

Bondstrand™ 2000M/7000M for Marine & Offshore

Product Data - 1 to 6 inch (Quick-lock™ joint), 8 to 40 inch (Taper/Taper joint) with external pressure requirements



Applications

- Ballast
- Sanitary service & sewage
- Chlorination
- Drain
- Portable discharge line
- Cargo line
- Stripper lines
- Tank cleaning (salt water)
- Fire protection mains
- Various other applications

Approvals

In 1993, IMO (International Maritime Organization) issued Resolution A.753 (18) covering acceptance criteria for the use of plastic pipe on ships. Major certifying bodies have adopted and implemented these Guidelines in their respective Rules and Regulations for the Classification of Ships.

All Bondstrand pipe series used in the marine industry are designed and type-approved by the below major certifying bodies. (A complete list is available, on request).

- American Bureau of Shipping (ABS), U.S.A.;
- Bureau Veritas, France;
- Det Norske Veritas, Norway;
- Germanischer Lloyd, Germany;
- Lloyd's Register, United Kingdom;
- Nippon Kaiji Kyokai, Japan;
- Registro Italiano Navale (RINA), Italy;
- United States Coast Guard (USCG), U.S.A.

Materials and Characteristics

Maximum operating temperature at design pressure: 93°C. However at lower operating pressures, the operating temperature of this application may be higher. (Consult NOV Fiber Glass Systems for clarifications).

- Pipe diameter: 1 - 40 inch (25-1000 mm).
- Pipe system design for pressure ratings up to: 17.2 bar (250 psi) for 1 - 16 inch and 16.0 bar (232 psi) for 18 - 40 inch, depending type of fittings, see contents for each fitting designated pressure rating.
- ASTM D-2992 Hydrostatic Design Basis (Procedure B - service factor 0.5);
- ASTM D-1599 Safety factor of 4:1. Design criteria for external pressure requirements are in accordance with IMO regulations.

Bondstrand 2000M

ASTM D-2310 Classification: RTRP-11FX for static hydrostatic design basis. Complies with ASTM F-1173 Classification and ASTM D-2996 designation.

Bondstrand 7000M

ASTM D-2310 Classification: RTRP-11AX for static hydrostatic design basis. Complies with ASTM F-1173 Classification and ASTM

Joining System

Quick-Lock™

1-6 inch (25-150 mm)

Straight/taper adhesive joint with integral pipe stop in bell end.

End configuration: Integral Quick-Lock bell end x shaved straight spigot.

Taper/Taper

8-40 inch (200-1000 mm)

Taper/Taper adhesive joint.

End configuration: Integral Taper bell x shaved taper spigot.

Fitting and Flanges

1-6 inch (25-150 mm)

Quick-Lock (straight/ taper) adhesive joint with integral pipe stop in bell end.

End configuration: Integral Quick-Lock bell ends.

8-40 inch (200-1000 mm)

Taper/Taper adhesive joint.

End configuration: Integral Taper bell end.

NOTE: Pipe nipples, saddles and flanged fittings have different end configurations.

Tolerance +/- 50 mm

Thermosetting adhesive for bonded

joints: Both Quick-Lock and Taper/Taper joints use PSX™-60 two-part epoxy adhesive.

View of Joint Illustrations



Quick-Lock



Taper/Taper

Pipe Series

Pipe

Filament-wound Glassfiber Reinforced Epoxy (GRE) pipe for Bondstrand adhesive-bonding systems.

Fittings

A wide range of lined filament-wound Glassfiber Reinforced Epoxy (GRE) fittings for Bondstrand adhesive-bonding systems. For special fittings, not listed in this product guide, please contact your NOV Fiber Glass Systems representative.

Flanges

Filament-wound Glassfiber Reinforced Epoxy (GRE) heavy-duty flanges and stub-end ring flanges for Taper/Taper and Quick-Lock adhesive bonding systems. Standard flange drilling patterns as per ANSI B16.5 (150 lb) for sizes 1" to 24" and ANSI B16.47, Series A (150 lb.) for sizes 26" to 40". Other flange drilling patterns, such as ANSI B16.5 (>150 lb.), DIN, ISO and JIS are also available.

Bondstrand 2000M

Glassfiber Reinforced Epoxy (GRE) pipe system. Standard 0.5 mm internal resin-rich reinforced liner.

- Maximum operating temperature: 93°C (for higher temperature rating, consult NOV Fiber Glass Systems).
- Maximum pressure rating: 17.2 bar (250 psi) for 1 - 16 inch, 16.0 bar (232 psi) for 18 - 40 inch.
- Minimum pressure: full vacuum.
- External Pressure Requirements: In accordance with IMO Regulations.

Bondstrand 7000M (*conductive)

Glassfiber Reinforced Epoxy (GRE) pipe system.

- Maximum operating temperature: 93°C (for higher temperature rating, consult NOV Fiber Glass Systems) with comingled carbon fibers.
- Maximum pressure rating: 17.2 bar (250 psi) for 1 - 16 inch, 16.0 bar (232 psi) for 18 - 40 inch.
- Minimum pressure: full vacuum.
- External Pressure Requirements: In accordance with IMO Regulations.

* **Conductive** - Our conductive pipe systems have been developed to prevent accumulation of potentially dangerous levels of static electrical charges. Pipe, fittings and flanges contain high strength conductive filaments. Together with a conductive adhesive this provides an electrically continuous system.

| Description | Bondstrand 2000M | Bondstrand 7000M |
|--------------------------------|---|---|
| Pipe Diameter | 1-40 inch (25-1000 mm) | 1-40 inch (25-1000 mm) |
| Joining System | Quick-Lock 1-6 inch Taper/Taper 8-40 inch | Quick-Lock 1-6 inch Taper/Taper 8-40 inch |
| Liner ⁽¹⁾ | 0.5 mm | - |
| Temperature ⁽²⁾ | 200°F (93°C) | 200°F (93°C) |
| Pressure Rating ⁽³⁾ | 17.2 bar (1-16 inch) 16.0 bar (18-40 inch) | 17.2 bar (1-16 inch) 16.0 bar (18-40 inch) |

⁽¹⁾ Available without an internal liner.

⁽²⁾ For temperature above 200°F (93°C), please consult NOV Fiber Glass Systems.

⁽³⁾ See fitting tables for specific pressure rating for individual fittings.

Pipe Length

| Nominal Pipe Size | | Joining System | Approximate Overall Length | |
|-------------------|-----------|----------------|----------------------------|-------|
| in | mm | | ft | m |
| 1 - 1½ | 25 - 40 | Quick-Lock | 10 | 3.0 |
| 2 - 6 | 50 - 150 | Quick-Lock | 30 | 9.0 |
| 8-10 | 200-250 | Taper/Taper | 40 | 11.89 |
| 12 - 16 | 300 - 400 | Taper/Taper | 40 | 11.89 |
| 18-40 | 450-1000 | Taper/Taper | 40 | 11.89 |

NOTE: Overall length varies from plant to plant. Consult NOV Fiber Glass Systems if exact overall length is required.

Dimensional Data - Bondstrand 2000M

| Nominal Pipe Size | | Inside Diameter | | Min. Structural Wall Thickness | | Pipe Weight | |
|-------------------|------|-----------------|--------|--------------------------------|------|-------------|-------|
| in | mm | in | mm | in | mm | lb/ft | kg/m |
| 1 | 25 | 1.1 | 27.1 | 0.1 | 3.0 | 0.5 | 0.7 |
| 1½ | 40 | 1.7 | 42.1 | 0.1 | 3.0 | 0.9 | 1.3 |
| 2 | 50 | 2.1 | 53.0 | 0.1 | 3.1 | 0.9 | 1.3 |
| 3 | 80 | 3.2 | 81.8 | 0.1 | 3.1 | 1.2 | 1.8 |
| 4 | 100 | 4.1 | 105.2 | 0.2 | 4.1 | 2.1 | 3.1 |
| 5 | 125 | 5.2 | 131.9 | 0.2 | 4.1 | 2.4 | 3.5 |
| 6 | 150 | 6.3 | 159.0 | 0.2 | 4.1 | 3.1 | 4.6 |
| 8 | 200 | 8.2 | 208.8 | 0.2 | 5.5 | 5.0 | 7.4 |
| 10 | 250 | 10.4 | 262.9 | 0.3 | 7.0 | 8.1 | 12.0 |
| 12 | 300 | 12.4 | 313.7 | 0.3 | 8.3 | 11.4 | 17.0 |
| 14 | 350 | 13.3 | 337.6 | 0.4 | 9.0 | 12.8 | 19.0 |
| 16 | 400 | 15.2 | 385.8 | 0.4 | 10.3 | 16.8 | 25.0 |
| 18 | 450 | 17.1 | 433.8 | 0.5 | 11.5 | 21.5 | 32.0 |
| 20 | 500 | 19.0 | 482.1 | 0.5 | 12.8 | 26.2 | 39.0 |
| 22 | 550 | 20.9 | 530.3 | 0.6 | 14.1 | 32.9 | 49.0 |
| 24 | 600 | 22.8 | 578.6 | 0.6 | 15.4 | 37.6 | 56.0 |
| 26 | 650 | 25.6 | 650.0 | 0.7 | 17.3 | 44.3 | 66.0 |
| 28 | 700 | 27.6 | 700.0 | 0.7 | 18.7 | 50.4 | 75.0 |
| 30 | 750 | 29.5 | 750.0 | 0.8 | 20.0 | 62.5 | 93.0 |
| 32 | 800 | 31.5 | 800.0 | 0.8 | 21.4 | 68.5 | 102.0 |
| 36 | 900 | 35.4 | 900.0 | 0.9 | 24.1 | 88.7 | 132.0 |
| 40 | 1000 | 39.4 | 1000.0 | 1.1 | 26.9 | 110.9 | 165.0 |

Dimensional Data - Bondstrand 7000M

| Nominal Pipe Size | | Inside Diameter | | Min. Structural Wall Thickness | | Pipe Weight | |
|-------------------|------|-----------------|--------|--------------------------------|------|-------------|-------|
| in | mm | in | mm | in | mm | lb/ft | kg/m |
| 1 | 25 | 1.1 | 27.1 | 0.1 | 3.5 | 0.5 | 0.7 |
| 1½ | 40 | 1.7 | 42.1 | 0.1 | 3.5 | 0.9 | 1.3 |
| 2 | 50 | 2.1 | 53.0 | 0.1 | 3.6 | 0.9 | 1.3 |
| 3 | 80 | 3.2 | 81.8 | 0.1 | 3.6 | 1.2 | 1.8 |
| 4 | 100 | 4.1 | 105.2 | 0.2 | 4.6 | 2.1 | 3.1 |
| 6 | 150 | 5.2 | 131.9 | 0.2 | 4.6 | 2.4 | 3.5 |
| 5 | 125 | 6.3 | 159.0 | 0.2 | 4.6 | 3.1 | 4.6 |
| 8 | 200 | 8.2 | 208.8 | 0.2 | 5.5 | 5.0 | 7.4 |
| 10 | 250 | 10.4 | 262.9 | 0.3 | 7.0 | 8.1 | 12.0 |
| 12 | 300 | 12.4 | 313.7 | 0.3 | 8.3 | 11.4 | 17.0 |
| 14 | 350 | 13.3 | 337.6 | 0.4 | 9.0 | 12.8 | 19.0 |
| 16 | 400 | 15.2 | 385.8 | 0.4 | 10.3 | 16.8 | 25.0 |
| 18 | 450 | 17.1 | 433.8 | 0.5 | 11.5 | 21.5 | 32.0 |
| 20 | 500 | 19.0 | 482.1 | 0.5 | 12.8 | 26.2 | 39.0 |
| 22 | 550 | 20.9 | 530.3 | 0.6 | 14.1 | 32.9 | 49.0 |
| 24 | 600 | 22.8 | 578.6 | 0.6 | 15.4 | 37.6 | 56.0 |
| 26 | 650 | 25.6 | 650.0 | 0.7 | 17.3 | 44.3 | 66.0 |
| 28 | 700 | 27.6 | 700.0 | 0.7 | 18.7 | 50.4 | 75.0 |
| 30 | 750 | 29.5 | 750.0 | 0.8 | 20.0 | 62.5 | 93.0 |
| 32 | 800 | 31.5 | 800.0 | 0.8 | 21.4 | 68.5 | 102.0 |
| 36 | 900 | 35.4 | 900.0 | 0.9 | 24.1 | 88.7 | 132.0 |
| 40 | 1000 | 39.4 | 1000.0 | 1.1 | 26.9 | 110.9 | 165.0 |

