials made of stainless steel are between – 60 and + 400° C (DIN 17440).

For sealing materials note the following:

- FPM (e.g. Viton) -25 to +200°C
- PTFM (e.g. Teflon) -60 to +200°C

These are guideline figures, which can also still be influenced to a greater or lesser degree by the medium. If in doubt or if using different materials within one threaded fitting, the lowest respective temperature limits are to be applied.

5.4 Pressure reductions

In the event of increased or low temperatures pressure reductions (in the table below related to material 1.4571) are to be applied.

Temperature	Pressure reduction
-60 to 20 °C	-
+50 °C	4.50 %
+100 °C	11.00 %
+200 °C	20.00 %
+300 °C	29.00 %
+400 °C	33.00 %

The respectively applicable norms and regulations, which, with reference to pressure levels, temperatures and how secure the join is, deviate for special applications from the table above, are without effect.

6. Male connectors/screw holes for threaded joints

Metric DIN-ISO thread (cylindrical) DIN 13 - T5 - T7, ISO 724. Whitworth pipe thread (cylindrical) DIN-ISO 228 - T1



de

Male connector shape B DIN 3852 T21, ISO 1179-4 Sealing by seal edge

Male connector shape E DIN 3852 T11, ISO 1179-2 Sealing by soft seal (WD)

Screw hole shape X, Y as per DIN 3852 T2, ISO 1179-1 (for cylindrical and conical screw-in thread)



d ₁	d3	d 4 ^{+0,4}	d _s	a _{1 max}	mm	mm	W
M 8 x 1	12	13	12,0	1,0	8	13,5	0,1
M 10 x 1	14	15	14,0	1,0	8	13,5	0,1
M 12 x 1,5	17	18	17,0	1,5	12	18,5	0,1
M 14 x 1,5	19	20	19,0	1,5	12	18,5	0,1
M 16 x 1,5	21	22	21,9	1,5	12	18,5	0,1
M 18 x 1,5	23	24	23,9	2,0	12	18,5	0,1
M 20 x 1,5	25	26	25,9	2,0	14	20,5	0,1
M 22 x 1,5	27	28	27,0	2,5	14	20,5	0,1
M 26 x 1,5	31	32	31,9	2,5	16	22,5	0,2
M 27 x 2	32	33	32,0	2,5	16	24,0	0,2
M 33 x 2	39	40	39,9	2,5	18	26,0	0,2
M 42 x 2	49	50	49,9	2,5	20	28,0	0,2
M 48 x 2	55	56	55,0	2,5	22	30,0	0,2
G 1/8" A	14	15	14,0	1,0	8	13,0	0,1
G 1/4" A	18	19	18,9	1,5	12	18,5	0,1
G 3/8" A	22	23	22,0	2,0	12	18,5	0,1
G 1/2" A	26	27	26,9	2,5	14	22,0	0,1
G 3/4" A	32	33	32,0	2,5	16	24,0	0,2
G 1" A	39	40	39,9	2,5	18	27,0	0,2
G 1 1/4" A	49	50	49,9	2,5	20	29,0	0,2
G 1 1/2" A	55	56	55,0	2,5	22	31,0	0,2

Metric conical outer thread DIN 158 Whitworth pipe thread (conical) DIN 385 8



Male connector shape C DIN 3852 T2 Sealing by tapered thread

Screw hole shape Z as per DIN 3852 T2 (for conical screw-in thread only)**



d ₂	b _{2 min}	t _{3 min}
con.	5.5	10.0
con.	5.5	10.0
1.5 con.	8.5	13.5
1.5 con.	10.5	15.5
1.5 con.	10.5	15.5
1/8 con.	5.5	9.5
1/4 con.	8.5	13.5
3/8 con.	8.5	13.5
1/2 con.	10.5	16.5

