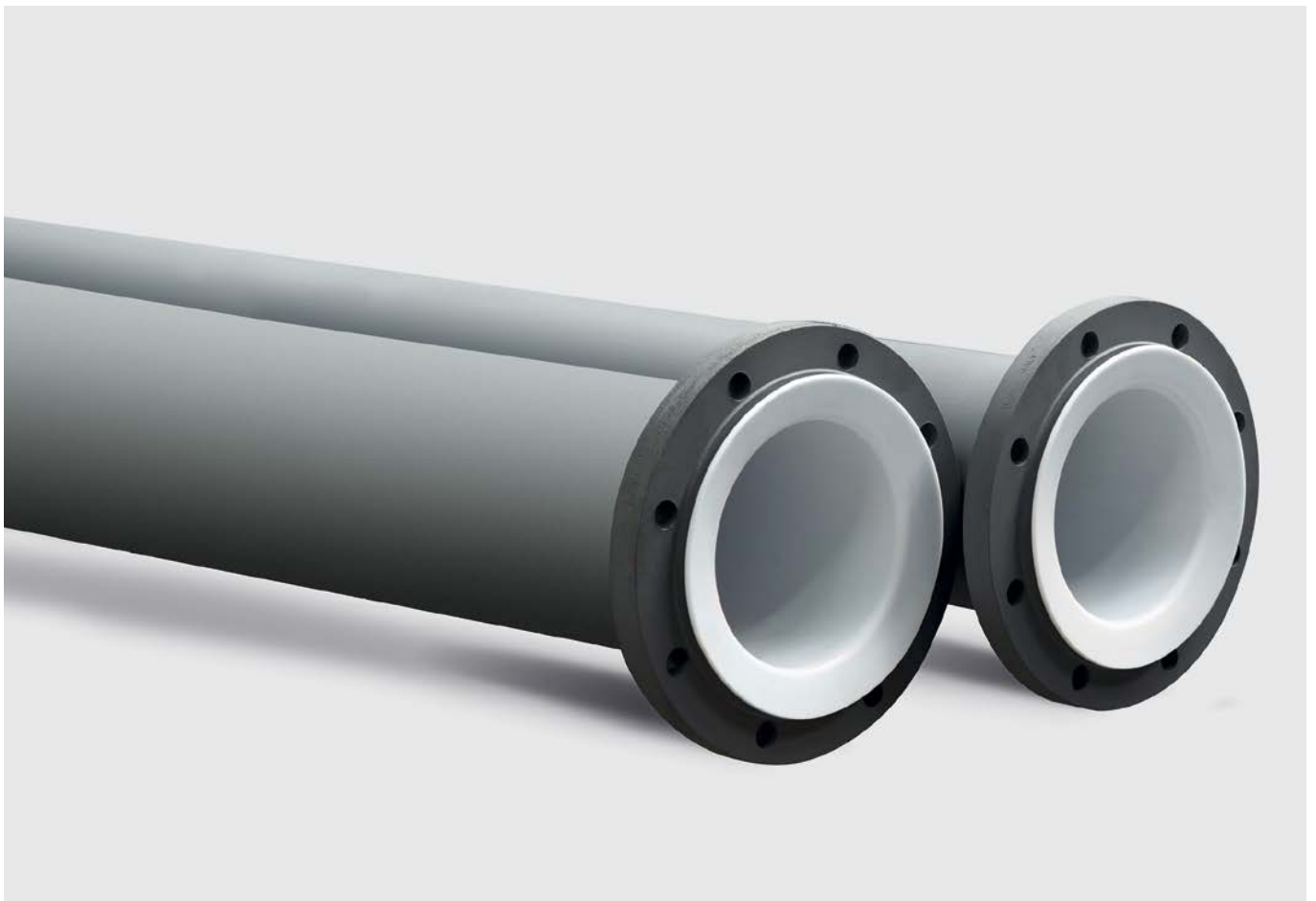




POLYFLURON® PTFE lined steel pipes and fittings ASME



Lined pipe classes

Based on over 60 years of experience with paste-extruded PTFE and more than 1000 reference customers, we supply a comprehensive range of POLYFLURON lined piping systems, mainly for the transport of corrosive media.

The following pages provide information on available products, dimensions and design options, as well as the materials used and permitted operating conditions.

This brochure deals exclusively with pipes & fittings up to a diameter of DN 600. Larger dimensions up to DN 3000 for columns and vessels are covered by a separate brochure, which is available on request.

We offer our lined piping products in two different liner thickness classes.

- **Standard**

Corrosion resistant and permeation reducing lining for aggressive media processed at moderate pressures and temperatures. This product series meets the standards of the chemical industry for paste extruded PTFE linings.

- **Heavy duty**

Suitable for long term operation with highly permeable media processed at high pressures and temperatures.

From our many years experience, we recommend the use of standardized pipe lengths. These reduce inventory costs and allow greater flexibility in assembly.

Our product range includes pipes of the following dimensions:

Nominal diameters: from 1 to 24 inch

Lengths: larger diameters available upon request
from 100 mm up to 6100 mm (20 ft.),
depending on the nominal diameter

Technical specifications

POLYFLURON PTFE is a virginal paste extruded PTFE exhibiting exceptional thermal, chemical, mechanical and electrical properties.

Exceptional properties

- Nearly universal chemical resistance and insolubility
- High operating temperatures up to 260 °C/500 °F
- Flexibility to - 79 °C
- High flexural fatigue resistance, nearly no material fatigue
- No aging by heat or UV radiation
- Exceptional electric insulator
- Very high purity (free of migrating additives or monomers), non-toxic
- Anti-adhesive surface, low coefficient of friction/wear, self-cleaning
- Excellent dimensional stability – no water absorption, no swelling
- Non-flammable

Pipes/Fittings

Material code

A 106 Gr. B

API 5L Gr. B

A 234 WPB

DIN EN 10213-2

Subject to technical changes.

The standards given below are ASME standards. If you require pipes and fittings according to DIN standards, please refer to our respective EN/DIN brochure.

Field of use

- Pressure load: 1 to 6 inch – up to 40 bar (PN 40);
8 to 24 inch – up to 25 bar (PN 25)
- Vacuum: Full vacuum [-1 barg] for all dimensions up to 4 inch and 150 °C. Vacuum-resistant versions for larger dimensions and higher temperatures on request.
- Lining: Virginal paste-extruded PTFE) meeting DIN 2874.
- Temperatures: - 10 ° up to + 230 °C;
lower service temperatures can be accommodated with the use of special steel materials.

Options

- Antistatic (electrically conductive) liner
- Stainless steel and low temperature steel
- Venting nozzles
- Grounding bolts and connections
- Custom shapes
- Special paint coatings

Stainless steel materials are available on request.

Flanges

Material code

A 105 (C21)

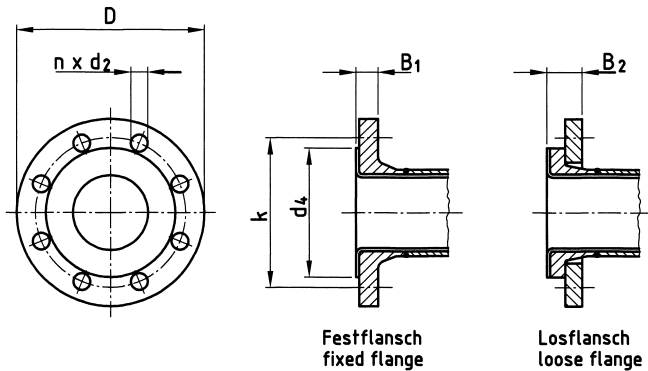
A 570 Gr. 36

A 515 Gr. 55

Subject to technical changes.

Pipe dimensions

The following table gives the standard wall thicknesses of steel pipes meeting ANSI B36.10.