Ultimate Collapse Pressure*

| Nominal Pipe Size | | Internal Pressure Static ⁽¹⁾ | | 2000M | | 7000M | |
|-------------------|------|---|------|---------|-------|---------|-------|
| in | mm | psi | bar | psi | bar | psi | bar |
| 1 | 25 | 249.5 | 17.2 | 10181.7 | 702.0 | 10761.8 | 742.0 |
| 1½ | 40 | 249.5 | 17.2 | 2770.2 | 191.0 | 2871.8 | 198.0 |
| 2 | 50 | 249.5 | 17.2 | 1522.9 | 105.0 | 1566.4 | 108.0 |
| 3 | 80 | 249.5 | 17.2 | 423.5 | 29.2 | 430.8 | 29.7 |
| 4 | 100 | 249.5 | 17.2 | 462.7 | 31.9 | 469.9 | 32.4 |
| 5 | 125 | 249.5 | 17.2 | 235.0 | 16.2 | 237.9 | 16.4 |
| 6 | 150 | 249.5 | 17.2 | 134.9 | 9.3 | 136.3 | 9.4 |
| 8 | 200 | 249.5 | 17.2 | 143.6 | 9.9 | 143.6 | 9.9 |
| 10 | 250 | 249.5 | 17.2 | 147.9 | 10.2 | 147.9 | 10.2 |
| 12 | 300 | 249.5 | 17.2 | 146.5 | 10.1 | 146.5 | 10.1 |
| 14 | 350 | 249.5 | 17.2 | 149.4 | 10.3 | 149.4 | 10.3 |
| 16 | 400 | 249.5 | 17.2 | 149.4 | 10.3 | 149.4 | 10.3 |
| 18 | 450 | 232.1 | 16.0 | 146.5 | 10.1 | 146.5 | 10.1 |
| 20 | 500 | 232.1 | 16.0 | 147.9 | 10.2 | 147.9 | 10.2 |
| 22 | 550 | 232.1 | 16.0 | 147.9 | 10.2 | 147.9 | 10.2 |
| 24 | 600 | 232.1 | 16.0 | 149.4 | 10.3 | 149.4 | 10.3 |
| 26 | 650 | 232.1 | 16.0 | 149.4 | 10.3 | 149.4 | 10.3 |
| 28 | 700 | 232.1 | 16.0 | 150.8 | 10.4 | 150.8 | 10.4 |
| 30 | 750 | 232.1 | 16.0 | 149.4 | 10.3 | 149.4 | 10.3 |
| 32 | 800 | 232.1 | 16.0 | 150.8 | 10.4 | 150.8 | 10.4 |
| 36 | 900 | 232.1 | 16.0 | 150.8 | 10.4 | 150.8 | 10.5 |
| 40 | 1000 | 232.1 | 16.0 | 153.7 | 10.6 | 153.7 | 10.6 |

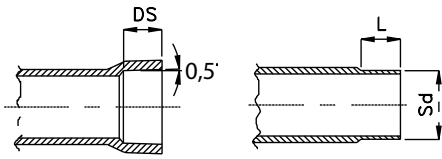
***NOTE:** Ultimate short-term external failure pressure at 150°F (65°C)

⁽¹⁾ Up to 200°F (93°C).

Quick-Lock Dimensions

Dimensions for Quick-Lock bell & spigot adhesive bonded joints

| Nominal Pipe Size | | Insertion Depth (Ds) | | Spigot Diameter (Sd) | | | | Spigot Length (L) | | | |
|-------------------|-----|----------------------|------|----------------------|-------|---------|-------|-------------------|------|---------|------|
| | | | | minimum | | maximum | | maximum | | minimum | |
| in | mm | in | mm | in | mm | in | mm | in | mm | in | mm |
| 1 | 25 | 1.1 | 27.0 | 1.3 | 32.6 | 1.3 | 32.9 | 1.1 | 28.5 | 1.2 | 31.0 |
| 1½ | 40 | 1.3 | 32.0 | 1.9 | 47.5 | 1.9 | 47.8 | 1.3 | 33.5 | 1.4 | 36.0 |
| 2 | 50 | 1.8 | 46.0 | 2.3 | 59.2 | 2.3 | 59.6 | 1.9 | 49.0 | 2.0 | 52.0 |
| 3 | 80 | 1.8 | 46.0 | 3.4 | 87.6 | 3.5 | 88.0 | 1.9 | 49.0 | 2.0 | 52.0 |
| 4 | 100 | 1.8 | 46.0 | 4.4 | 112.5 | 4.4 | 112.9 | 1.9 | 49.0 | 2.0 | 52.0 |
| 5 | 125 | 2.2 | 57.0 | 5.5 | 139.5 | 5.5 | 139.9 | 2.3 | 58.5 | 2.4 | 61.5 |
| 6 | 150 | 2.2 | 57.0 | 6.5 | 166.2 | 6.6 | 166.6 | 2.3 | 59.0 | 2.4 | 62.0 |

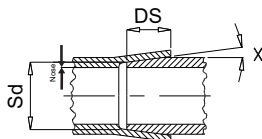


Taper/Taper Dimensions*

Tapered spigot dimensions for adhesive bonded Taper/Taper joints

| Nominal Pipe Size | | Taper Angle | Insertion Depth | | Nominal Spigot Nose Thickness | | Diameter of Spigot at Nose | |
|-------------------|------|-------------|-----------------|-----|-------------------------------|-----|----------------------------|--------|
| | | | X | Ds | Sd | Sd | | |
| in | mm | Degree | in | mm | in | mm | in | mm |
| 8 | 200 | 2.5 | 2.6 | 65 | 0.1 | 3.1 | 8.5 | 215.0 |
| 10 | 250 | 2.5 | 3.1 | 80 | 0.2 | 4.1 | 10.7 | 271.0 |
| 12 | 300 | 2.5 | 3.7 | 95 | 0.2 | 4.7 | 12.7 | 323.0 |
| 14 | 350 | 2.5 | 3.9 | 100 | 0.2 | 5.2 | 13.7 | 348.0 |
| 16 | 400 | 2.5 | 4.3 | 110 | 0.2 | 6.1 | 15.7 | 398.0 |
| 18 | 450 | 2.5 | 4.5 | 114 | 0.2 | 4.6 | 17.4 | 443.0 |
| 20 | 500 | 2.5 | 5.0 | 127 | 0.2 | 5.0 | 19.4 | 492.2 |
| 22 | 550 | 2.5 | 6.0 | 152 | 0.2 | 4.5 | 21.2 | 539.3 |
| 24 | 600 | 3.5 | 7.0 | 178 | 0.1 | 3.8 | 23.1 | 586.3 |
| 26 | 650 | 2.5 | 7.0 | 178 | 0.2 | 5.8 | 26.1 | 661.6 |
| 28 | 700 | 1.8 | 7.0 | 178 | 0.3 | 6.4 | 28.1 | 712.9 |
| 30 | 750 | 1.8 | 7.0 | 178 | 0.2 | 4.2 | 29.9 | 758.4 |
| 32 | 800 | 1.8 | 7.0 | 178 | 0.4 | 8.9 | 32.2 | 817.8 |
| 36 | 900 | 1.8 | 8.0 | 203 | 0.2 | 5.6 | 35.9 | 911.3 |
| 40 | 1000 | 1.8 | 12.6 | 320 | 0.3 | 8.1 | 40.0 | 1016.3 |

*Bondstrand 7000M



Span Length

Bondstrand 2000M

| Nominal Pipe Size | | Single Span ⁽¹⁾ | | Continuous Span ⁽¹⁾ | |
|-------------------|------|----------------------------|------|--------------------------------|------|
| | | ft | m | ft | m |
| in | mm | ft | m | ft | m |
| 1 | 25 | 8.5 | 2.6 | 10.8 | 3.3 |
| 1½ | 40 | 9.5 | 2.9 | 12.1 | 3.7 |
| 2 | 50 | 10.2 | 3.1 | 13.1 | 4.0 |
| 3 | 80 | 11.5 | 3.5 | 14.8 | 4.5 |
| 4 | 100 | 13.1 | 4.0 | 16.7 | 5.1 |
| 5 | 125 | 14.1 | 4.3 | 17.7 | 5.4 |
| 6 | 150 | 14.8 | 4.5 | 18.7 | 5.7 |
| 8 | 200 | 16.7 | 5.1 | 21.3 | 6.5 |
| 10 | 250 | 19.0 | 5.8 | 23.9 | 7.3 |
| 12 | 300 | 20.7 | 6.3 | 26.2 | 8.0 |
| 14 | 350 | 21.3 | 6.5 | 27.2 | 8.3 |
| 16 | 400 | 23.0 | 7.0 | 28.9 | 8.8 |
| 18 | 450 | 24.3 | 7.4 | 30.5 | 9.3 |
| 20 | 500 | 25.3 | 7.7 | 32.2 | 9.8 |
| 24 | 600 | 27.9 | 8.5 | 35.4 | 10.8 |
| 28 | 700 | 30.5 | 9.3 | 38.7 | 11.8 |
| 30 | 750 | 31.5 | 9.6 | 40.0 | 12.2 |
| 32 | 800 | 32.8 | 10.0 | 41.7 | 12.7 |
| 36 | 900 | 34.4 | 10.5 | 44.0 | 13.4 |
| 40 | 1000 | 36.4 | 11.1 | 46.3 | 14.1 |

Bondstrand 7000M

| Nominal Pipe Size | | Single Span ⁽¹⁾ | | Continuous Span ⁽¹⁾ | |
|-------------------|------|----------------------------|------|--------------------------------|------|
| | | ft | m | ft | m |
| in | mm | ft | m | ft | m |
| 1 | 25 | 8.5 | 2.6 | 10.8 | 3.3 |
| 1½ | 40 | 9.5 | 2.9 | 12.5 | 3.8 |
| 2 | 50 | 10.2 | 3.1 | 13.5 | 4.1 |
| 3 | 80 | 11.5 | 3.5 | 14.8 | 4.5 |
| 4 | 100 | 13.1 | 4.0 | 17.1 | 5.2 |
| 5 | 125 | 14.1 | 4.3 | 18.4 | 5.6 |
| 6 | 150 | 14.8 | 4.5 | 19.4 | 5.9 |
| 8 | 200 | 16.4 | 5.0 | 21.3 | 6.5 |
| 10 | 250 | 18.7 | 5.7 | 23.9 | 7.3 |
| 12 | 300 | 20.3 | 6.2 | 26.2 | 8.0 |
| 14 | 350 | 21.0 | 6.4 | 27.2 | 8.3 |
| 16 | 400 | 22.6 | 6.9 | 28.9 | 8.8 |
| 18 | 450 | 23.9 | 7.3 | 30.5 | 9.3 |
| 20 | 500 | 25.3 | 7.7 | 32.2 | 9.8 |
| 24 | 600 | 27.6 | 8.4 | 35.4 | 10.8 |
| 28 | 700 | 30.5 | 9.3 | 38.7 | 11.8 |
| 30 | 750 | 31.5 | 9.6 | 40.0 | 12.2 |
| 32 | 800 | 32.5 | 9.9 | 41.7 | 12.7 |
| 36 | 900 | 34.4 | 10.5 | 44.0 | 13.4 |
| 40 | 1000 | 36.4 | 11.1 | 46.3 | 14.1 |

⁽¹⁾ Span recommendations are based on pipes filled with water having a density of 1000 kg/m³. No provisions for the weight of valves, flanges or other heavy objects were considered in the calculations.