6. Male connectors/screw holes for threaded joints

Metric ISO thread = DIN 3852 / ISO 6149 UNF 1 UN thread = SAE J 514, ISO 11926



d ₁	Ds	d _{4 min}	d3	d 2 ^{+0,1}	a _{1 max}	a ₂	t _{1 min}	b _{1 min}	a±1º
M 8 x 1	10.9	17	11	9.1	1.0	1.6	11.5	10.0	12°
M 10 x 1	12.9	20	13	11.1	1.0	1.6	11.5	10.0	12°
M 12 x 1.5	16.9	22	16	13.8	1.5	2.4	14.0	11.5	15°
M 14 x 1.5	18.9	25	18	15.8	1.5	2.4	14.0	11.5	15°
M 16 x 1.5	20.9	27	20	17.8	1.5	2.4	15.5	13.0	15°
M18 x 1,5	22.9	29	22	19.8	2.0	2.4	16.5	14.5	15°
M 20 x 1.5	24.9	32	24	21.8	2.0	2.4	16.5	14.0	15°
M 22 x 1.5	26.9	34	26	23.8	2.0	2.4	18.0	15.5	15°
M 26 x 1.5	30.9	37	31	29.05	2.0	3.1	18.5	16.0	15°
M 27 x 2	31.9	40	32	29.4	2.0	3.1	22.0	19.0	15°
M 33 x 2	37.9	46	38	35.4	2.5	3.1	22.0	19.0	15°
M 42 x 2	47.9	56	47	44.4	2.5	3.1	22.5	19.5	15°
M 48 x 2	54.9	64	53	50.4	2.5	3.1	25.0	22.0	15°
7/16-20 UNF	14.4	21	15	12.4	1.6	2.4	14.0	11.5	12°
9/16-18 UNF	17.6	25	18	15.6	1.6	2.5	15.5	12.7	12°
3/4-16 UNF	22.3	30	23	20.6	2.4	2.5	17.5	14.3	15°
7/8-14 UNF	25.5	34	26	23.9	2.4	2.5	20.0	16.7	15°
1.1/16-12 UN	31.9	41	32	29.2	2.4	3.3	23.0	19.0	15°
1.5/16-12 UN	38.2	49	39	35.5	3.2	3.3	23.0	19.0	15°
1.5/8-12 UN	47.7	58	48	43.5	3.2	3.3	23.0	19.0	15°

Screw hole shape W with O-ring seal DIN 3852 T3, ISO 6149 + SAE J 514



Male connector NPT ANSI/ASME B1.20.1-1983

Screw-in hole NPT ANSI/ASME B1.20.1-1983

d ₁	t _{3 min}	b _{2 min}
1/8-27 NPT	11.6	6.9
1/4-18 NPT	16.4	10.0
3/8-18 NPT	17.4	10.3
1/2-14 NPT	22.6	13.6
3/4-14 NPT	23.1	14.1
1-11.5 NPT	27.8	16.8
1.1/4-11.1/2 NPT	28.3	17.3
1.1/2-11.1/2 NPT	28.3	17.3

7. Pipe joint measurements for unions

Screwed end as per DIN 3853/ISO 8434-1 Hole shape W as per DIN 3861



Row/Type	PN	Ra	G	d ₁	d ₉ ^{B11}	d 11 ^{+0,1}	i,	t _s
LL	100	4	M 8 x 1	3.0	4	5.0	8	4.0
		6	M 10 x 1	4.5	6	7.5	8	5.5
		8	M 12 x 1	6.0	8	9.5	9	5.5
Row/Type	PN	Ra	G	d ₁	d 9 ^{B11}	d 11 ^{+0,1}	İ3	ts
L	250	6	M 12 x 1.5	4.0	6	8.1	10	7.0
		8	M 14 x 1.5	6.0	8	10.1	10	7.0
		10	M 16 x 1.5	8.0	10	12.3	11	7.0
		12	M 18 x 1.5	10.0	12	14.3	11	7.0
		15	M 22 x 1.5	12.0	15	17.3	12	7.0
L	160	18	M 26 x 1.5	15.0	18	20.3	12	7.5
		22	M 30 x 2	19.0	22	24.3	14	7.5
L	100	28	M 36 x 2	24.0	28	30.3	14	7.5
		35	M 45 x 2	30.0	(35.3 + 0.1)	38.0	16	10.5
		42	M 52 x 2	36.0	(42.3 + 0.1)	45.0	16	11.0
Row/Type	PN	Ra	G	d1	d 9 ^{B11}	d 11 ^{+0,1}	İ3	t _s
S	630	6	M 14 x 1.5	4.0	6	8.1	12	7.0
		8	M 16 x 1.5	5.0	8	10.1	12	7.0
		10	M 18 x 1.5	7.0	10	12.3	12	7.5
		12	M 20 x 1.5	8.0	12	14.3	12	7.5
		14	M 22 x 1.5	10.0	14	16.3	14	8.0
S	400	16	M 24 x 1.5	12.0	16	18.3	14	8.5
		20	M 30 x 2	16.0	20	22.9	16	10.5
		25	M 36 x 2	20.0	25	27.9	18	12.0
S	250	30	M 45 x 2	25.0	30	33.0	20	13.5
		38	M 52 x 2	32.0	(38.3 + 0.1)	41.0	22	16.0

8. Pipe recommendations

Seamlessly extruded pipes made of stainless steels of material nos. 1.4571 or 1.4541, finish type m as per EN 10216-5 with pipe outer diameter tolerances as per tolerance class D 4 and wall thickness levels as per tolerance class T 4 DIN ISO 1127, part 1. Max. hardness: HRB 90.