Pipe dimensions

| DN | Steel pipe | DN | Steel pipe |
|------|---|------|---|
| [in] | Outside \varnothing x wall thickness [mm] | [in] | Outside \varnothing x wall thickness [mm] |
| 1" | 33.4 x 3.4 | 8" | 219.1 x 8.2 |
| 1 ¼" | 42.2 x 3.6 | 10" | 273 x 9.3 |
| 1 ½" | 48.3 x 3.7 | 12" | 323.9 x 9.5 |
| 2" | 60.3 x 3.9 | 14" | 355.6 x 9.5 |
| 2 ½" | 73 x 5.5 | 16" | 406.4 x 9.5 |
| 3" | 88.9 x 5.5 | 18" | 457.2 x 9.5 |
| 4" | 114.3 x 6 | 20" | 508 x 9.5 |
| 5" | 141.3 x 6.6 | 24" | 610 x 9.5 |
| 6" | 168.3 x 7.1 | | |

Subject to technical changes.

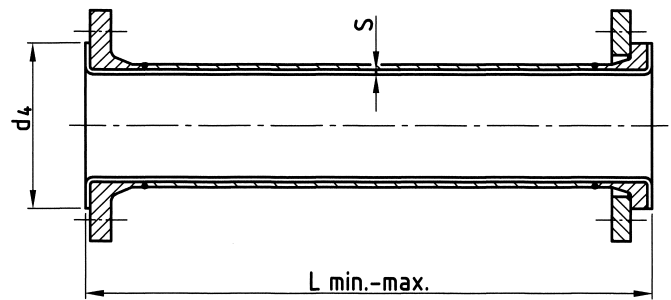
Flange dimensions

| DN | Flange \varnothing | Seal. surface | Bolt circle \varnothing | Bolt holes | Flange thickness incl. collar | |
|------|----------------------|---------------|---------------------------|--------------|-------------------------------|-----------------|
| [in] | D [mm] | d4 [mm] | k [mm] | n x [Number] | d2 [mm] | B1 [mm] B2 [mm] |
| 1" | 107.9 | 51 | 79.4 | 4 | 15.9 | 17 29 |
| 1 ¼" | 117.5 | 64 | 88.9 | 4 | 15.9 | 19 31 |
| 1 ½" | 127 | 73 | 98.4 | 4 | 15.9 | 21 33 |
| 2" | 152.4 | 92 | 120.6 | 4 | 19 | 22 36 |
| 2 ½" | 177.8 | 105 | 139.7 | 4 | 19 | 26 40 |
| 3" | 190.5 | 127 | 152.4 | 4 | 19 | 27 43 |
| 4" | 228.6 | 157 | 190.5 | 8 | 19 | 28 44 |
| 5" | 254 | 186 | 215.9 | 8 | 22.2 | 28 46 |
| 6" | 279.4 | 216 | 241.3 | 8 | 22.2 | 30 48 |
| 8" | 342.9 | 270 | 298.4 | 8 | 22.2 | 34 54 |
| 10" | 406.4 | 324 | 361.9 | 12 | 25.4 | 35 57 |
| 12" | 482.6 | 381 | 431.8 | 12 | 25.4 | 37 59 |
| 14" | 533.4 | 413 | 476.2 | 12 | 28.6 | 40 62 |
| 16" | 596.9 | 470 | 539.7 | 16 | 28.6 | 42 66 |
| 18" | 635 | 533 | 577.8 | 16 | 31.7 | 45 69 |
| 20" | 698.5 | 584 | 635 | 20 | 31.7 | 48 74 |
| 24" | 812.8 | 692 | 749.3 | 20 | 34.9 | 53 79 |

Subject to technical changes.

POLYFLURON® PTFE lined pipes

The standardized diameters and lengths of POLYFLURON PTFE lined steel pipes are given in ASME B 16.5 standard. We can supply all items listed in this standard. For larger diameters up to 120 inch [DN 3000], please refer to our separate brochure entitled "Columns and Vessels".



Lined pipes

| DN | L min | L max | Lining wall thickness | | PTFE Flange ϕ d4 [mm] | Weight fix/loose | |
|------|-------|-------|-----------------------|--------------------|----------------------------------|----------------------|----------------|
| | | | Standard [mm] | Heavy Duty [mm] | | Lined pipe [kg/m] | Flange [kg] |
| 1" | 100 | 6000 | 3 | | 51 | 3 | 2.1 |
| | 100 | 6000 | | 4 | 51 | | |
| 1 ¼" | 100 | 6000 | 3 | | 64 | 4 | 2.8 |
| | 100 | 6000 | | 4 | 64 | | |
| 1 ½" | 100 | 6000 | 3 | | 73 | 4.9 | 3.3 |
| | 100 | 6000 | | 4 | 73 | | |
| 2" | 100 | 6000 | 3 | | 92 | 6.5 | 5.3 |
| | 100 | 6000 | | 4 | 92 | | |
| 2 ½" | 100 | 6000 | 3.5 | | 105 | 10 | 7.8 |
| | 100 | 6000 | | 4 | 105 | | |
| 3" | 110 | 6000 | 3.5 | | 127 | 13 | 9.3 |
| | 110 | 6000 | | 4 | 127 | | |
| 4" | 110 | 6000 | 4.5 | | 157 | 19 | 14 |
| | 110 | 6000 | | 5 | 157 | | |
| 5" | 110 | 6000 | 4.5 | | 186 | 25 | 17 |
| | 110 | 6000 | | 6 | 186 | | |
| 6" | 120 | 6000 | 5 | | 216 | 33 | 21 |
| | 120 | 6000 | | 6 | 216 | | |
| 8" | 130 | 6000 | 5 | | 270 | 49 | 34 |
| | 130 | 6000 | | 8 | 270 | | |
| 10" | 130 | 4000 | 5 | | 324 | 68 | 47 |
| | 130 | 4000 | | 8 | 324 | | |
| 12" | 150 | 3500 | 5.5 | | 381 | 86 | 71 |
| | 150 | 3500 | | 8 | 381 | | |
| 14" | 150 | 3500 | 5.5 | | 413 | 94 | 92 |
| | 150 | 2500 | | 8 | 413 | | |
| 16" | 200 | 2500 | 5.5 | | 470 | 109 | 113 |
| | 200 | 2500 | | 8 | 470 | | |
| 18" | 200 | 2500 | 5.5 | | 533 | 121 | 128 |
| | 200 | 2500 | | 8 | 533 | | |
| 20" | 250 | 2500 | 6 | | 584 | 136 | 159 |
| | 250 | 2200 | | 8 | 584 | | |
| 24" | 250 | 1800 | 6 | | 692 | 165 | 218 |
| | 250 | 1600 | | 8 | 692 | | |

Subject to technical changes.

POLYFLURON® PTFE lined elbows

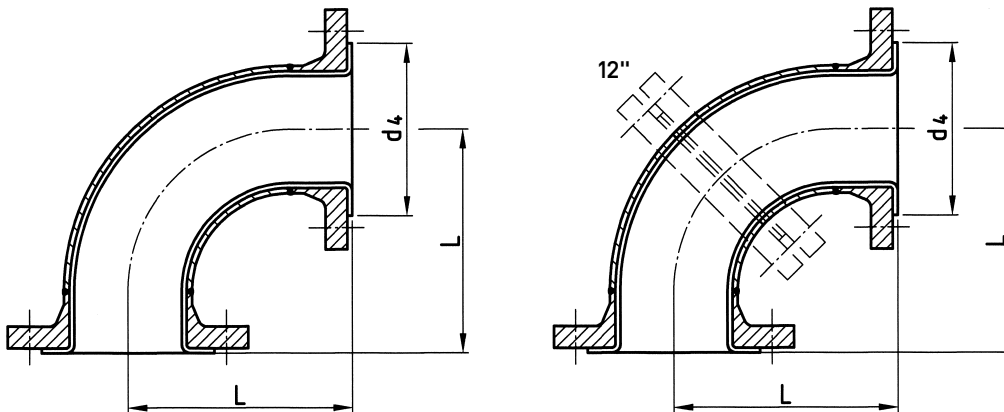
Elbows are manufactured with angles of 90°, 60°, 45° or 30°. Other angles are available on request. Please ask us for more information. 90° elbows are supplied with one fixed and one loose flange as standard. All 45° elbows come

with fixed flanges. Alternatives are available on request. Products up to 10 inch diam. are manufactured in one part. Items of 12 inch diam. or above come in two parts.