NOTE: ISO 14692 recommends a maximum support span length of 6.0 m

Elbows 90°

Filament-wound 90° elbows with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding

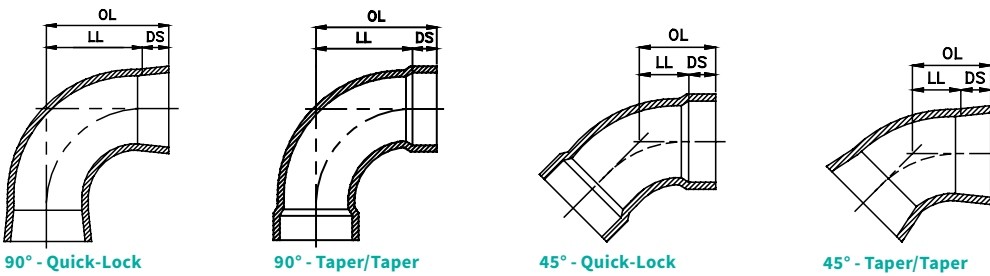
| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Maximum Working Pressure | | Average Weight | |
|-------------------|------|--------------------|--------|---------------------|--------|--------------------------|------|----------------|-------|
| in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1 | 25 | 2.6 | 65.0 | 3.6 | 92.0 | 249.5 | 17.2 | 0.7 | 0.3 |
| 1½ | 40 | 3.2 | 81.0 | 4.4 | 113.0 | 249.5 | 17.2 | 0.9 | 0.4 |
| 2 | 50 | 3.0 | 76.0 | 4.8 | 122.0 | 249.5 | 17.2 | 1.1 | 0.5 |
| 3 | 80 | 4.5 | 114.0 | 6.3 | 160.0 | 249.5 | 17.2 | 2.4 | 1.1 |
| 4 | 100 | 6.0 | 152.0 | 7.8 | 198.0 | 249.5 | 17.2 | 3.5 | 1.6 |
| 5 | 125 | 7.7 | 195.0 | 9.9 | 252.0 | 249.5 | 17.2 | 5.9 | 2.7 |
| 6 | 150 | 9.0 | 229.0 | 11.3 | 286.0 | 249.5 | 17.2 | 7.9 | 3.6 |
| 8 | 200 | 12.4 | 315.0 | 15.0 | 380.0 | 249.5 | 17.2 | 15.0 | 6.8 |
| 10 | 250 | 15.4 | 391.0 | 18.5 | 471.0 | 249.5 | 17.2 | 24.2 | 11.0 |
| 12 | 300 | 18.6 | 472.0 | 22.3 | 567.0 | 249.5 | 17.2 | 39.6 | 18.0 |
| 14 | 350 | 14.3 | 364.0 | 18.3 | 464.0 | 249.5 | 17.2 | 57.3 | 26.0 |
| 16 | 400 | 15.8 | 402.0 | 20.2 | 512.0 | 249.5 | 17.2 | 68.3 | 31.0 |
| 18 | 450 | 18.0 | 458.0 | 22.5 | 572.0 | 232.1 | 16.0 | 116.7 | 53.0 |
| 20 | 500 | 20.0 | 508.0 | 25.0 | 635.0 | 232.1 | 16.0 | 143.2 | 65.0 |
| 22 | 550 | 22.0 | 559.0 | 28.0 | 711.0 | 232.1 | 16.0 | 207.0 | 94.0 |
| 24 | 600 | 23.0 | 584.0 | 30.0 | 762.0 | 232.1 | 16.0 | 268.7 | 122.0 |
| 26 | 650 | 26.0 | 660.0 | 33.0 | 838.0 | 232.1 | 16.0 | 396.5 | 180.0 |
| 28 | 700 | 28.0 | 711.0 | 35.0 | 889.0 | 232.1 | 16.0 | 451.5 | 205.0 |
| 30 | 750 | 30.0 | 762.0 | 37.0 | 940.0 | 232.1 | 16.0 | 535.2 | 243.0 |
| 32 | 800 | 32.0 | 813.0 | 39.0 | 991.0 | 232.1 | 16.0 | 726.9 | 330.0 |
| 36 | 900 | 36.0 | 915.0 | 44.0 | 1118.0 | 232.1 | 16.0 | 918.5 | 417.0 |
| 40 | 1000 | 41.9 | 1065.0 | 54.5 | 1385.0 | 232.1 | 16.0 | 1077.1 | 489.0 |

Elbows 45°

Filament-wound 45° Quick-Lock (1-6 inch) and Taper/Taper (8-40 inch) socket ends for adhesive bonding

| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Maximum Working Pressure | | Average Weight | |
|-------------------|------|--------------------|-------|---------------------|-------|--------------------------|------|----------------|-------|
| in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1 | 25 | 0.9 | 22.0 | 1.9 | 49.0 | 249.5 | 17.2 | 0.4 | 0.2 |
| 1½ | 40 | 1.1 | 29.0 | 2.4 | 61.0 | 249.5 | 17.2 | 0.7 | 0.3 |
| 2 | 50 | 1.4 | 35.0 | 3.2 | 81.0 | 249.5 | 17.2 | 0.9 | 0.4 |
| 3 | 80 | 2.0 | 51.0 | 3.8 | 97.0 | 249.5 | 17.2 | 1.8 | 0.8 |
| 4 | 100 | 2.5 | 64.0 | 4.3 | 110.0 | 249.5 | 17.2 | 2.4 | 1.1 |
| 5 | 125 | 3.3 | 84.0 | 5.6 | 141.0 | 249.5 | 17.2 | 4.0 | 1.8 |
| 6 | 150 | 3.7 | 95.0 | 6.0 | 152.0 | 249.5 | 17.2 | 5.3 | 2.4 |
| 8 | 200 | 5.4 | 137.0 | 8.0 | 202.0 | 249.5 | 17.2 | 9.5 | 4.3 |
| 10 | 250 | 6.7 | 169.0 | 9.8 | 249.0 | 249.5 | 17.2 | 16.1 | 7.3 |
| 12 | 300 | 8.1 | 205.0 | 11.8 | 300.0 | 249.5 | 17.2 | 24.2 | 11.0 |
| 14 | 350 | 4.9 | 125.0 | 8.9 | 225.0 | 249.5 | 17.2 | 37.4 | 17.0 |
| 16 | 400 | 5.6 | 142.0 | 9.9 | 252.0 | 249.5 | 17.2 | 44.1 | 20.0 |
| 18 | 450 | 7.5 | 191.0 | 12.0 | 305.0 | 232.1 | 16.0 | 72.7 | 33.0 |
| 20 | 500 | 8.3 | 210.0 | 13.3 | 337.0 | 232.1 | 16.0 | 88.1 | 40.0 |
| 22 | 550 | 9.1 | 232.0 | 15.2 | 384.0 | 232.1 | 16.0 | 138.8 | 63.0 |
| 24 | 600 | 9.9 | 252.0 | 16.9 | 430.0 | 232.1 | 16.0 | 180.6 | 82.0 |
| 26 | 650 | 10.8 | 274.0 | 17.8 | 452.0 | 232.0 | 16.0 | 273.1 | 124.0 |
| 28 | 700 | 11.6 | 295.0 | 18.6 | 473.0 | 232.1 | 16.0 | 308.4 | 140.0 |
| 30 | 750 | 12.7 | 322.0 | 19.7 | 500.0 | 232.1 | 16.0 | 361.2 | 164.0 |
| 32 | 800 | 13.3 | 337.0 | 20.3 | 515.0 | 232.1 | 16.0 | 493.4 | 224.0 |
| 36 | 900 | 15.7 | 400.0 | 23.7 | 603.0 | 232.1 | 16.0 | 623.3 | 283.0 |
| 40 | 1000 | 18.7 | 475.0 | 31.4 | 798.0 | 232.1 | 16.0 | 735.7 | 334.0 |

View of Fitting Illustrations



Elbows 22½°

Filament-wound 22½° elbows with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding

| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Maximum Working Pressure | | Average Weight | |
|-------------------|-----|--------------------|------|---------------------|-------|--------------------------|------|----------------|------|
| in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1 | 25 | 0.4 | 9.0 | 1.4 | 36.0 | 249.5 | 17.2 | 0.2 | 0.1 |
| 1½ | 40 | 0.4 | 9.0 | 1.6 | 41.0 | 249.5 | 17.2 | 0.4 | 0.2 |
| 2 | 50 | 0.5 | 13.0 | 2.3 | 59.0 | 249.5 | 17.2 | 1.1 | 0.5 |
| 3 | 80 | 0.8 | 21.0 | 2.6 | 67.0 | 249.5 | 17.2 | 1.5 | 0.7 |
| 4 | 100 | 1.1 | 29.0 | 3.0 | 75.0 | 249.5 | 17.2 | 2.2 | 1.0 |
| 5 | 125 | 1.7 | 43.0 | 3.9 | 100.0 | 249.5 | 17.2 | 3.1 | 1.4 |
| 6 | 150 | 1.7 | 43.0 | 3.9 | 100.0 | 249.5 | 17.2 | 4.2 | 1.9 |
| 8 | 200 | 3.0 | 76.0 | 5.6 | 141.0 | 249.5 | 17.2 | 8.6 | 3.9 |
| 10 | 250 | 2.7 | 68.0 | 5.8 | 148.0 | 249.5 | 17.2 | 13.0 | 5.9 |
| 12 | 300 | 3.4 | 86.0 | 7.1 | 181.0 | 249.5 | 17.2 | 22.9 | 10.4 |
| 14 | 350 | 2.8 | 71.0 | 6.7 | 171.0 | 249.5 | 17.2 | 26.4 | 12.0 |

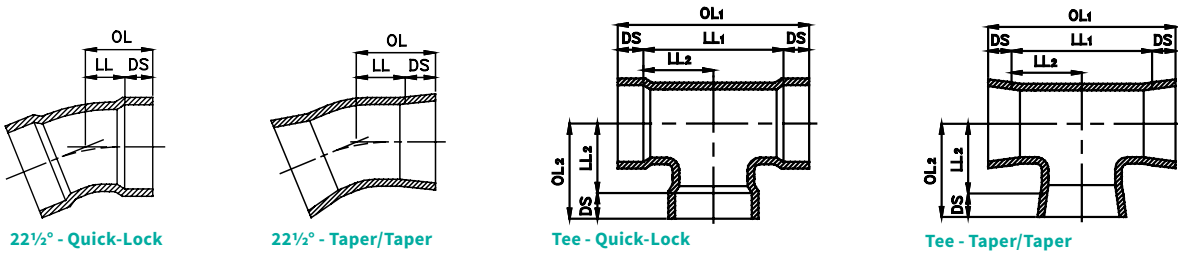
| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Maximum Working Pressure | | Average Weight | |
|-------------------|------|--------------------|-------|---------------------|-------|--------------------------|------|----------------|-------|
| in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 16 | 400 | 3.3 | 85.0 | 7.7 | 195.0 | 249.5 | 17.2 | 30.8 | 14.0 |
| 18 | 450 | 4.3 | 110.0 | 8.8 | 224.0 | 232.1 | 16.0 | 50.7 | 23.0 |
| 20 | 500 | 4.0 | 101.0 | 9.0 | 228.0 | 232.1 | 16.0 | 61.7 | 28.0 |
| 22 | 550 | 4.5 | 113.0 | 10.4 | 265.0 | 232.0 | 16.0 | 94.7 | 43.0 |
| 24 | 600 | 4.8 | 122.0 | 11.8 | 300.0 | 232.1 | 16.0 | 125.6 | 57.0 |
| 26 | 650 | 5.2 | 132.0 | 12.2 | 310.0 | 232.1 | 16.0 | 191.6 | 87.0 |
| 28 | 700 | 5.6 | 142.0 | 12.6 | 320.0 | 232.1 | 16.0 | 215.9 | 98.0 |
| 30 | 750 | 6.0 | 152.0 | 13.0 | 330.0 | 232.1 | 16.0 | 253.3 | 115.0 |
| 36 | 900 | 7.2 | 182.0 | 15.2 | 385.0 | 232.1 | 16.0 | 436.1 | 198.0 |
| 40 | 1000 | 10.2 | 258.0 | 22.8 | 578.0 | 232.1 | 16.0 | 515.4 | 234.0 |