Stainless steel pipes

Material no. 1.4571 Tolerances as per EN 10305-1, part 1.

Permitted temperature range and material-related necessary pressure reductions compared to the calculation pressures at increased temperatures correspond to the reduction of the 1% expansion limit (EN 10216-5).

da Outer Ø	Tolerance	s Wall thickness	di Inner Ø	1.4571 calculation pressure DIN 2413	1.4571 1 Burst pressure	Weight
mm	±	mm	mm	bar	bar	kg/m
6	0.10	1.0	4	426	2340	0.125
8	0.10	1.0	6	368	1660	0.175
8	0.10	1.5	5	472	2800	0.244
10	0.10	1.0	8	294	1290	0.225
10	0.10	1.5	7	389	1930	0.319
10	0.10	2.0	6	498	3100	0.401
12	0.08	1.0	10	245	1220	0.275
12	0.08	1.5	9	368	1580	0.394
12	0.08	2.0	8	426	2380	0.501
14	0.08	1.5	11	315	1550	0.469
14	0.08	2.0	10	420	2180	0.601
14	0.08	2.5	9	452	2800	0.720
15	0.08	1.0	13	196	860	0.351
15	0.08	1.5	12	294	1140	0.507
15	0.08	2.0	11	392	1750	0.651
16	0.08	2.0	12	368	1800	0.701
16	0.08	2.5	11	403	2120	0.845
16	0.08	3.0	10	472	2800	0.977
18	0.08	1.5	15	245	1050	0.620
18	0.08	2.0	14	327	1520	0.801
20	0.08	2.0	16	294	1250	0.901
20	0.08	2.5	15	368	1550	1.095
20	0.08	3.0	14	389	1960	1.277
22	0.08	1.5	19	200	720	0.770
22	0.08	2.0	18	267	1020	1.002
25	0.08	2.5	20	294	1190	1.408
25	0.08	3.0	19	353	1520	1.653
28	0.08	1.5	25	158	620	0.995
28	0.08	2.0	24	210	880	1.302
30	0.08	3.0	24	294	1140	2.028
30	0.08	4.0	22	392	1650	2.605
35	0.15	2.0	31	168	670	1.653
38	0.15	4.0	30	309	1240	3.405
38	0.15	5.0	28	387	1680	4.131
42	0.20	2.0	38	140	520	2.003
42	0.20	3.0	36	210	860	2.930
Onerating	temnerature	60° to +20°C	50%	100°C	200°C 300°C	400°C

Operating temperature	60° to +20°C	50°C	100°C	200°C	300°C	400°C
Pressure reductions in %	-	4.5	11	20	29	33

9. Use of reinforcing sleeves

Reinforcing sleeves essential. Reinforcing sleeves necessary for heavily loaded lines (vibrations).

10. Fitting instruction as per DIN 3859

In order to obtain perfect pipe joints, some basic requirements need to be met when fitting all threaded joint systems. Improper fitting can lead to the joints not functioning properly and make them less than fully secure.

10.1 Preparing the pipe

- 1. Cut off pipes at right angles. Angle deviation of up to $1\!\!/^\circ$ to the pipe axis is permissible. Do not use a pipe cutter.
- 2. At the cut edges lightly deburr pipe on inside and outside. Bevel up to 0.2 x 45° is permissible. Clear away filings and debris.
- 3. In the case of elbows attention must be paid to the minimum height of the straight pipe end up to bend radius. It must be at least twice the height of the union nut.



10.2 Assembling cutting ring threaded fittings

Pipes made of stainless steels are to be pre-assembled in hardened pre-assembly mandrels or corresponding devices. This is also advisable for volume assembly using components made of other materials. **Note:** Use our 'Fettpaste 325' grease!

10.2.1 Assembly using hardened pre-assembly mandrels

- 1. Lightly grease thread of the union nut, thread and cone of the pre-assembly mandrel and cutting ring with 'Fettpaste 325'.
- 2. Push union nut and cutting ring onto the pipe. Ensure cutting ring is in correct position.
- 3. Manually screw the union nut as far as possible onto the pre-assembly mandrel. As soon as it has engaged the pipe, a clear increase in torque becomes noticeable. Using spanner, tighten union nut by c. 1 turn. **Note:** The pipe must not turn with the nut!