Lined elbows

| DN | L | | PTFE | PTFE | Weight | |
|------|-------------------|-------------------|-----------|------------|---------------------------|---------------------------|
| [in] | 90° elbow [mm] | 45° elbow [mm] | S [mm] | d4 [mm] | 90° elbow [approx. kg] | 45° elbow [approx. kg] |
| 1" | 89 | 51* | 3 | 51 | 2.5 | 2.4 |
| 1 ¼" | 95 | 51 | 3 | 64 | 3.3 | 3 |
| 1 ½" | 102 | 57 | 3 | 73 | 4.2 | 3.6 |
| 2" | 114 | 64 | 3 | 92 | 6.4 | 5.4 |
| 2 ½" | 127 | 76 | 3.5 | 105 | 8.8 | 7.9 |
| 3" | 140 | 76 | 3.5 | 127 | 12 | 10 |
| 4" | 165 | 102 | 4.5 | 157 | 17 | 15 |
| 5" | 190 | 114 | 4.5 | 186 | 22 | 19 |
| 6" | 203 | 127 | 5 | 216 | 31 | 22 |
| 8" | 229 | 140 | 5 | 270 | 44 | 35 |
| 10" | 279 | 165 | 5 | 324 | 65 | 61 |
| 12" | 483 | 190 | 5.5 | 381 | 175 | 90 |
| 14" | 546 | 190 | 5.5 | 413 | 239 | 99 |
| 16" | 610 | 203 | 5.5 | 470 | 275 | 116 |
| 20" | 737 | 241 | 6 | 584 | 448 | 167 |
| 24" | 864 | 279 | 6 | 692 | 625 | 234 |

* not included in ANSI B 16.5. Subject to technical changes.



POLYFLURON® PTFE and PFA lined tees and lined reducing tees

T-pieces up to 4 inch diam. are available with either of two different linings. The POLYFLURON PTFE lined variant is supplied with a high performance flange connection of well-proven design [see drawing A].

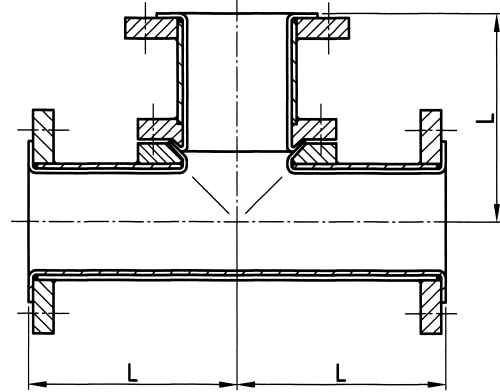
As an alternative, PFA-lined tees are available as shown on drawing B. PFA is a tetrafluorethylene-based copolymer with chemical and thermal properties comparable to those of PTFE. Fixed flanges are supplied as standard. Loose flanges are, however, also available on request.

Lined tees

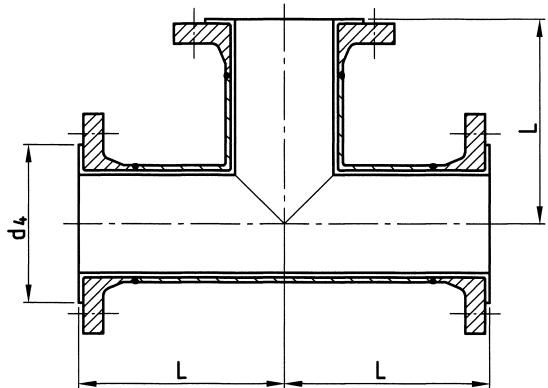
| DN | L | Weight | |
|------|------|----------------------|---------------------|
| | | PTFE [approx. kg] | PFA [approx. kg] |
| [in] | [mm] | | |
| 1" | 89 | | 5 |
| 1 ¼" | 95 | 7.5 | 6.5 |
| 1 ½" | 102 | 11 | 8.5 |
| 2" | 114 | 17 | 13 |
| 2 ½" | 127 | 18 | 17.5 |
| 3" | 140 | 26 | 28 |
| 4" | 165 | 40 | 47 |
| 5" | 190 | 45 | |
| 6" | 203 | 63 | |
| 8" | 229 | 107 | |
| 10" | 279 | 153 | |
| 12" | 305 | 215 | |
| 14" | 356 | 294 | |
| 16" | 381 | 360 | |
| 18" | 419 | 455 | |
| 20" | 457 | 570 | |

Subject to technical changes.

Steel pipe dimensions, lining wall thicknesses and flange diameters correspond to the standard dimensions.



↑ PTFE lined T-pieces (Drawing A)



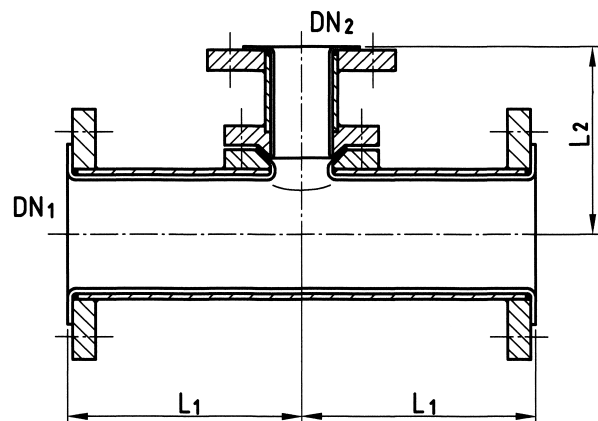
↑ PFA lined T-pieces (Drawing B)