Equal Tees

Filament-wound equal Tee Quick-Lock (1-6 inch) and Taper/Taper (8-40 inch) socket ends for adhesive bonding

| Nominal Pipe Size | | Laying Length Total Run (LL1) | | Overall Length Total Run (OL1) | | Laying Length Branch (LL2) | | Overall Length Branch (OL2) | | Maximum Working Pressure | | Average Weight | |
|-------------------|------|-------------------------------|--------|--------------------------------|--------|----------------------------|-------|-----------------------------|--------|--------------------------|------|----------------|-------|
| in | mm | in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1 | 25 | 2.1 | 54.0 | 4.3 | 108.0 | 1.1 | 27.0 | 2.1 | 54.0 | 249.5 | 17.2 | 0.4 | 0.2 |
| 1½ | 40 | 2.4 | 60.0 | 4.9 | 124.0 | 1.2 | 30.0 | 2.4 | 62.0 | 249.5 | 17.2 | 0.9 | 0.4 |
| 2 | 50 | 5.0 | 128.0 | 8.7 | 220.0 | 2.5 | 64.0 | 4.3 | 110.0 | 249.5 | 17.2 | 2.2 | 1.0 |
| 3 | 80 | 6.8 | 172.0 | 10.4 | 264.0 | 3.4 | 86.0 | 5.2 | 132.0 | 249.5 | 17.2 | 4.0 | 1.8 |
| 4 | 100 | 8.3 | 210.0 | 11.9 | 302.0 | 4.1 | 105.0 | 5.9 | 151.0 | 249.5 | 17.2 | 5.5 | 2.5 |
| 5 | 125 | 10.0 | 254.0 | 14.5 | 368.0 | 5.0 | 127.0 | 7.2 | 184.0 | 249.5 | 17.2 | 11.0 | 5.0 |
| 6 | 150 | 11.3 | 286.0 | 15.7 | 400.0 | 5.6 | 143.0 | 7.9 | 200.0 | 249.5 | 17.2 | 14.8 | 6.7 |
| 8 | 200 | 14.8 | 376.0 | 19.9 | 506.0 | 7.4 | 188.0 | 10.0 | 253.0 | 249.5 | 17.2 | 22.0 | 10.0 |
| 10 | 250 | 17.8 | 452.0 | 24.1 | 612.0 | 8.9 | 226.0 | 12.0 | 306.0 | 249.5 | 17.2 | 39.6 | 18.0 |
| 12 | 300 | 21.5 | 546.0 | 29.0 | 736.0 | 10.7 | 273.0 | 14.5 | 368.0 | 249.5 | 17.2 | 63.9 | 29.0 |
| 14 | 350 | 21.4 | 544.0 | 29.3 | 744.0 | 10.7 | 272.0 | 14.6 | 372.0 | 249.5 | 17.2 | 81.5 | 37.0 |
| 16 | 400 | 23.2 | 590.0 | 31.9 | 810.0 | 11.6 | 295.0 | 15.9 | 405.0 | 249.5 | 17.2 | 123.3 | 56.0 |
| 18 | 450 | 25.5 | 648.0 | 34.5 | 876.0 | 12.8 | 324.0 | 17.2 | 438.0 | 232.1 | 16.0 | 152.0 | 69.0 |
| 20 | 500 | 28.0 | 712.0 | 38.0 | 966.0 | 14.0 | 356.0 | 19.0 | 483.0 | 232.1 | 16.0 | 202.6 | 92.0 |
| 22 | 550 | 30.6 | 776.0 | 42.5 | 1080.0 | 13.3 | 338.0 | 21.3 | 540.0 | 232.1 | 16.0 | 286.3 | 130.0 |
| 24 | 600 | 33.0 | 838.0 | 47.0 | 1194.0 | 16.5 | 419.0 | 23.5 | 597.0 | 232.1 | 16.0 | 370.0 | 168.0 |
| 26 | 650 | 34.9 | 886.0 | 48.9 | 1242.0 | 17.4 | 443.0 | 24.5 | 621.0 | 232.1 | 16.0 | 500.0 | 227.0 |
| 28 | 700 | 38.0 | 964.0 | 52.0 | 1320.0 | 19.0 | 482.0 | 26.0 | 660.0 | 232.1 | 16.0 | 627.8 | 285.0 |
| 30 | 750 | 40.0 | 1016.0 | 54.0 | 1372.0 | 20.0 | 508.0 | 27.0 | 686.0 | 232.1 | 16.0 | 742.3 | 337.0 |
| 32 | 800 | 42.9 | 1090.0 | 56.9 | 1446.0 | 21.5 | 545.0 | 28.5 | 723.0 | 232.1 | 16.0 | 1011.0 | 459.0 |
| 36 | 900 | 48.0 | 1220.0 | 64.0 | 1626.0 | 24.0 | 610.0 | 32.0 | 813.0 | 232.1 | 16.0 | 1279.7 | 581.0 |
| 40 | 1000 | 57.7 | 1466.0 | 82.9 | 2106.0 | 28.9 | 733.0 | 41.5 | 1053.0 | 232.1 | 16.0 | 1511.0 | 686.0 |

View of Fitting Illustrations



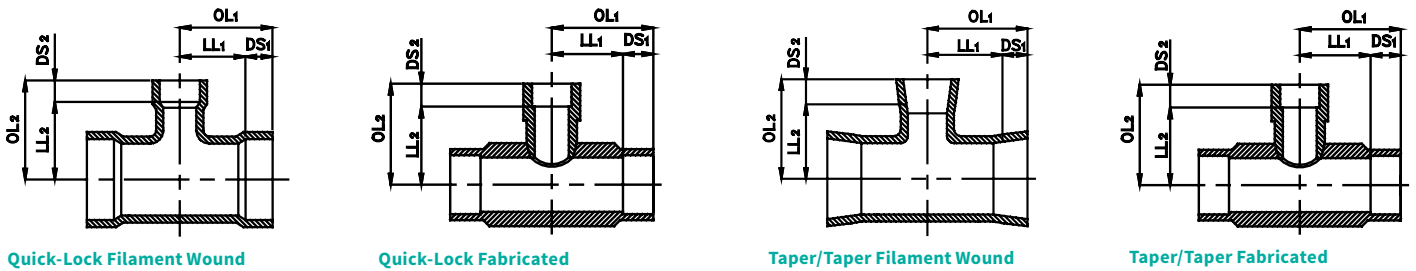
Reducing Tees

Filament-wound standard and fabricated reducing tees with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding

| Nominal Pipe Size | | Laying Length Total Run (LL1) | | Overall Length Total Run (OL1) | | Laying Length Branch (LL2) | | Overall Length Branch (OL2) | | Maximum Working Pressure | | Average Weight | |
|-------------------|---------------|-------------------------------|------------|--------------------------------|------------|----------------------------|------------|-----------------------------|------------|--------------------------|-------------|----------------|-------------|
| in | mm | in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1.5x1 | 40x25 | 1.2 | 30 | 2.4 | 62 | 1.2 | 30 | 2.2 | 57 | 249.5 | 17.2 | 1.3 | 0.6 |
| 2x1 | 50x25 | 2.5 | 64 | 4.3 | 110 | 2.2 | 57 | 3.3 | 84 | 249.5 | 17.2 | 2.0 | 0.9 |
| 2x1.5 | 50x40 | 2.5 | 64 | 4.3 | 110 | 2.2 | 57 | 3.5 | 89 | 249.5 | 17.2 | 2.2 | 1.0 |
| 3x1 | 80x25 | 3.4 | 86 | 5.2 | 132 | 3.0 | 76 | 4.1 | 103 | 249.5 | 17.2 | 3.5 | 1.6 |
| 3x1.5 | 80x40 | 3.4 | 86 | 5.2 | 132 | 3.0 | 76 | 4.3 | 108 | 249.5 | 17.2 | 3.5 | 1.6 |
| 3x2 | 80x50 | 3.4 | 86 | 5.2 | 132 | 3.0 | 76 | 4.8 | 122 | 249.5 | 17.2 | 3.7 | 1.7 |
| 4x1 | 100x25 | 2.8 | 72 | 4.6 | 118 | 7.6 | 194 | 8.7 | 221 | 249.5 | 17.2 | 16.5 | 7.5 |
| 4x1.5 | 100x40 | 3.5 | 89 | 5.4 | 136 | 7.6 | 194 | 8.9 | 226 | 249.5 | 17.2 | 19.8 | 9.0 |
| 4x2 | 100x50 | 4.1 | 105 | 5.9 | 151 | 3.5 | 89 | 5.3 | 135 | 249.5 | 17.2 | 4.6 | 2.1 |
| 4x3 | 100x80 | 4.1 | 105 | 5.9 | 151 | 3.9 | 98 | 5.7 | 144 | 249.5 | 17.2 | 5.1 | 2.3 |
| 5x2 | 125x50 | 5.0 | 127 | 7.2 | 184 | 4.0 | 102 | 5.8 | 148 | 249.5 | 17.2 | 7.5 | 3.4 |
| 5x3 | 125x80 | 5.0 | 127 | 7.2 | 184 | 4.4 | 111 | 6.2 | 157 | 249.5 | 17.2 | 8.8 | 4.0 |
| 5x4 | 125x100 | 5.0 | 127 | 7.2 | 184 | 4.6 | 118 | 6.5 | 164 | 249.5 | 17.2 | 10.1 | 4.6 |
| 6x1 | 150x25 | 3.3 | 83 | 5.5 | 140 | 8.7 | 221 | 9.8 | 248 | 249.5 | 17.2 | 25.8 | 11.7 |
| 6x1.5 | 150x40 | 4.0 | 101 | 6.2 | 158 | 8.7 | 221 | 10.0 | 253 | 249.5 | 17.2 | 30.4 | 13.8 |
| 6x2 | 150x50 | 5.6 | 143 | 7.9 | 200 | 4.5 | 114 | 6.3 | 160 | 249.5 | 17.2 | 13.7 | 6.2 |
| 6x3 | 150x80 | 5.6 | 143 | 7.9 | 200 | 4.9 | 124 | 6.7 | 170 | 249.5 | 17.2 | 12.6 | 5.7 |
| 6x4 | 150x100 | 5.6 | 143 | 7.9 | 200 | 5.1 | 130 | 6.9 | 176 | 249.5 | 17.2 | 13.0 | 5.9 |
| 6x5 | 150x125 | 5.6 | 143 | 7.9 | 200 | 5.4 | 136 | 7.6 | 193 | 249.5 | 17.2 | 13.7 | 6.2 |
| 8x1 | 200x25 | 3.5 | 88 | 6.0 | 153 | 9.6 | 245 | 10.7 | 272 | 249.5 | 17.2 | 33.0 | 15.0 |
| 8x1.5 | 200x40 | 3.5 | 88 | 6.0 | 153 | 9.7 | 246 | 10.9 | 278 | 249.5 | 17.2 | 38.5 | 17.5 |
| 8x2 | 200x50 | 3.5 | 88 | 6.0 | 153 | 9.6 | 245 | 11.5 | 291 | 249.5 | 17.2 | 43.8 | 19.9 |
| 8x3 | 200x80 | 7.4 | 188 | 10.0 | 253 | 5.9 | 149 | 7.7 | 195 | 249.5 | 17.2 | 20.0 | 9.1 |
| 8x4 | 200x100 | 7.4 | 188 | 10.0 | 253 | 6.4 | 162 | 8.2 | 208 | 249.5 | 17.2 | 21.4 | 9.7 |
| 8x6 | 200x150 | 7.4 | 188 | 10.0 | 253 | 6.6 | 168 | 8.9 | 225 | 249.5 | 17.2 | 25.1 | 11.4 |
| 10x1 | 250x25 | 3.5 | 88 | 6.6 | 168 | 10.7 | 273 | 11.8 | 300 | 249.5 | 17.2 | 39.9 | 18.1 |
| 10x1.5 | 250x40 | 3.5 | 88 | 6.6 | 168 | 10.7 | 273 | 12.0 | 305 | 249.5 | 17.2 | 46.3 | 21.0 |
| 10x2 | 250x50 | 3.5 | 88 | 6.6 | 168 | 10.7 | 273 | 12.5 | 318 | 249.5 | 17.2 | 52.9 | 24.0 |
| 10x3 | 250x80 | 3.9 | 100 | 7.1 | 180 | 10.7 | 273 | 12.5 | 318 | 249.5 | 17.2 | 52.9 | 24.0 |
| 10"x4 | 250x100 | 8.9 | 226 | 12.0 | 306 | 7.2 | 184 | 9.1 | 230 | 249.5 | 17.2 | 32.6 | 14.8 |
| 10x6 | 250x150 | 8.9 | 226 | 12.0 | 306 | 7.6 | 194 | 9.9 | 251 | 249.5 | 17.2 | 34.1 | 15.5 |
| 10x8 | 250x200 | 8.9 | 226 | 12.0 | 306 | 8.0 | 203 | 10.6 | 268 | 249.5 | 17.2 | 36.3 | 16.5 |
| 12x1 | 300x25 | 3.5 | 88 | 7.2 | 183 | 11.7 | 298 | 12.8 | 325 | 249.5 | 17.2 | 46.3 | 21.0 |
| 12x1.5 | 300x40 | 3.5 | 88 | 7.2 | 183 | 11.7 | 298 | 13.0 | 330 | 249.5 | 17.2 | 55.1 | 25.0 |
| 12x2 | 300x50 | 3.5 | 88 | 7.2 | 183 | 11.7 | 298 | 13.5 | 344 | 249.5 | 17.2 | 63.9 | 29.0 |
| 12x3 | 300x80 | 3.9 | 100 | 7.7 | 195 | 11.7 | 298 | 13.5 | 344 | 249.5 | 17.2 | 63.9 | 29.0 |
| 12x4 | 300x100 | 10.7 | 273 | 14.5 | 368 | 8.1 | 206 | 9.9 | 252 | 249.5 | 17.2 | 46.3 | 21.0 |
| 12x6 | 300x150 | 10.7 | 273 | 14.5 | 368 | 8.6 | 219 | 10.9 | 276 | 249.5 | 17.2 | 48.5 | 22.0 |
| 12x8 | 300x200 | 10.7 | 273 | 14.5 | 368 | 9.0 | 229 | 11.6 | 294 | 249.5 | 17.2 | 50.7 | 23.0 |
| 12x10 | 300x250 | 10.7 | 273 | 14.5 | 368 | 9.5 | 241 | 12.6 | 321 | 249.5 | 17.2 | 52.9 | 24.0 |