4. Check whether a visible collar has accumulated on the pipe in front of the (first) cutting edge.





10.2.2 Finished assembly in the threaded fitting mandrel

Insert pre-assembled pipe into the threaded fitting mandrel. Further tighten nut by c. ½ of a turn across the noticeable point of increased force, using a spanner to prevent any rotation of the mandrel. For threaded fittings with no pre-assembly the procedure is similar to that with preassembly mandrels. The union nut just needs tightening by c. 1.1/4 to 1.1/2 turns after the pressure point. **Note:** This type of screw connection is not recommended for the assembly of stainless steel components.

10.3 Assembling flared fittings

The pipe needs to be prepared in a similar way to that described at 6.1. On top of that comes the flaring, taking into account determining the pipe length.



Assembly is to be performed as follows:

- 1. First push nut, then pressure sleeve onto the side of the pipe to be flared.
- 2. Using an appropriate device, flare pipe. Pay attention to control Ø!
- Inner taper must be free of any grooves and clean. 3. Lightly oil tapered ring and press into the threaded
- fitting mandrel. Lubricate all moving parts with '325' grease.
- 4. Press the flared pipe joint onto the tapered ring and tighten the nut firmly by hand. Then further tighten by c. ½ turn using a spanner. Prevent threaded fitting mandrel from rotating.

Mathematical determination of pipe length for flared fittings

Without tapered ring measurement is taken from front of union

to front of union. Per pipe connection you must deduct measurement X!. Measurement L1 is the pipe length difference between flared fitting and cutting ring fitting.

Where a tapered ring has been pressed in, measurement is taken from front of tapered ring to front of tapered ring. Per pipe connection you must add measurement X2.

Pipe dimensions	x1	x2	11	Cont	rol Ø DK
Ra x s				min.	max.
6 x 1.0	1.0	3.5	8.0	9.1	10.0
6 x 1.5	2.0	2.5	9.0	9.1	10.0
8 x 1.0	1.0	4.0	8.0	11.3	12.0
8 x 1.5	2.0	3.0	9.0	11.3	12.0
8 x 2.0	2.5	2.5	9.5	11.3	12.0
10 x 1.0	1.0	4.5	8.0	13.1	14.0
10 x 1.5	2.0	3.5	9.0	13.1	14.0
10 x 2.0	3.0	2.5	10.0	13.1	14.0
12 x 1.0	1.0	4.5	8.0	15.3	16.0
12 x 1.5	2.0	3.5	9.0	15.3	16.0
12 x 2.0	3.0	2.5	10.0	15.3	16.0
6 x 1.0	1.0	3.5	8.0	9.1	10.0
14 x 1.5	0.5	5.5	8.5	18.6	19.6
14 x 2.0	1.0	5.0	9.0	18.6	19.6
14 x 2.5	2.0	4.0	10.0	18.6	19.6
14 x 3.0	3.0	3.0	11.0	18.6	19.6
15 x 1.5	1.0	4.5	8.0	19.1	20.0
15 x 2.0	2.0	3.5	9.0	19.1	20.0
15 x 2.5	3.0	2.5	10.0	19.1	20.0
16 x 1.5	0.0	6.5	8.5	20.6	22.0
16 x 2.0	1.0	5.5	9.5	20.6	22.0
16 x 2.5	1.5	5.0	10.0	20.6	22.0
16 x 3.0	2.5	4.0	11.0	20.6	22.0
18 x 1.5	0.0	5.5	7.5	23.2	24.0
18 x 2.0	1.0	4.5	8.5	23.2	24.0
18 x 2.5	1.5	4.0	9.0	23.2	24.0
20 x 2.0	1.0	7.0	11.5	25.6	26.8
20 x 2.5	2.0	6.0	12.5	25.6	26.8

10.4 Assembling welded taper joints

- 1. Having cut off pipe at right angles and deburred it, chamfer for V-joint (as per DIN 2559).
- 2. Push union nut onto the weld taper and carefully weld pipe together. Pay attention to ensure that weld taper and pipe are aligned.
- 3. Allow to cool and clean welds on both sides. Groove, taper and cone must also be clean.
- 4. Pull on O-ring
- 5. Lightly grease taper and cone with 'Gleitmo 810' lubricant.
- 6. Screw on union nut firmly by hand and after a noticeable increase in force further tighten by c.. $\frac{1}{4}$ to $\frac{1}{2}$ turn with a spanner.

10.5 Assembling conical hose fittings

- 1. Lightly oil thread and O-ring or grease with lubricant.
- 2. Where necessary for angled, T and L fittings align pipe joint in the desired direction.
- 3. Screw on sealing cone nut firmly by hand and further tighten by c.. 1/3 turn with a spanner.