Lined reducing tees

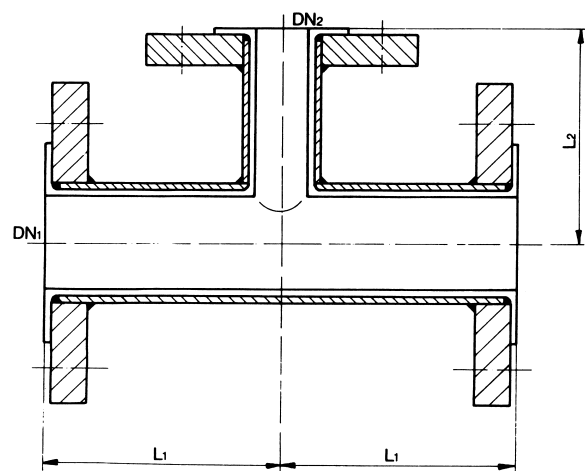
| DN 1 | DN 2 | L 1 | L 2 | Weight | |
|------|------|------|------|-----------------------------|----------------------------|
| | | | | PTFE lining [approx. kg] | PFA lining [approx. kg] |
| [in] | [in] | [mm] | [mm] | | |
| 1 ¼" | 1" | 95 | 95 | 5.3 | 4.2 |
| | 1" | 102 | 102 | 6.1 | 5.2 |
| 2" | 1 ½" | 114 | 114 | 9.7 | 8.7 |
| | 1" | 114 | 114 | 7.9 | 8.4 |
| 2 ½" | 2" | 127 | 127 | 15 | 10.5 |
| | 1 ½" | 127 | 127 | 14 | 9.5 |
| 3" | 2" | 140 | 140 | 18 | 19 |
| | 1 ½" | 140 | 140 | 16 | 18 |
| | 1" | 140 | 140 | 14 | 17 |
| 4" | 3" | 165 | 165 | 27 | 34 |
| | 2" | 165 | 165 | 23 | 31 |
| | 1" | 165 | 165 | 20 | 29 |
| 5" | 4" | 190 | 190 | 36 | |
| | 3" | 190 | 190 | 32 | |
| 6" | 4" | 203 | 203 | 43 | |
| | 3" | 203 | 203 | 39 | |
| 8" | 6" | 229 | 229 | 68 | |
| | 4" | 229 | 229 | 61 | |
| 10" | 8" | 279 | 279 | 105 | |
| | 6" | 279 | 279 | 94 | |
| 12" | 10" | 305 | 305 | 151 | |
| | 8" | 305 | 305 | 137 | |
| | 6" | 305 | 305 | 125 | |
| 14" | 12" | 356 | 356 | 201 | |
| | 10" | 356 | 356 | 184 | |
| | 8" | 356 | 356 | 171 | |
| 16" | 14" | 381 | 381 | 267 | |
| | 12" | 381 | 381 | 244 | |
| | 10" | 381 | 381 | 228 | |
| 18" | 16" | 419 | 419 | 310 | |
| | 14" | 419 | 419 | 287 | |
| | 12" | 419 | 419 | 263 | |
| 20" | 16" | 457 | 457 | 372 | |
| | 14" | 457 | 457 | 347 | |
| | 12" | 457 | 457 | 323 | |

Subject to technical changes.

All reducing tees are available with fixed flanges as standard. Loose flanges can also be supplied on request. PFA lined variants are also available up to 4 inch diam. Intermediate sizes and special dimensions are supplied on request. Dimensions meet ANSI B 16.5.



↑ PTFE lined reducing T-piece



↑ PFA lined reducing T-piece

POLYFLURON® PTFE and PFA lined crosses and lined reducing crosses

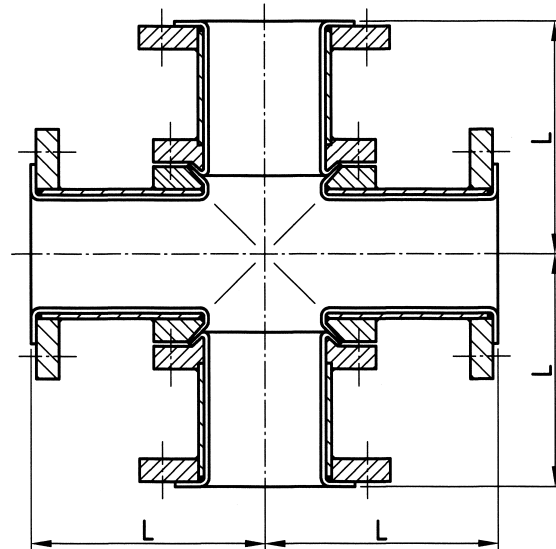
All crosses are available with fixed flanges as standard. Loose flanges can also be supplied on request. PFA lined variants are also available up to 4 inch diam. Dimensions meet ANSI B 16.5.

Lined crosses

| DN | L | Weight | |
|------|------|----------------------|---------------------|
| | | PTFE [approx. kg] | PFA [approx. kg] |
| [in] | [mm] | | |
| 1" | 89 | | 5 |
| 1 ¼" | 95 | 9 | 6.5 |
| 1 ½" | 102 | 12 | 8.5 |
| 2" | 114 | 18 | 13 |
| 2 ½" | 127 | 26 | 17.5 |
| 3" | 140 | 31 | 28 |
| 4" | 165 | 45 | 47 |
| 5" | 190 | 69 | |
| 6" | 203 | 71 | |
| 8" | 229 | 115 | |
| 10" | 279 | 171 | |
| 12" | 305 | 235 | |
| 14" | 356 | 322 | |
| 16" | 381 | 418 | |
| 18" | 419 | 460 | |
| 20" | 457 | 565 | |

Subject to technical changes.

Steel pipe dimensions, lining wall thicknesses and flange diameters correspond to the standard dimensions.



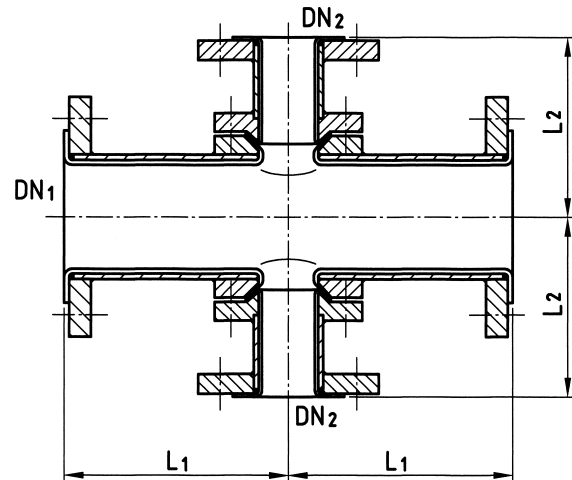
↑ PTFE lined cross

Lined reducing crosses

| DN 1 | DN 2 | L 1 | L 2 | Weight | |
|------|------|------|------|----------------------|---------------------|
| | | | | PTFE [approx. kg] | PFA [approx. kg] |
| [in] | [in] | [mm] | [mm] | [approx. kg] | [approx. kg] |
| 1 ¼" | 1" | 95 | 95 | 8.5 | 4.5 |
| 1 ½" | 1" | 102 | 102 | 9.3 | 5.2 |
| 2" | 1 ½" | 114 | 114 | 14 | 8.7 |
| 2 ½" | 1" | 114 | 114 | 11 | 8.4 |
| | 1 ½" | 127 | 127 | 18 | 12 |
| 3" | 1 ½" | 127 | 127 | 16 | 11 |
| | 2" | 140 | 140 | 22 | 19 |
| 4" | 1 ½" | 140 | 140 | 19 | 18 |
| | 1" | 140 | 140 | 16 | 17 |
| | 3" | 165 | 165 | 31 | 34 |
| 5" | 2" | 165 | 165 | 26 | 31 |
| | 1" | 165 | 165 | 22 | 29 |
| | 4" | 190 | 190 | 42 | |
| 6" | 3" | 190 | 190 | 33 | |
| | 4" | 203 | 203 | 49 | |
| 8" | 3" | 203 | 203 | 43 | |
| | 6" | 229 | 229 | 76 | |
| 10" | 4" | 229 | 229 | 62 | |
| | 8" | 279 | 279 | 165 | |
| 12" | 6" | 279 | 279 | 108 | |
| | 10" | 305 | 305 | 187 | |
| 14" | 8" | 305 | 305 | 165 | |
| | 6" | 305 | 305 | 142 | |
| | 12" | 356 | 356 | 259 | |
| 16" | 10" | 356 | 356 | 231 | |
| | 8" | 356 | 365 | 212 | |
| | 14" | 381 | 381 | 323 | |
| 18" | 12" | 381 | 381 | 288 | |
| | 10" | 381 | 381 | 261 | |
| | 16" | 419 | 419 | 415 | |
| 20" | 14" | 419 | 419 | 381 | |
| | 12" | 419 | 419 | 347 | |
| | 16" | 457 | 457 | 459 | |
| 20" | 14" | 457 | 457 | 417 | |
| | 12" | 457 | 457 | 355 | |

Subject to technical changes.

All crosses are available with fixed flanges as standard. Loose flanges can also be supplied on request. Dimensions meet ANSI B 16.5.