NOTE: The regular font style numbers are filament wound tees. The **Bold Italic** numbers are fabricated tees.

View of Fitting Illustrations



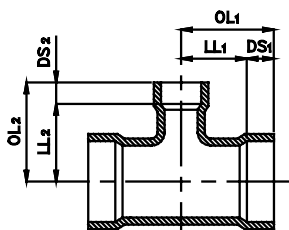
Reducing Tees

Filament-wound standard and fabricated reducing tees with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding

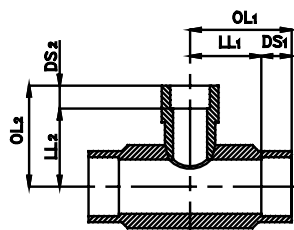
| Nominal Pipe Size | | Laying Length Total Run (LL1) | | Overall Length Total Run (OL1) | | Laying Length Branch (LL2) | | Overall Length Branch (OL2) | | Maximum Working Pressure | | Average Weight | |
|-------------------|----------------|-------------------------------|------------|--------------------------------|------------|----------------------------|------------|-----------------------------|------------|--------------------------|-------------|----------------|-------------|
| in | mm | in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 14x1 | 350x25 | 3.5 | 88 | 7.4 | 188 | 12.3 | 313 | 13.4 | 340 | 249.5 | 17.2 | 52.9 | 24.0 |
| 14x1.5 | 350x40 | 3.5 | 88 | 7.4 | 188 | 12.3 | 313 | 13.6 | 345 | 249.5 | 17.2 | 61.7 | 28.0 |
| 14x2 | 350x50 | 3.5 | 88 | 7.4 | 188 | 12.3 | 313 | 14.1 | 359 | 249.5 | 17.2 | 68.3 | 31.0 |
| 14x3 | 350x80 | 3.9 | 100 | 7.9 | 200 | 12.3 | 313 | 14.1 | 359 | 249.5 | 17.2 | 68.3 | 31.0 |
| 14x4 | 350x100 | 4.4 | 113 | 8.4 | 213 | 12.3 | 313 | 14.1 | 359 | 249.5 | 17.2 | 68.3 | 31.0 |
| 14x6 | 350x150 | 10.7 | 272 | 14.6 | 372 | 9.6 | 244 | 11.9 | 301 | 249.5 | 17.2 | 63.9 | 29.0 |
| 14x8 | 350x200 | 10.7 | 272 | 14.6 | 372 | 10.0 | 254 | 12.6 | 319 | 249.5 | 17.2 | 66.1 | 30.0 |
| 14x10 | 350x250 | 10.7 | 272 | 14.6 | 372 | 10.5 | 267 | 13.7 | 347 | 249.5 | 17.2 | 70.5 | 32.0 |
| 14x12 | 350x300 | 10.7 | 272 | 14.6 | 372 | 11.3 | 288 | 15.1 | 383 | 249.5 | 17.2 | 74.9 | 34.0 |
| 16x1 | 400x25 | 3.5 | 88 | 7.8 | 198 | 13.3 | 338 | 14.4 | 365 | 249.5 | 17.2 | 63.9 | 29.0 |
| 16x1.5 | 400x40 | 3.5 | 88 | 7.8 | 198 | 13.3 | 338 | 14.6 | 370 | 249.5 | 17.2 | 72.7 | 33.0 |
| 16x2 | 400x50 | 3.5 | 88 | 7.8 | 198 | 13.3 | 338 | 15.1 | 384 | 249.5 | 17.2 | 81.5 | 37.0 |
| 16x3 | 400x80 | 3.9 | 100 | 8.3 | 210 | 13.3 | 338 | 15.1 | 384 | 249.5 | 17.2 | 81.5 | 37.0 |
| 16x4 | 400x100 | 4.4 | 113 | 8.8 | 223 | 13.3 | 338 | 15.1 | 384 | 249.5 | 17.2 | 81.5 | 37.0 |
| 16x6 | 400x150 | 11.6 | 295 | 15.9 | 405 | 10.4 | 264 | 12.6 | 321 | 249.5 | 17.2 | 81.5 | 37.0 |
| 16x8 | 400x200 | 11.6 | 295 | 15.9 | 405 | 10.7 | 273 | 13.3 | 338 | 249.5 | 17.2 | 83.7 | 38.0 |
| 16x10 | 400x250 | 11.6 | 295 | 15.9 | 405 | 11.1 | 283 | 14.3 | 363 | 249.5 | 17.2 | 90.3 | 41.0 |
| 16x12 | 400x300 | 11.6 | 295 | 15.9 | 405 | 12.0 | 304 | 15.7 | 399 | 249.5 | 17.2 | 99.1 | 45.0 |
| 16x14 | 400x350 | 11.6 | 295 | 15.9 | 405 | 11.5 | 292 | 15.4 | 392 | 249.5 | 17.2 | 107.9 | 49.0 |
| 18x1 | 450x25 | 3.5 | 88 | 8.0 | 202 | 14.1 | 358 | 15.2 | 385 | 232.1 | 16 | 118.9 | 54.0 |
| 18x1.5 | 450x40 | 3.5 | 88 | 8.0 | 202 | 14.1 | 358 | 15.4 | 390 | 232.1 | 16 | 118.9 | 54.0 |
| 18x2 | 450x50 | 3.5 | 88 | 8.0 | 202 | 14.1 | 358 | 15.9 | 404 | 232.1 | 16 | 118.9 | 54.0 |
| 18x3 | 450x80 | 3.9 | 100 | 8.4 | 214 | 14.1 | 358 | 15.9 | 404 | 232.1 | 16 | 127.8 | 58.0 |
| 18x4 | 450x100 | 4.4 | 113 | 8.9 | 227 | 14.1 | 358 | 15.9 | 404 | 232.1 | 16 | 134.4 | 61.0 |
| 18x6 | 450x150 | 5.4 | 138 | 9.9 | 252 | 14.4 | 367 | 16.7 | 424 | 232.1 | 16 | 147.6 | 67.0 |
| 18x8 | 450x200 | 12.8 | 324 | 17.2 | 438 | 12.0 | 306 | 14.6 | 371 | 232.1 | 16 | 116.7 | 53.0 |
| 18x10 | 450x250 | 12.8 | 324 | 17.2 | 438 | 12.6 | 319 | 15.7 | 399 | 232.1 | 16 | 132.2 | 60.0 |
| 18x12 | 450x300 | 12.8 | 324 | 17.2 | 438 | 12.9 | 328 | 16.7 | 423 | 232.1 | 16 | 147.6 | 67.0 |
| 18x14 | 450x350 | 12.8 | 324 | 17.2 | 438 | 12.5 | 317 | 16.4 | 417 | 232.1 | 16 | 145.4 | 66.0 |
| 18x16 | 450x400 | 12.8 | 324 | 17.2 | 438 | 12.6 | 319 | 16.9 | 429 | 232.1 | 16 | 152.0 | 69.0 |
| 20x1 | 500x25 | 3.5 | 88 | 8.5 | 215 | 15.0 | 382 | 16.1 | 409 | 232.1 | 16 | 130.0 | 59.0 |
| 20x1.5 | 500x40 | 3.5 | 88 | 8.5 | 215 | 15.0 | 382 | 16.3 | 414 | 232.1 | 16 | 132.2 | 60.0 |
| 20x2 | 500x50 | 3.5 | 88 | 8.5 | 215 | 15.0 | 382 | 16.9 | 428 | 232.1 | 16 | 132.2 | 60.0 |
| 20x3 | 500x80 | 3.9 | 100 | 8.9 | 227 | 15.0 | 382 | 16.9 | 428 | 232.1 | 16 | 138.8 | 63.0 |
| 20x4 | 500x100 | 4.4 | 113 | 9.4 | 240 | 15.0 | 382 | 16.9 | 428 | 232.1 | 16 | 147.6 | 67.0 |
| 20x6 | 500x150 | 5.4 | 138 | 10.4 | 265 | 15.4 | 391 | 17.6 | 448 | 232.1 | 16 | 154.2 | 70.0 |
| 20x10 | 500x250 | 14.0 | 356 | 19.0 | 483 | 13.5 | 344 | 16.7 | 424 | 232.1 | 16 | 169.6 | 77.0 |
| 20x12 | 500x300 | 14.0 | 356 | 19.0 | 483 | 13.9 | 354 | 17.7 | 449 | 232.1 | 16 | 180.6 | 82.0 |
| 20x14 | 500x350 | 14.0 | 356 | 19.0 | 483 | 13.5 | 343 | 17.4 | 443 | 232.1 | 16 | 187.2 | 85.0 |
| 20x16 | 500x400 | 14.0 | 356 | 19.0 | 483 | 13.5 | 344 | 17.9 | 454 | 232.1 | 16 | 187.2 | 85.0 |
| 20x18 | 500x450 | 14.0 | 356 | 19.0 | 483 | 13.8 | 350 | 18.3 | 464 | 232.1 | 16 | 196.0 | 89.0 |

NOTE: Tees main-run (18-40 inch) with Quick-Lock socket branch (1-6 inch) are fabricated Tees. The regular font style numbers are filament wound tees. The **Bold Italic** numbers are fabricated tees.