- 10.6 Fitting instructions for removable pipe joints for metallic gas pipelines
- 1. Solderless threaded pipe joints with male connectors may not be used in installations that need to comply with DVGW-TRGI'86 / TRF'88!
- 2. DCGW approval mark: NG 4502AQ1441 NG - 4502AQ1441
 - DG 4502AQ1280 DG - 4502AQ1281
- 3. Suitable for gases as per DVGW worksheets G 260/I and G 260/II.
- 4. Permissible nominal pressures

Row	Pipe outer Ø	Nominal pressure PN
	mm	bar
L	6	250
	8	250
	10	250
	12	250
	18	160
	22	160
	35	100
S	6	250
	8	250
	10	250
	12	250
	14	250
	16	250
	20	250
	25	250
	30	250
	38	250

- Permitted operating temperature range of -20°C to +70°C.
- 6. Pipes compliant with ISO 1127, part 1.
- 7. Axial rigidity: resistant to pulling/pushing.
- 8. Repeat usability: 10 times.

Assembly instructions



When assembling stainless steel pipes pre-assembly must be done exclusively in the hardened pre-assembly mandrel. Any direct assembly in the stainless steel union must be avoided! The cones of the pre-assembly mandrel are subject to wear and a cone gauge must therefore be used at regular intervals to check that they remain true to gauge size. In order to avoid incorrect assembly from the outset, worn pre-assembly mandrels should be replaced with new ones.



We recommend only seamless, softly annealed stainless steel pipes made of material 1.4571 to DIN 2391, part 1 or DIN 2462, tolerance class D4 / T3. **Note:** No welded pipes! Saw the pipes off at right angles in a jig, saw off permitted angle deviation, ** query **, zuverlässige zur Rohrachse max 0,5°.

Do not use a pipe cutters!



Lightly deburr pipes inside and outside. Bevel of max. 0.2 x 45° is permissible. For thin-walled pipes we recommend using reinforcing sleeves (VSH). Clamp the relevant pre-assembly mandrel for the respective pipe into the bench vice.



Loosely screw the 24° inner cone and the outer thread of the pre-assembly mandrel, plus the whole inside of the union nut onto the pre-assembly mandrel so that the grease can spread itself about better within the thread.



Order details for ES grease 325

Tube 50 g: Grease 325 - 50 g Can 250g: Grease 325 - 250 g Can 1000g: Grease 325 - 1000g



Push union nut and cutting ring over the pipe end. **Note:** Cutting ring always in direction of the connecting cone.



Push combined unit of pipe, cutting ring and union nut into the pre-assembly mandrel.





A mark on the union nut makes it easier to monitor the required rotation. Screw union nut by hand onto the pre-assembly mandrel until you feel it make contact. At the same time push the pipe against the end stop in the bottom of the pre-assembly mandrel.

Using a spanner, tighten by c. $1 - 1\frac{1}{2}$ turns (varies depending on size). The pipe twists radially in the process by up to c. $\frac{1}{2}$ turn, but thereafter it should not turn with the nut.

Note: When pre-assembling double edge cutting rings, tighten as far as possible to the upper tightening limits (c. $1\frac{1}{4}$ - $1\frac{1}{2}$ turns).





Loosen union nut.

Check cutting edge's incisions on the pipe. The bulging covers a part of the face of the cutting ring equally across its full scope. The cutting ring is allowed to rotate radially, but it should not be possible to push it forwards. Due to the tough pipe material 1.4571 no bulging is created at the cutting edge of the kind seen with steel pipes.

Finished assembly in the union:



After approval, fit the pre-assembled pipe into the threaded fitting mandrel. Tighten the union nut by c. $\frac{1}{4}$ - $\frac{1}{2}$ turns, across the noticeable increase in force.

The union needs to be held by a spanner to stop it turning as well. When working with pipes of larger dimensions, extensions for the flat spanner are required/pipe extension).

Reinforcement sleeves



For reasons of cost thin-walled pipes are often used, which are unable to withstand the pressure of the cutting ring during assembly.

So that in spite of this you are able to ensure that the threaded joint functions well, we recommend using our reinforcement sleeves.

Assembly



The reinforcement sleeves can be easily inserted into the pipe up to the knurl.



The reinforcement cleave sits firmly in

Using a soft hammer, you knock the knurled part into the pipe. This creates a tight fit without widening the pipe.



The reinforcement sleeve sits firmly in place and supports the pipe against any contraction during the assembly process.

Use of reinforcement sleeves for stainless steel pipes e.g. material 1.4571/11.4541



O reinforcement sleeves not necessarily required.

O reinforcement sleeves required with frequent loosening and heavily used lines (vibrations).

einforcement sleeves indispensable.