↑ PTFE lined reducing cross

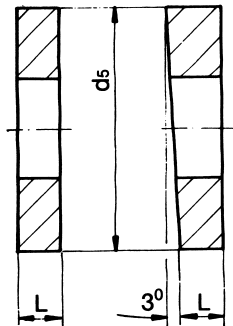
Steel pipe dimensions, lining wall thicknesses and flange diameters correspond to the standard dimensions.

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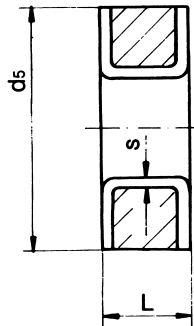
PTFE and PTFE lined spacers

Spacers are used to compensate for deviations in the assembly of pipe systems. Depending on their size, they can be manufactured either from massive PTFE or PTFE lined steel. The different designs are named Type F, G and H.

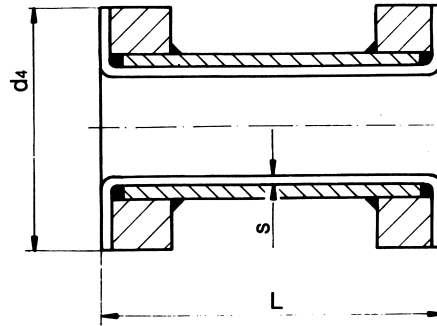
Their specific designs are shown in the illustrations below. Please refer to the table below and on the opposite page for dimensional details of the three spacer types. Nominal diameters of 1¼ inch, 2½ inch and 5 inch are also available.



↑ Type F1 (massive PTFE) Type F2



↑ Type G



↑ Type H

Lined spacers

| DN1 [in] | Length of | | | s [mm] | d4 [mm] | PTFE | Weight [approx. kg] |
|-------------|--------------------|----------------|----------------|-----------|------------|------------|------------------------|
| | Type F1/2* [mm] | Type G [mm] | Type H [mm] | | | d5 [mm] | |
| 1" | 10 | | | | | 63 | 0.1 |
| | | | 25 | | 3 | 63 | 0.5 |
| | | | 50 | | 3 | 63 | 1.2 |
| 1 ½" | 10 | | 75 | | 51 | 63 | 0.7 |
| | | | 25 | | 3 | 82 | 0.1 |
| | | | 50 | | 3 | 82 | 1 |
| 2" | 10 | | 75 | | 73 | 82 | 1.8 |
| | | | 25 | | 3 | 102 | 1.1 |
| | | | 50 | | 3 | 102 | 0.1 |
| 3" | 10 | | 75 | | 92 | 102 | 1.4 |
| | | | 25 | | 3 | 102 | 2.3 |
| | | | 50 | | 3 | 102 | 1.6 |
| 4" | 10 | | 75 | | | 133 | 0.2 |
| | | | 25 | | 3.5 | 133 | 2.1 |
| | | | 50 | | 3.5 | 133 | 3.6 |
| | | | 75 | | 3.5 | 127 | 2.8 |
| | | | 100 | | 3.5 | 127 | 3 |
| 5" | 10 | | 75 | | 157 | 172 | 0.2 |
| | | | 25 | | 4.5 | 172 | 2.5 |
| | | | 50 | | 4.5 | 172 | 5 |
| | | | 75 | | 4.5 | 157 | 3.5 |
| | | | 100 | | 4.5 | 157 | 3.8 |

* please state F1 or F2.

Subject to technical changes.

Lined spacers

| DN1 [in] | Length of | | | | s [mm] | d4 [mm] | PTFE d5 [mm] | Weight [approx. kg] | |
|-------------|--------------------|----------------|----------------|-----|-----------|------------|--------------------|------------------------|-----|
| | Type F1/2* [mm] | Type G [mm] | Type H [mm] | | | | | | |
| 6" | 10 | | | | | | 219 | 0.4 | |
| | | | 25 | | | 5 | | 219 | 3.9 |
| | | | 50 | | | 5 | | 219 | 7.2 |
| | | | | 75 | | 5 | 216 | | 6 |
| | | | | 100 | | 5 | 216 | | 6.5 |
| 8" | 10 | | | | | | 276 | 0.6 | |
| | | | 25 | | | 5 | | 276 | 5.3 |
| | | | 50 | | | 5 | | 276 | 11 |
| | | | | 75 | | 5 | 270 | | 15 |
| | | | | 100 | | 5 | 270 | | 9.8 |
| 10" | | 25 | | | 5 | | 337 | 7 | |
| | | 50 | | | 5 | | 337 | 13 | |
| | | 75 | | | 5 | | 337 | 18 | |
| | | | 100 | | 5 | 324 | | 13 | |
| 12" | | 25 | | | 5.5 | | 407 | 8.2 | |
| | | 50 | | | 5.5 | | 407 | 15 | |
| | | 75 | | | 5.5 | | 407 | 21 | |
| | | | 100 | | 5.5 | 381 | | 16 | |
| 14" | | 25 | | | 5.5 | | 447 | 14 | |
| | | 50 | | | 5.5 | | 447 | 28 | |
| | | 75 | | | 5.5 | | 447 | 42 | |
| | | | 100 | | 5.5 | 413 | | 22 | |
| 16" | | 25 | | | 5.5 | | 511 | 18 | |
| | | 50 | | | 5.5 | | 511 | 36 | |
| | | 75 | | | 5.5 | | 511 | 54 | |
| | | | 100 | | 5.5 | 470 | | 27 | |
| 18" | | 25 | | | 5.5 | | 546 | 19 | |
| | | 50 | | | 5.5 | | 546 | 39 | |
| | | 75 | | | 5.5 | | 546 | 59 | |
| | | | 100 | | 5.5 | 533 | | 34 | |
| 20" | | 25 | | | 6 | | 603 | 21 | |
| | | 50 | | | 6 | | 603 | 42 | |
| | | 75 | | | 6 | | 603 | 64 | |
| | | | 100 | | 6 | 584 | | 38 | |
| 24" | | 25 | | | 6 | | 714 | 21 | |
| | | 50 | | | 6 | | 714 | 40 | |
| | | 75 | | | 6 | | 714 | 65 | |

* please state F1 or F2.

Subject to technical changes.

POLYFLURON®

PTFE and PFA lined instrument tees

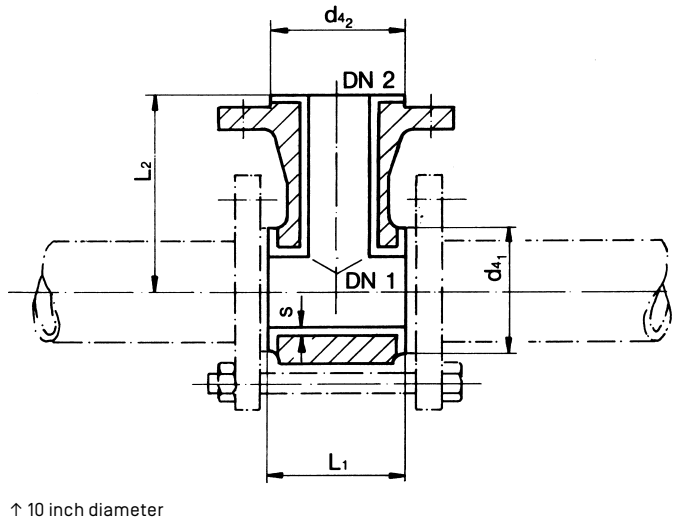
Instrument tees are used to connect manometers or thermometers, and also for sampling.

Instrument tees up to 10 inch diam. are supplied with a PFA lining. PFA is a tetrafluorethylene-based copolymer with chemical and thermal properties comparable to those of PTFE.