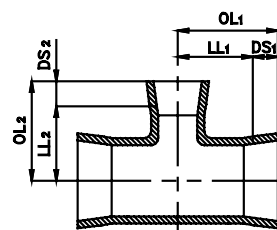
View of Fitting Illustrations



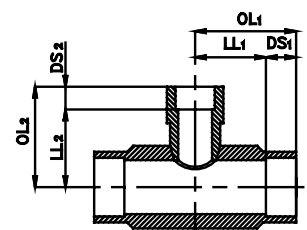
Quick-Lock Filament Wound



Quick-Lock Fabricated



Taper/Taper Filament Wound



Taper/Taper Fabricated

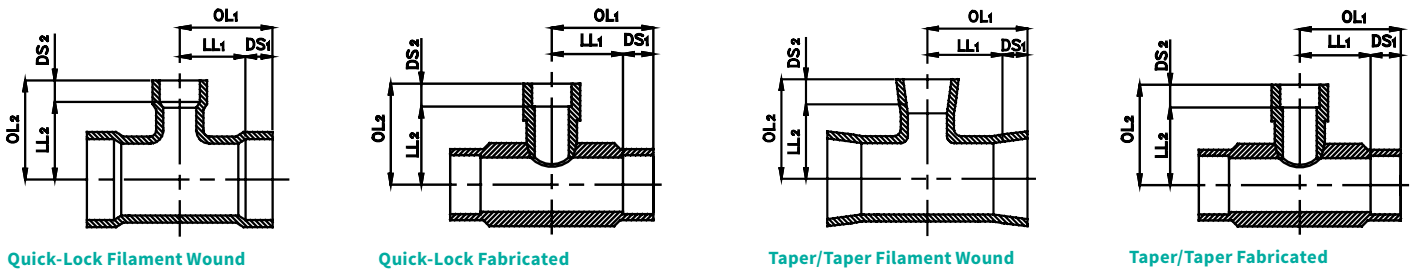
Reducing Tees

Filament-wound standard and fabricated reducing tees with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding

| Nominal Pipe Size | | Laying Length Total Run (LL1) | | Overall Length Total Run (OL1) | | Laying Length Branch (LL2) | | Overall Length Branch (OL2) | | Maximum Working Pressure | | Average Weight | |
|-------------------|----------------|-------------------------------|------------|--------------------------------|------------|----------------------------|------------|-----------------------------|------------|--------------------------|-----------|----------------|--------------|
| in | mm | in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 22x8 | 550x200 | 15.3 | 388 | 21.3 | 540 | 14.1 | 357 | 16.6 | 422 | 232.1 | 16 | 176.2 | 80.0 |
| 22x10 | 550x250 | 15.3 | 388 | 21.3 | 540 | 14.6 | 370 | 17.7 | 450 | 232.1 | 16 | 187.2 | 85.0 |
| 22x12 | 550x300 | 15.3 | 388 | 21.3 | 540 | 14.9 | 379 | 18.7 | 474 | 232.1 | 16 | 198.2 | 90.0 |
| 22x14 | 550x350 | 15.3 | 388 | 21.3 | 540 | 14.5 | 368 | 18.4 | 468 | 232.1 | 16 | 207.0 | 94.0 |
| 22x16 | 550x400 | 15.3 | 388 | 21.3 | 540 | 14.6 | 370 | 18.9 | 480 | 232.1 | 16 | 207.0 | 94.0 |
| 22x18 | 550x450 | 15.3 | 388 | 21.3 | 540 | 14.8 | 375 | 19.3 | 489 | 232.1 | 16 | 215.9 | 98.0 |
| 22x20 | 550x500 | 15.3 | 388 | 21.3 | 540 | 15.0 | 381 | 20.0 | 508 | 232.1 | 16 | 224.7 | 102.0 |
| 24x1 | 600x25 | 3.5 | 88 | 10.5 | 266 | 16.9 | 430 | 18.0 | 457 | 232.1 | 16 | 156.4 | 71.0 |
| 24x1.5 | 600x40 | 3.5 | 88 | 10.5 | 266 | 16.9 | 430 | 18.2 | 462 | 232.1 | 16 | 156.4 | 71.0 |
| 24x2 | 600x50 | 3.5 | 88 | 10.5 | 266 | 16.9 | 430 | 18.7 | 476 | 232.1 | 16 | 156.4 | 71.0 |
| 24x3 | 600x80 | 3.9 | 100 | 10.9 | 278 | 16.9 | 430 | 18.7 | 476 | 232.1 | 16 | 165.2 | 75.0 |
| 24x4 | 600x100 | 4.4 | 113 | 11.5 | 291 | 16.9 | 430 | 18.7 | 476 | 232.1 | 16 | 176.2 | 80.0 |
| 24x6 | 600x150 | 5.4 | 138 | 12.4 | 316 | 17.3 | 439 | 19.5 | 496 | 232.1 | 16 | 187.2 | 85.0 |
| 24x8 | 600x200 | 16.5 | 419 | 23.5 | 597 | 16.2 | 412 | 18.8 | 477 | 232.1 | 16 | 193.8 | 88.0 |
| 24x10 | 600x250 | 16.5 | 419 | 23.5 | 597 | 15.2 | 386 | 18.3 | 466 | 232.1 | 16 | 204.8 | 93.0 |
| 24x12 | 600x300 | 16.5 | 419 | 23.5 | 597 | 16.4 | 417 | 20.2 | 512 | 232.1 | 16 | 215.9 | 98.0 |
| 24x14 | 600x350 | 16.5 | 419 | 23.5 | 597 | 15.5 | 394 | 19.4 | 494 | 232.1 | 16 | 226.9 | 103.0 |
| 24x16 | 600x400 | 16.5 | 419 | 23.5 | 597 | 15.6 | 395 | 19.9 | 505 | 232.1 | 16 | 226.9 | 103.0 |
| 24x18 | 600x450 | 16.5 | 419 | 23.5 | 597 | 16.3 | 413 | 20.7 | 527 | 232.1 | 16 | 301.8 | 137.0 |
| 24x20 | 600x500 | 16.5 | 419 | 23.5 | 597 | 16.0 | 406 | 21.0 | 533 | 232.1 | 16 | 343.6 | 156.0 |
| 26x1 | 650x25 | 3.5 | 88 | 10.5 | 266 | 18.3 | 466 | 19.4 | 493 | 232.1 | 16 | 171.8 | 78.0 |
| 26x1.5 | 650x40 | 3.5 | 88 | 10.5 | 266 | 18.3 | 466 | 19.6 | 498 | 232.1 | 16 | 171.8 | 78.0 |
| 26x2 | 650x50 | 3.5 | 88 | 10.5 | 266 | 18.3 | 466 | 20.2 | 512 | 232.1 | 16 | 171.8 | 78.0 |
| 26x3 | 650x80 | 3.9 | 100 | 10.9 | 278 | 18.3 | 466 | 20.2 | 512 | 232.1 | 16 | 182.8 | 83.0 |
| 26x4 | 650x100 | 4.4 | 113 | 11.5 | 291 | 18.3 | 466 | 20.2 | 512 | 232.1 | 16 | 193.8 | 88.0 |
| 26x6 | 650x150 | 5.4 | 138 | 12.4 | 316 | 18.7 | 475 | 20.9 | 532 | 232.1 | 16 | 209.3 | 95.0 |
| 26x18 | 650x450 | 17.4 | 443 | 24.4 | 621 | 17.3 | 440 | 21.8 | 554 | 232.1 | 16 | 354.6 | 161.0 |
| 26x20 | 650x500 | 17.4 | 443 | 24.4 | 621 | 17.3 | 440 | 22.3 | 567 | 232.1 | 16 | 394.3 | 179.0 |
| 26x24 | 650x600 | 17.4 | 443 | 24.4 | 621 | 17.3 | 440 | 24.3 | 618 | 232.1 | 16 | 495.6 | 225.0 |
| 28x1 | 700x25 | 3.5 | 88 | 10.5 | 266 | 19.3 | 491 | 20.4 | 518 | 232.1 | 16 | 213.7 | 97.0 |
| 28x1.5 | 700x40 | 3.5 | 88 | 10.5 | 266 | 19.3 | 491 | 20.6 | 523 | 232.1 | 16 | 213.7 | 97.0 |
| 28x2 | 700x50 | 3.5 | 88 | 10.5 | 266 | 19.3 | 491 | 21.1 | 537 | 232.1 | 16 | 213.7 | 97.0 |
| 28x3 | 700x80 | 3.9 | 100 | 10.9 | 278 | 19.3 | 491 | 21.1 | 537 | 232.1 | 16 | 224.7 | 102.0 |
| 28x4 | 700x100 | 4.4 | 113 | 11.5 | 291 | 19.3 | 491 | 21.1 | 537 | 232.1 | 16 | 235.7 | 107.0 |
| 28x6 | 700x150 | 5.4 | 138 | 12.4 | 316 | 19.7 | 500 | 21.9 | 557 | 232.1 | 16 | 264.3 | 120.0 |
| 28x14 | 700x350 | 19.0 | 482 | 26.0 | 660 | 19.3 | 490 | 23.2 | 590 | 232.1 | 16 | 323.8 | 147.0 |
| 28x16 | 700x400 | 19.0 | 482 | 26.0 | 660 | 19.7 | 500 | 24.0 | 610 | 232.1 | 16 | 365.6 | 166.0 |
| 28x18 | 700x450 | 19.0 | 482 | 26.0 | 660 | 19.7 | 500 | 24.2 | 614 | 232.1 | 16 | 416.3 | 189.0 |
| 28x20 | 700x500 | 19.0 | 482 | 26.0 | 660 | 19.9 | 506 | 24.9 | 633 | 232.1 | 16 | 462.6 | 210.0 |
| 28x24 | 700x600 | 19.0 | 482 | 26.0 | 660 | 19.9 | 506 | 26.9 | 684 | 232.1 | 16 | 555.1 | 252.0 |

NOTE: Tees main-run (18-40 inch) with Quick-Lock socket branch (1-6 inch) are fabricated Tees. The regular font style numbers are filament wound tees. The **Bold Italic** numbers are fabricated tees.

View of Fitting Illustrations



Quick-Lock Filament Wound

Quick-Lock Fabricated

Taper/Taper Filament Wound

Taper/Taper Fabricated

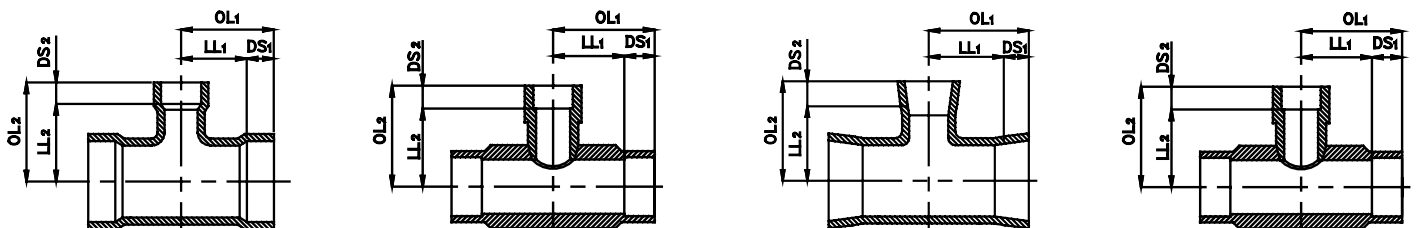
Reducing Tees

Filament-wound standard and fabricated reducing tees with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding

| Nominal Pipe Size | | Laying Length Total Run (LL1) | | Overall Length Total Run (OL1) | | Laying Length Branch (LL2) | | Overall Length Branch (OL2) | | Maximum Working Pressure | | Average Weight | |
|-------------------|-----------------|-------------------------------|------------|--------------------------------|------------|----------------------------|------------|-----------------------------|------------|--------------------------|-----------|----------------|--------------|
| in | mm | in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 30x1 | 750x25 | 3.5 | 88 | 10.5 | 266 | 20.3 | 516 | 21.4 | 543 | 232.1 | 16 | 226.9 | 103.0 |
| 30x1.5 | 750x40 | 3.5 | 88 | 10.5 | 266 | 20.3 | 516 | 21.6 | 548 | 232.1 | 16 | 226.9 | 103.0 |
| 30x2 | 750x50 | 3.5 | 88 | 10.5 | 266 | 20.3 | 516 | 22.1 | 562 | 232.1 | 16 | 226.9 | 103.0 |
| 30x3 | 750x80 | 3.9 | 100 | 10.9 | 278 | 20.3 | 516 | 22.1 | 562 | 232.1 | 16 | 240.1 | 109.0 |
| 30x4 | 750x100 | 4.4 | 113 | 11.5 | 291 | 20.3 | 516 | 22.1 | 562 | 232.1 | 16 | 251.1 | 114.0 |
| 30x6 | 750x150 | 5.4 | 138 | 12.4 | 316 | 20.7 | 525 | 22.9 | 582 | 232.1 | 16 | 264.3 | 120.0 |
| 30x12 | 750x300 | 20.0 | 508 | 27.0 | 686 | 30.1 | 765 | 33.9 | 860 | 232.1 | 16 | 259.9 | 118.0 |
| 30x14 | 750x350 | 20.0 | 508 | 27.0 | 686 | 28.4 | 722 | 32.4 | 822 | 232.1 | 16 | 345.8 | 157.0 |
| 30x16 | 750x400 | 20.0 | 508 | 27.0 | 686 | 27.5 | 698 | 31.8 | 808 | 232.1 | 16 | 392.1 | 178.0 |
| 30x18 | 750x450 | 20.0 | 508 | 27.0 | 686 | 19.2 | 488 | 23.7 | 602 | 232.1 | 16 | 444.9 | 202.0 |
| 30x20 | 750x500 | 20.0 | 508 | 27.0 | 686 | 19.5 | 495 | 24.5 | 622 | 232.1 | 16 | 495.6 | 225.0 |
| 30x24 | 750x600 | 20.0 | 508 | 27.0 | 686 | 18.9 | 481 | 25.9 | 659 | 232.1 | 16 | 594.7 | 270.0 |
| 32x1 | 800x25 | 3.5 | 88 | 10.5 | 266 | 21.3 | 541 | 22.4 | 568 | 232.1 | 16 | 273.1 | 124.0 |
| 32x1.5 | 800x40 | 3.5 | 88 | 10.5 | 266 | 21.3 | 541 | 22.6 | 573 | 232.1 | 16 | 273.1 | 124.0 |
| 32x2 | 800x50 | 3.5 | 88 | 10.5 | 266 | 21.3 | 541 | 23.1 | 587 | 232.1 | 16 | 273.1 | 124.0 |
| 32x3 | 800x80 | 3.9 | 100 | 10.9 | 278 | 21.3 | 541 | 23.1 | 587 | 232.1 | 16 | 286.3 | 130.0 |
| 32x4 | 800x100 | 4.4 | 113 | 11.5 | 291 | 21.3 | 541 | 23.1 | 587 | 232.1 | 16 | 299.6 | 136.0 |
| 32x6 | 800x150 | 5.4 | 138 | 12.4 | 316 | 21.7 | 550 | 23.9 | 607 | 232.1 | 16 | 319.4 | 145.0 |
| 32x20 | 800x500 | 21.5 | 545 | 28.5 | 723 | 20.6 | 523 | 25.6 | 650 | 232.1 | 16 | 568.3 | 258.0 |
| 32x24 | 800x600 | 21.5 | 545 | 28.5 | 723 | 20.6 | 523 | 27.6 | 701 | 232.1 | 16 | 682.8 | 310.0 |
| 32x28 | 800x700 | 21.5 | 545 | 28.5 | 723 | 20.9 | 532 | 28.0 | 710 | 232.1 | 16 | 766.5 | 348.0 |
| 32x30 | 800x750 | 21.5 | 545 | 28.5 | 723 | 21.0 | 534 | 28.0 | 712 | 232.1 | 16 | 852.4 | 387.0 |
| 36x1 | 900x25 | 3.5 | 88 | 11.5 | 291 | 23.3 | 591 | 24.3 | 618 | 232.1 | 16 | 341.4 | 155.0 |
| 36x1.5 | 900x40 | 3.5 | 88 | 11.5 | 291 | 23.3 | 591 | 24.5 | 623 | 232.1 | 16 | 341.4 | 155.0 |
| 36x2 | 900x50 | 3.5 | 88 | 11.5 | 291 | 23.3 | 591 | 25.1 | 637 | 232.1 | 16 | 341.4 | 155.0 |
| 36x3 | 900x80 | 3.9 | 100 | 11.9 | 303 | 23.3 | 591 | 25.1 | 637 | 232.1 | 16 | 354.6 | 161.0 |
| 36x4 | 900x100 | 4.4 | 113 | 12.4 | 316 | 23.3 | 591 | 25.1 | 637 | 232.1 | 16 | 370.0 | 168.0 |
| 36x6 | 900x150 | 5.4 | 138 | 13.4 | 341 | 23.6 | 600 | 25.9 | 657 | 232.1 | 16 | 396.5 | 180.0 |
| 36x16 | 900x400 | 24.0 | 610 | 32.0 | 813 | 22.2 | 563 | 26.5 | 673 | 232.1 | 16 | 594.7 | 270.0 |
| 36x18 | 900x450 | 24.0 | 610 | 32.0 | 813 | 22.2 | 563 | 26.7 | 677 | 232.1 | 16 | 638.8 | 290.0 |
| 36"20 | 900x500 | 24.0 | 610 | 32.0 | 813 | 22.2 | 563 | 27.2 | 690 | 232.1 | 16 | 711.5 | 323.0 |
| 36x24 | 900x600 | 24.0 | 610 | 32.0 | 813 | 21.3 | 541 | 28.3 | 719 | 232.1 | 16 | 852.4 | 387.0 |
| 36x28 | 900x700 | 24.0 | 610 | 32.0 | 813 | 22.4 | 570 | 29.4 | 748 | 232.1 | 16 | 1011.0 | 459.0 |
| 36x30 | 900x750 | 24.0 | 610 | 32.0 | 813 | 23.0 | 584 | 30.0 | 762 | 232.1 | 16 | 1066.1 | 484.0 |
| 40x1 | 1000x25 | 4.7 | 120 | 17.3 | 440 | 25.2 | 641 | 26.3 | 668 | 232.1 | 16 | 418.5 | 190.0 |
| 40x1.5 | 1000x40 | 4.7 | 120 | 17.3 | 440 | 25.2 | 641 | 26.5 | 673 | 232.1 | 16 | 418.5 | 190.0 |
| 40x2 | 1000x50 | 4.7 | 120 | 17.3 | 440 | 25.2 | 641 | 27.0 | 687 | 232.1 | 16 | 418.5 | 190.0 |
| 40x3 | 1000x80 | 5.2 | 132 | 17.8 | 452 | 25.2 | 641 | 27.0 | 687 | 232.1 | 16 | 431.7 | 196.0 |
| 40x4 | 1000x100 | 5.7 | 145 | 18.3 | 465 | 25.2 | 641 | 27.0 | 687 | 232.1 | 16 | 447.1 | 203.0 |
| 40x24 | 1000x600 | 28.9 | 733 | 41.5 | 1053 | 23.3 | 593 | 30.4 | 771 | 232.1 | 16 | 1004.4 | 456.0 |
| 40x28 | 1000x700 | 28.9 | 733 | 41.5 | 1053 | 24.9 | 632 | 31.9 | 810 | 232.1 | 16 | 1191.6 | 541.0 |
| 40x30 | 1000x750 | 28.9 | 733 | 41.5 | 1053 | 24.9 | 633 | 31.9 | 811 | 232.1 | 16 | 1257.7 | 571.0 |
| 40x32 | 1000x800 | 28.9 | 733 | 41.5 | 1053 | 25.7 | 652 | 32.7 | 830 | 232.1 | 16 | 1332.6 | 605.0 |
| 40x36 | 1000x900 | 28.9 | 733 | 41.5 | 1053 | 25.7 | 652 | 33.7 | 855 | 232.1 | 16 | 1396.5 | 634.0 |

NOTE: Tees main-run (18-40 inch) with Quick-Lock socket branch (1-6 inch) are fabricated Tees. The regular font style numbers are filament wound tees. The **Bold Italic** numbers are fabricated tees.

View of Fitting Illustrations



Quick-Lock Filament Wound

Quick-Lock Fabricated

Taper/Taper Filament Wound

Taper/Taper Fabricated

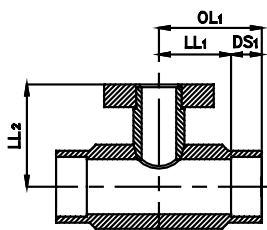
Fabricated Reducing Tees with Flanged Branch

Integral Quick-Lock (4-6 inch) or Taper (8-16 inch) socket ends with flanged branch

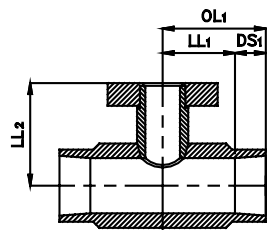
| Nominal Pipe Size | | Laying Length Half Run (LL1) | | Overall Length Half Run (OL1) | | Laying Length Branch (LL2) | | Maximum Working Pressure | | Average Weight | |
|-------------------|---------|------------------------------|-------|-------------------------------|-----|----------------------------|-------|--------------------------|------|----------------|-------|
| in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 4x1 | 100x25 | 2.8 | 72.0 | 4.6 | 118 | 8.8 | 224.0 | 249.5 | 17.2 | 17.6 | 8.0 |
| 4x1.5 | 100x40 | 3.5 | 89.0 | 5.3 | 135 | 9.0 | 229.0 | 249.5 | 17.2 | 21.4 | 9.7 |
| 6x1 | 150x25 | 3.3 | 83.0 | 5.5 | 140 | 9.9 | 251.0 | 249.5 | 17.2 | 26.9 | 12.2 |
| 6x1.5 | 150x40 | 4.0 | 101.0 | 6.2 | 158 | 10.1 | 256.0 | 249.5 | 17.2 | 31.9 | 14.5 |
| 8x1 | 200x25 | 3.5 | 88.0 | 6.0 | 153 | 10.9 | 276.0 | 249.5 | 17.2 | 34.1 | 15.5 |
| 8x1.5 | 200x40 | 3.5 | 88.0 | 6.0 | 153 | 11.1 | 281.0 | 249.5 | 17.2 | 40.1 | 18.2 |
| 8x2 | 200x50 | 3.5 | 88.0 | 6.0 | 153 | 11.6 | 295.0 | 249.5 | 17.2 | 46.3 | 21.0 |
| 10x1 | 250x25 | 3.5 | 88.0 | 6.6 | 168 | 11.9 | 303.0 | 249.5 | 17.2 | 41.0 | 18.6 |
| 10x1.5 | 250x40 | 3.5 | 88.0 | 6.6 | 168 | 12.1 | 308.0 | 249.5 | 17.2 | 48.5 | 22.0 |
| 10x2 | 250x50 | 3.5 | 88.0 | 6.6 | 168 | 12.7 | 322.0 | 249.5 | 17.2 | 57.3 | 26.0 |
| 10x3 | 250x80 | 3.9 | 100.0 | 7.1 | 180 | 12.7 | 323.0 | 249.5 | 17.2 | 57.3 | 26.0 |
| 12x1 | 300x25 | 3.5 | 88.0 | 7.2 | 183 | 13.0 | 329.0 | 249.5 | 17.2 | 48.5 | 22.0 |
| 12x1.5 | 300x40 | 3.5 | 88.0 | 7.2 | 183 | 13.1 | 334.0 | 249.5 | 17.2 | 57.3 | 26.0 |
| 12x2 | 300x50 | 3.5 | 88.0 | 7.2 | 183 | 13.7 | 348.0 | 249.5 | 17.2 | 66.1 | 30.0 |
| 12x3 | 300x80 | 3.9 | 100.0 | 7.7 | 195 | 13.7 | 349.0 | 249.5 | 17.2 | 68.3 | 31.0 |
| 14x1 | 350x25 | 3.5 | 88.0 | 7.4 | 188 | 13.5 | 344.0 | 249.5 | 17.2 | 52.9 | 24.0 |
| 14x1.5 | 350x40 | 3.5 | 88.0 | 7.4 | 188 | 13.7 | 349.0 | 249.5 | 17.2 | 61.7 | 28.0 |
| 14x2 | 350x50 | 3.5 | 88.0 | 7.4 | 188 | 14.3 | 363.0 | 249.5 | 17.2 | 72.7 | 33.0 |
| 14x3 | 350x80 | 3.9 | 100.0 | 7.9 | 200 | 14.3 | 364.0 | 249.5 | 17.2 | 72.7 | 33.0 |
| 14x4 | 350x100 | 4.4 | 113.0 | 8.4 | 213 | 14.3 | 364.0 | 249.5 | 17.2 | 74.9 | 34.0 |
| 16x1 | 400x25 | 3.3 | 85.0 | 7.4 | 187 | 14.5 | 369.0 | 249.5 | 17.2 | 63.9 | 29.0 |
| 16x1.5 | 400x40 | 4.1 | 103.0 | 8.1 | 205 | 14.7 | 374.0 | 249.5 | 17.2 | 74.9 | 34.0 |
| 16x2 | 400x50 | 4.6 | 118.0 | 8.7 | 220 | 15.3 | 388.0 | 249.5 | 17.2 | 85.9 | 39.0 |
| 16x3 | 400x80 | 4.6 | 118.0 | 8.7 | 220 | 15.3 | 389.0 | 249.5 | 17.2 | 85.9 | 39.0 |
| 16x4 | 400x100 | 4.6 | 118.0 | 8.7 | 220 | 15.3 | 389.0 | 249.5 | 17.2 | 88.1 | 40.0 |
| 18x1 | 450x25 | 3.5 | 88.0 | 8.0 | 202 | 15.3 | 388.0 | 232.1 | 16.0 | 121.1 | 55.0 |
| 18x1.5 | 450x40 | 3.5 | 88.0 | 8.0 | 202 | 15.5 | 394.0 | 232.1 | 16.0 | 121.1 | 55.0 |
| 18x2 | 450x50 | 3.5 | 88.0 | 8.0 | 202 | 16.1 | 408.0 | 232.1 | 16.0 | 123.3 | 56.0 |
| 18x3 | 450x80 | 3.9 | 100.0 | 8.4 | 214 | 16.1 | 409.0 | 232.1 | 16.0 | 132.2 | 60.0 |
| 18x4 | 450x100 | 4.4 | 113.0 | 8.9 | 227 | 16.1 | 409.0 | 232.1 | 16.0 | 141.0 | 64.0 |
| 18x6 | 450x150 | 5.4 | 138.0 | 9.9 | 252 | 16.9 | 430.0 | 232.1 | 16.0 | 319.4 | 145.0 |
| 20x1 | 500x25 | 3.5 | 88.0 | 8.5 | 215 | 16.2 | 412.0 | 232.1 | 16.0 | 132.2 | 60.0 |
| 20x1.5 | 500x40 | 3.5 | 88.0 | 8.5 | 215 | 16.5 | 418.0 | 232.1 | 16.0 | 134.4 | 61.0 |
| 20x2 | 500x50 | 3.5 | 88.0 | 8.5 | 215 | 17.0 | 432.0 | 232.1 | 16.0 | 143.2 | 65.0 |
| 20x3 | 500x80 | 3.9 | 100.0 | 8.9 | 227 | 17.0 | 433.0 | 232.1 | 16.0 | 154.2 | 70.0 |
| 20x4 | 500x100 | 4.4 | 113.0 | 9.4 | 240 | 17.0 | 433.0 | 232.1 | 16.0 | 165.2 | 75.0 |