PFA lined instrument tees

| DN 1 | DN 2 | L 1 | L 2 | Weight |
|------|------|------|------|--------------|
| [in] | [in] | [mm] | [mm] | [approx. kg] |
| 1" | 1" | 50 | 89 | 1.9 |
| 1 ¼" | 1" | 50 | 95 | 2.8 |
| 1 ½" | 1 ½" | 75 | 102 | 4.4 |
| | 1" | 50 | 102 | 2.4 |
| 2" | 2" | 90 | 114 | 8.1 |
| | 1 ½" | 75 | 114 | 6.2 |
| | 1" | 50 | 114 | 3.2 |
| 2 ½" | 2" | 90 | 127 | 11 |
| | 1 ½" | 75 | 127 | 9 |
| | 1" | 50 | 127 | 5 |
| 3" | 2" | 90 | 140 | 14 |
| | 1 ½" | 75 | 140 | 8.3 |
| | 1" | 50 | 140 | 4.3 |
| 4" | 2" | 90 | 165 | 17.5 |
| | 1 ½" | 75 | 165 | 10 |
| | 1" | 50 | 165 | 5.5 |
| 5" | 2" | 90 | 190 | 22 |
| | 1 ½" | 75 | 190 | 14 |
| | 1" | 50 | 190 | 9 |
| 6" | 2" | 90 | 203 | 24 |
| | 1 ½" | 75 | 203 | 15 |
| | 1" | 50 | 203 | 7.7 |
| 8" | 2" | 90 | 229 | 26 |
| | 1 ½" | 75 | 229 | 18 |
| | 1" | 50 | 229 | 11 |
| 10" | 2" | 90 | 279 | 28 |
| | 1 ½" | 75 | 279 | 24 |
| | 1" | 50 | 279 | 15 |

Subject to technical changes.

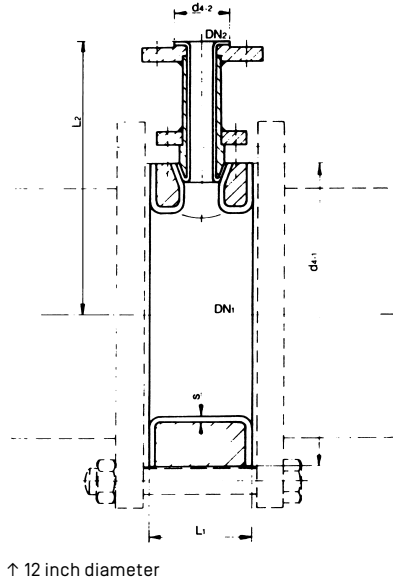


Products of 12 mm diam. or above are available in POLYFLURON PTFE lined steel (see table and drawings below).
 Dimensions meet ASME B 16.5.

PTFE lined instrument tees

| DN 1 | DN 2 | L 1 | L 2 | Weight |
|------|--------|------|------|--------------|
| [in] | [in] | [mm] | [mm] | [approx. kg] |
| 12 | 2" | 120 | 330 | 30 |
| | 1 1/2" | 105 | 330 | 29 |
| | 1" | 90 | 330 | 27 |
| 14 | 2" | 120 | 360 | 44 |
| | 1 1/2" | 105 | 360 | 43 |
| | 1" | 90 | 360 | 42 |
| 16 | 2" | 120 | 390 | 51 |
| | 1 1/2" | 105 | 390 | 49 |
| | 1" | 90 | 390 | 48 |
| 18 | 2" | 120 | 430 | 58 |
| | 1 1/2" | 105 | 430 | 57 |
| | 1" | 90 | 430 | 56 |
| 20 | 2" | 120 | 450 | 66 |
| | 1 1/2" | 105 | 450 | 65 |
| | 1" | 90 | 450 | 64 |

Subject to technical changes.



POLYFLURON® PTFE lined reducers and lined reducing flanges

Reducers are used to reduce/enlarge the pipe diameters in order to improve liquid flow. Eccentric reducers often

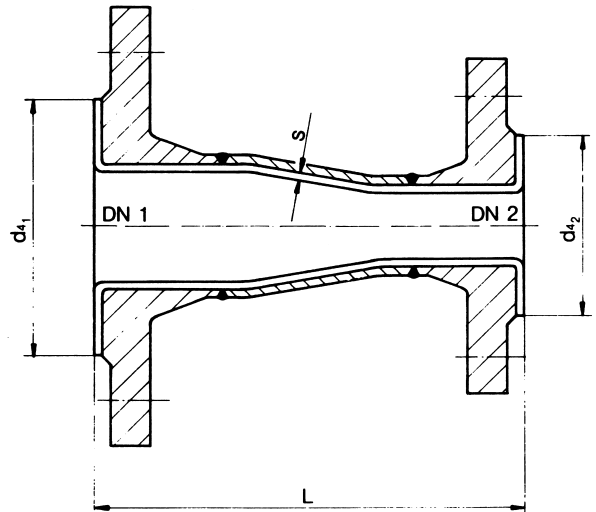
allow better emptying of pipe systems. Dimensions meet ANSI B 16.5.

Lined reducers

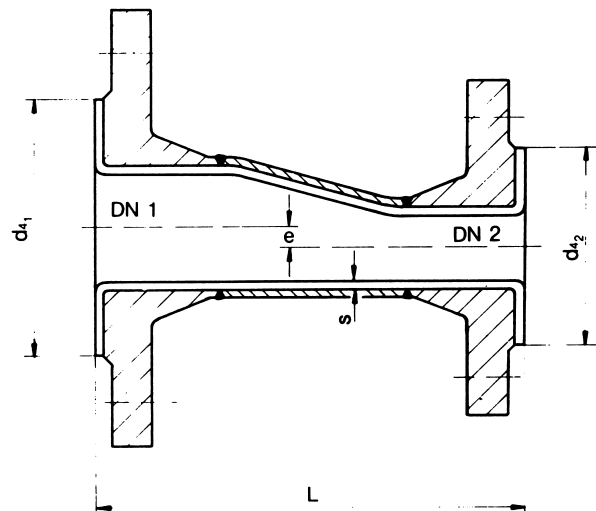
| DN 1 | DN 2 | L | Lining | Weight |
|------|------|------|----------------------|--------------|
| [in] | [in] | [mm] | ^s [mm] | [approx. kg] |
| 1" | ¾" | 114 | 3 | 2.4 |
| 1 ½" | 1" | 114 | 3 | 3.4 |
| 2" | 1" | 127 | 3* | 4.5 |
| | 1 ½" | 127 | 3 | 5.2 |
| 3" | 1" | 152 | 3.5* | 6.7 |
| | 1 ½" | 152 | 3.5* | 7.5 |
| | 2" | 152 | 3.5 | 6.9 |
| | 2 ½" | 152 | 4 | 7.5 |
| 4" | 2" | 178 | 4.5* | 9.9 |
| | 2 ½" | 178 | 4.5 | 10.6 |
| | 3" | 178 | 4.5 | 13 |
| 6" | 3" | 229 | 5* | 20 |
| | 4" | 229 | 5 | 22 |
| 8" | 4" | 279 | 5* | 31 |
| | 6" | 279 | 5 | 35 |
| 10" | 6" | 305 | 5 | 45 |
| | 8" | 305 | 5 | 52 |
| 12" | 6" | 356 | 5.5** | 62 |
| | 8" | 356 | 5.5 | 69 |
| | 10" | 356 | 5.5 | 76 |
| 14" | 8" | 406 | 5.5** | 70 |
| | 10" | 406 | 5.5** | 91 |
| | 12" | 406 | 5.5 | 105 |
| 16" | 10" | 457 | 5.5** | 98 |
| | 12" | 457 | 5.5** | 115 |
| | 14" | 457 | 5.5 | 125 |
| 18" | 12" | 483 | 5.5** | 135 |
| | 14" | 483 | 5.5** | 149 |
| | 16" | 483 | 5.5 | 160 |
| 20" | 14" | 508 | 5.5** | 168 |
| | 16" | 508 | 5.5** | 180 |
| | 18" | 508 | 5.5 | 190 |

* isostatic PTFE or PFA lining.

** two-part paste-extruded PTFE lining.
Subject to technical changes.



↑ Type K



↑ Type E

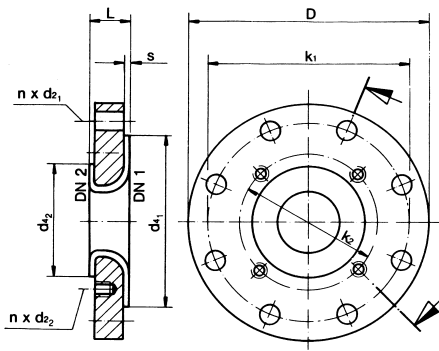
Single-part paste-extruded PTFE lining

Reducing flanges are provided with holes as shown below (smaller diameter flanges are always threaded):

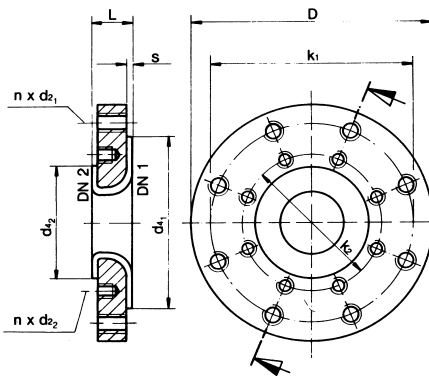
Type A: With clearance holes for larger nominal diameters
 Type B: With threaded holes for both nominal diameters

Type C: With threaded holes, holes on small diameter side are not straddled

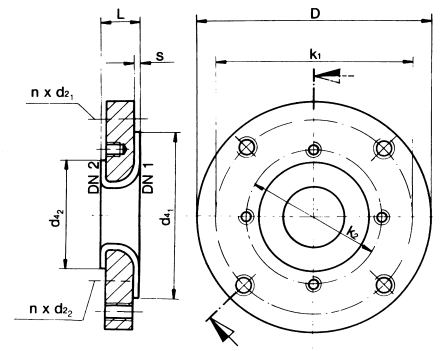
Connections to diameters of 1 1/4 inch, 2 1/2 inch and 5 inch, as well as larger dimensions and diameter combinations not stated here, can also be supplied on request.



↑ Type A



↑ Type B



↑ Type C

Lined reducing flanges

| DN1 | DN2 | L | PTFE | | | | | | Metal | | Weight [approx. kg] | Type |
|--------|--------|------|------|--------|--------|-------|-------|--------------|------------|--------------|---------------------|------|
| | | | s | d4 - 1 | d4 - 2 | D | k1 | k2 | n x d2 - 1 | n x d2 - 2 | | |
| [in] | [in] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| 1" | 3/4" | 25 | 3 | 51 | 43 | 108 | 79.4 | 4 x 1/2" UNC | 69.8 | 4 x 1/2" UNC | 1.5 | C |
| 1 1/2" | 1" | 25 | 3 | 73 | 51 | 127 | 98.4 | 4 x 1/2" UNC | 79.4 | 4 x 1/2" UNC | 1.9 | C |
| 2" | 1" | 25 | 3 | 92 | 51 | 152.4 | 120.6 | 4 x 5/8" UNC | 79.4 | 4 x 1/2" UNC | 2.9 | B |
| 2" | 1 1/2" | 25 | 3 | 92 | 73 | 152.4 | 120.6 | 4 x 5/8" UNC | 98.4 | 4 x 1/2" UNC | 2.7 | C |
| 3" | 1" | 30 | 4 | 127 | 51 | 190.5 | 152.4 | 4 x Ø 19 | 120.6 | 4 x 5/8" UNC | 5.5 | A |
| 3" | 1 1/2" | 30 | 4 | 127 | 73 | 190.5 | 152.4 | 4 x 5/8" UNC | 98.6 | 4 x 1/2" UNC | 5.3 | B |
| 3" | 2" | 30 | 4 | 127 | 92 | 190.5 | 152.4 | 4 x 5/8" UNC | 120.6 | 4 x 5/8" UNC | 5.2 | C |
| 4" | 1" | 30 | 3 | 157 | 51 | 228.6 | 190.5 | 8 x Ø 19 | 79.4 | 4 x 1/2" UNC | 8 | A |
| 4" | 1 1/2" | 30 | 4 | 157 | 73 | 228.6 | 190.5 | 8 x Ø 19 | 98.4 | 4 x 1/2" UNC | 7.8 | A |
| 4" | 2" | 30 | 4 | 157 | 92 | 228.6 | 190.5 | 8 x Ø 19 | 120.6 | 4 x 5/8" UNC | 7.6 | A |
| 4" | 3" | 30 | 5 | 157 | 127 | 228.6 | 190.5 | 8 x 5/8" UNC | 152.4 | 4 x 5/8" UNC | 6.6 | B |
| 6" | 1" | 35 | 3 | 216 | 51 | 279.4 | 241.3 | 8 x Ø 22.2 | 79.4 | 4 x 1/2" UNC | 12 | A |
| 6" | 1 1/2" | 35 | 4 | 216 | 73 | 279.4 | 241.3 | 8 x Ø 22.2 | 98.4 | 4 x 1/2" UNC | 13 | A |
| 6" | 2" | 35 | 4 | 216 | 92 | 279.4 | 241.3 | 8 x Ø 22.2 | 120.6 | 4 x 5/8" UNC | 13 | A |
| 6" | 3" | 35 | 5 | 216 | 127 | 279.4 | 241.3 | 8 x Ø 22.2 | 152.4 | 4 x 5/8" UNC | 12 | A |
| 6" | 4" | 35 | 5 | 216 | 157 | 279.4 | 241.3 | 8 x 3/4" UNC | 190.5 | 8 x 5/8" UNC | 11 | B |
| 8" | 2" | 35 | 4 | 270 | 92 | 342.9 | 298.4 | 8 x Ø 22.2 | 120.6 | 4 x 5/8" UNC | 19 | A |
| 8" | 3" | 35 | 5 | 270 | 127 | 342.9 | 298.4 | 8 x Ø 22.2 | 152.4 | 4 x 5/8" UNC | 18 | A |
| 8" | 4" | 35 | 5 | 270 | 157 | 342.9 | 298.4 | 8 x Ø 22.2 | 190.5 | 8 x 5/8" UNC | 17 | A |
| 8" | 6" | 35 | 5 | 270 | 216 | 342.9 | 298.4 | 8 x 3/4" UNC | 241.3 | 8 x 3/4" UNC | 15 | B |
| 10" | 2" | 35 | 5 | 324 | 92 | 406.4 | 361.9 | 12 x Ø 25.4 | 120.6 | 4 x 5/8" UNC | 27 | A |

Subject to technical changes.

Lined reducing flanges

| DN1 | DN 2 | L | PTFE | | | | | Metal | Weight | Type | | |
|------|------|------|------|--------|--------|-------|-------|---------------|--------|---------------|--------------|---|
| | | | s | d4 - 1 | d4 - 2 | D | k1 | | | | k2 | |
| [in] | [in] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | n x d2 - 1 | [mm] | n x d2 - 2 | [approx. kg] | |
| 10" | 3" | 35 | 5 | 324 | 127 | 406.4 | 361.9 | 12 x Ø 25.4 | 152.4 | 4 x 5/8" UNC | 26 | A |
| 10" | 4" | 35 | 5 | 324 | 157 | 406.4 | 361.9 | 12 x Ø 25.4 | 190.5 | 8 x 5/8" UNC | 25 | A |
| 10" | 6" | 35 | 5 | 324 | 216 | 406.4 | 361.9 | 12 x Ø 25.4 | 241.3 | 8 x 3/4" UNC | 23 | A |
| 10" | 8" | 35 | 5 | 324 | 270 | 406.4 | 361.9 | 12 x 7/8" UNC | 298.4 | 8 x 3/4" UNC | 20 | B |
| 12" | 2" | 40 | 5 | 381 | 92 | 482.6 | 431.8 | 12 x Ø 25.4 | 120.6 | 4 x 5/8" UNC | 46 | A |
| 12" | 3" | 40 | 5 | 381 | 127 | 482.6 | 431.8 | 12 x Ø 25.4 | 152.4 | 4 x 5/8" UNC | 45 | A |
| 12" | 4" | 40 | 5 | 381 | 157 | 482.6 | 431.8 | 12 x Ø 25.4 | 190.5 | 8 x 5/8" UNC | 44 | A |
| 12" | 6" | 40 | 5 | 381 | 216 | 482.6 | 431.8 | 12 x Ø 25.4 | 241.3 | 8 x 3/4" UNC | 41 | A |
| 12" | 8" | 40 | 5 | 381 | 270 | 482.6 | 431.8 | 12 x Ø 25.4 | 298.4 | 8 x 3/4" UNC | 38 | A |
| 12" | 10" | 40 | 5 | 381 | 324 | 482.6 | 431.8 | 12 x 7/8" UNC | 361.9 | 12 x 7/8" UNC | 33 | B |
| 14" | 4" | 40 | 5 | 413 | 157 | 533.4 | 476.2 | 12 x Ø 28.6 | 190.5 | 8 x 5/8" UNC | 54 | A |
| 14" | 6" | 40 | 5 | 413 | 216 | 533.4 | 476.2 | 12 x Ø 28.6 | 241.3 | 8 x 3/4" UNC | 51 | A |
| 14" | 8" | 40 | 5 | 413 | 270 | 533.4 | 476.2 | 12 x Ø 28.6 | 298.4 | 8 x 3/4" UNC | 48 | A |
| 14" | 10" | 40 | 5 | 413 | 324 | 533.4 | 476.2 | 12 x Ø 28.6 | 361.9 | 12 x 7/8" UNC | 43 | A |
| 14" | 12" | 40 | 5 | 413 | 381 | 533.4 | 476.2 | 12 x 1" UNC | 431.8 | 12 x 7/8" UNC | 37 | C |
| 16" | 6" | 45 | 5 | 470 | 216 | 596.9 | 539.7 | 16 x Ø 28.6 | 241.3 | 8 x 3/4" UNC | 72 | A |
| 16" | 8" | 45 | 5 | 470 | 270 | 596.9 | 539.7 | 16 x Ø 28.6 | 298.4 | 8 x 3/4" UNC | 68 | A |
| 16" | 10" | 45 | 5 | 470 | 324 | 596.9 | 539.7 | 16 x Ø 28.6 | 361.9 | 12 x 7/8" UNC | 63 | A |
| 16" | 12" | 45 | 5 | 470 | 381 | 596.9 | 539.7 | 16 x Ø 28.6 | 431.8 | 12 x 7/8" UNC | 57 | A |
| 16" | 14" | 45 | 5 | 470 | 413 | 596.9 | 539.7 | 16 x 1" UNC | 476.2 | 12 x 1" UNC | 52 | B |
| 18" | 8" | 45 | 5 | 533 | 270 | 635 | 577.8 | 16 x Ø 31.7 | 298.4 | 8 x 3/4" UNC | 80 | A |
| 18" | 10" | 45 | 5 | 533 | 324 | 635 | 577.8 | 16 x Ø 31.7 | 361.9 | 12 x 7/8" UNC | 74 | A |
| 18" | 12" | 45 | 5 | 533 | 381 | 635 | 577.8 | 16 x Ø 31.7 | 431.8 | 12 x 7/8" UNC | 68 | A |
| 18" | 14" | 45 | 5 | 533 | 413 | 635 | 577.8 | 16 x 1/8" 8UN | 476.2 | 12 x 1" UNC | 64 | B |
| 18" | 16" | 45 | 5 | 533 | 470 | 635 | 577.8 | 16 x 1/8" 8UN | 539.7 | 16 x 1" UNC | 56 | C |
| 20" | 10" | 45 | 5 | 584 | 324 | 698.5 | 635 | 20 x Ø 31.7 | 361.9 | 12 x 7/8" UNC | 93 | A |
| 20" | 12" | 45 | 5 | 584 | 381 | 698.5 | 635 | 20 x Ø 31.7 | 431.8 | 12 x 7/8" UNC | 87 | A |
| 20" | 14" | 45 | 5 | 584 | 413 | 698.5 | 635 | 20 x Ø 31.7 | 476.2 | 12 x 1" UNC | 83 | A |
| 20" | 16" | 45 | 5 | 584 | 470 | 698.5 | 635 | 20 x 1/8" 8UN | 539.7 | 16 x 1" UNC | 75 | B |
| 24" | 12" | 50 | 5 | 692 | 381 | 812.8 | 749.3 | 20 x Ø 35 | 431.8 | 12 x 7/8" UNC | 135 | A |
| 24" | 14" | 50 | 5 | 692 | 413 | 812.8 | 749.3 | 20 x Ø 35 | 476.2 | 12 x 1" UNC | 128 | A |
| 24" | 16" | 50 | 5 | 692 | 470 | 812.8 | 749.3 | 20 x Ø 35 | 539.7 | 16 x 1" UNC | 120 | A |
| 24" | 18" | 50 | 5 | 692 | 533 | 812.8 | 749.3 | 20 x Ø 35 | 577.8 | 16 x 1/8" 8NC | 110 | A |

Subject to technical changes.

POLYFLURON®

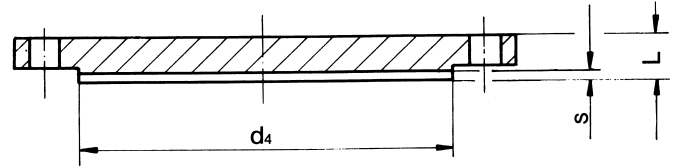
PTFE lined blind flanges

The POLYFLURON PTFE lining is fixed to the steel surface to prevent it from separating during transport and assembly. Sealing surfaces meet ANSI B16.5.

Lined blind flanges

| DN | L | PTFE | Weight |
|------|------|----------------------|--------------|
| [in] | [mm] | ^s [mm] | [approx. kg] |
| 1" | 17 | 3 | 0,9 |
| 1 ¼" | 19 | 3 | 1,3 |
| 1 ½" | 21 | 3 | 1,8 |
| 2" | 22 | 3 | 2,3 |
| 2 ½" | 25 | 3 | 3,2 |
| 3" | 27 | 3 | 4,1 |
| 4" | 27 | 3 | 7,7 |
| 5" | 28 | 4 | 9,2 |
| 6" | 29 | 4 | 12 |
| 8" | 33 | 4 | 21 |
| 10" | 35 | 5 | 32 |
| 12" | 37 | 5 | 51 |
| 14" | 40 | 5 | 65 |
| 16" | 42 | 5 | 83 |
| 18" | 45 | 5 | 95 |
| 20" | 48 | 5 | 102 |
| 24" | 53 | 5 | 132 |

Subject to technical changes.





Graphite Materials & Systems | SGL CARBON GmbH
Sales Europe/Middle East/Africa | pt-europe@sglcarbon.com
Sales Americas | pt-americas@sglcarbon.com
Sales Asia/Pacific | pt-asia@sglcarbon.com
www.sglprocesstechnology.com

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