NOTE: Other sizes, or multiple size branched tees available on request. Please contact NOV Fiber Glass Systems.

View of Fitting Illustrations



Quick-Lock



Taper/Taper

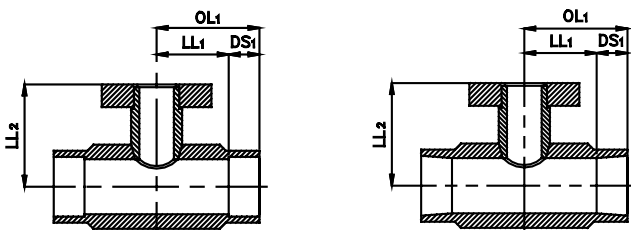
Fabricated Reducing Tees with Flanged Branch

Integral Quick-Lock (4-6 inch) or Taper (8-16 inch) socket ends with flanged branch

| Nominal Pipe Size | | Laying Length Half Run (LL1) | | Overall Length Half Run (OL1) | | Laying Length Branch (LL2) | | Maximum Working Pressure | | Average Weight | |
|-------------------|----------|------------------------------|-------|-------------------------------|-----|----------------------------|-------|--------------------------|------|----------------|-------|
| in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 24x1 | 600x25 | 3.5 | 88.0 | 10.5 | 266 | 18.1 | 460.0 | 232.1 | 16.0 | 156.4 | 71.0 |
| 24x1.5 | 600x40 | 3.5 | 88.0 | 10.5 | 266 | 18.4 | 467.0 | 232.1 | 16.0 | 158.6 | 72.0 |
| 24x2 | 600x50 | 3.5 | 88.0 | 10.5 | 266 | 18.9 | 480.0 | 232.1 | 16.0 | 158.6 | 72.0 |
| 24x3 | 600x80 | 3.9 | 100.0 | 10.9 | 278 | 18.9 | 481.0 | 232.1 | 16.0 | 169.6 | 77.0 |
| 24x4 | 600x100 | 4.4 | 113.0 | 11.5 | 291 | 18.9 | 481.0 | 232.1 | 16.0 | 180.6 | 82.0 |
| 26x1 | 650x25 | 3.5 | 88.0 | 10.5 | 266 | 19.6 | 497.0 | 232.1 | 16.0 | 174.0 | 79.0 |
| 26x1.5 | 650x40 | 3.5 | 88.0 | 10.5 | 266 | 19.8 | 502.0 | 232.1 | 16.0 | 174.0 | 79.0 |
| 26x2 | 650x50 | 3.5 | 88.0 | 10.5 | 266 | 20.3 | 516.0 | 232.1 | 16.0 | 176.2 | 80.0 |
| 26x3 | 650x80 | 3.9 | 100.0 | 10.9 | 278 | 20.4 | 517.0 | 232.1 | 16.0 | 187.2 | 85.0 |
| 26x4 | 650x100 | 4.4 | 113.0 | 11.5 | 291 | 20.4 | 517.0 | 232.1 | 16.0 | 200.4 | 91.0 |
| 28x1 | 700x25 | 3.5 | 88.0 | 10.5 | 266 | 20.5 | 521.0 | 232.1 | 16.0 | 213.7 | 97.0 |
| 28x1.5 | 700x40 | 3.5 | 88.0 | 10.5 | 266 | 20.7 | 527.0 | 232.1 | 16.0 | 215.9 | 98.0 |
| 28x2 | 700x50 | 3.5 | 88.0 | 10.5 | 266 | 21.3 | 541.0 | 232.1 | 16.0 | 215.9 | 98.0 |
| 28x3 | 700x80 | 3.9 | 100.0 | 10.9 | 278 | 21.3 | 542.0 | 232.1 | 16.0 | 229.1 | 104.0 |
| 28x4 | 700x100 | 4.4 | 113.0 | 11.5 | 291 | 21.3 | 542.0 | 232.1 | 16.0 | 242.3 | 110.0 |
| 30x1 | 750x25 | 3.5 | 88.0 | 10.5 | 266 | 21.5 | 546.0 | 232.1 | 16.0 | 229.1 | 104.0 |
| 30x1.5 | 750x40 | 3.5 | 88.0 | 10.5 | 266 | 21.7 | 552.0 | 232.1 | 16.0 | 229.1 | 104.0 |
| 30x2 | 750x50 | 3.5 | 88.0 | 10.5 | 266 | 22.3 | 566.0 | 232.1 | 16.0 | 229.1 | 104.0 |
| 30x3 | 750x80 | 3.9 | 100.0 | 10.9 | 278 | 22.3 | 567.0 | 232.1 | 16.0 | 244.5 | 111.0 |
| 30x4 | 750x100 | 4.4 | 113.0 | 11.5 | 291 | 22.3 | 567.0 | 232.1 | 16.0 | 257.7 | 117.0 |
| 32x1 | 800x25 | 3.5 | 88.0 | 10.5 | 266 | 22.5 | 571.0 | 232.1 | 16.0 | 273.1 | 124.0 |
| 32x1.5 | 800x40 | 3.5 | 88.0 | 10.5 | 266 | 22.7 | 576.0 | 232.1 | 16.0 | 275.3 | 125.0 |
| 32x2 | 800x50 | 3.5 | 88.0 | 10.5 | 266 | 23.2 | 590.0 | 232.1 | 16.0 | 275.3 | 125.0 |
| 32x3 | 800x80 | 3.9 | 100.0 | 10.9 | 278 | 23.2 | 590.0 | 232.1 | 16.0 | 290.7 | 132.0 |
| 32x4 | 800x100 | 4.4 | 113.0 | 11.5 | 291 | 23.2 | 590.0 | 232.1 | 16.0 | 306.2 | 139.0 |
| 36x1 | 900x25 | 3.5 | 88.0 | 11.5 | 291 | 24.4 | 621.0 | 232.1 | 16.0 | 341.4 | 155.0 |
| 36x1.5 | 900x40 | 3.5 | 88.0 | 11.5 | 291 | 24.7 | 627.0 | 232.1 | 16.0 | 343.6 | 156.0 |
| 36x2 | 900x50 | 3.5 | 88.0 | 11.5 | 291 | 25.2 | 641.0 | 232.1 | 16.0 | 343.6 | 156.0 |
| 36x3 | 900x80 | 3.9 | 100.0 | 11.9 | 303 | 25.3 | 642.0 | 232.1 | 16.0 | 359.0 | 163.0 |
| 36x4 | 900x100 | 4.4 | 113.0 | 12.4 | 316 | 25.3 | 642.0 | 232.1 | 16.0 | 376.7 | 171.0 |
| 40x1 | 1000x25 | 4.7 | 120.0 | 17.3 | 440 | 26.5 | 672.0 | 232.1 | 16.0 | 420.7 | 191.0 |
| 40x1.5 | 1000x40 | 4.7 | 120.0 | 17.3 | 440 | 26.7 | 677.0 | 232.1 | 16.0 | 420.7 | 191.0 |
| 40x2 | 1000x50 | 4.7 | 120.0 | 17.3 | 440 | 27.2 | 691.0 | 232.1 | 16.0 | 420.7 | 191.0 |
| 40x3 | 1000x80 | 5.2 | 132.0 | 17.8 | 452 | 27.2 | 692.0 | 232.1 | 16.0 | 436.1 | 198.0 |
| 40x4 | 1000x100 | 5.7 | 145.0 | 18.3 | 465 | 27.2 | 692.0 | 232.1 | 16.0 | 453.7 | 206.0 |

NOTE: Other sizes, or multiple size branched tees available on request. Please contact NOV Fiber Glass Systems.

View of Fitting Illustrations



Quick-Lock

Taper/Taper

Bushing Saddle

Filament-wound pipe saddles with stainless steel, 1/2 inch and 3/4 inch threaded bushings.⁽¹⁾

| Nominal Pipe Size | | Angle (a) | Saddle Length (B) | | Saddle Thickness (ts) | | Maximum Working Pressure | | Average Weight | | Required Adhesive Kit | |
|-------------------|------|-----------|-------------------|-------|-----------------------|----|--------------------------|------|----------------|-----|-----------------------|------|
| in | mm | degree | in | mm | in | mm | psi | bar | lb | kg | 3 oz. | 6 oz |
| 2 | 50 | 180 | 6.0 | 152.0 | 0.9 | 22 | 249.5 | 17.2 | 1.1 | 0.5 | 1 | - |
| 3 | 80 | 180 | 6.0 | 152.0 | 0.9 | 22 | 249.5 | 17.2 | 1.3 | 0.6 | 1 | - |
| 4 | 100 | 180 | 6.0 | 152.0 | 0.9 | 22 | 249.5 | 17.2 | 1.8 | 0.8 | 1 | - |
| 5 | 125 | 180 | 6.0 | 152.0 | 0.9 | 22 | 249.5 | 17.2 | 2.0 | 0.9 | - | 1 |
| 6 | 150 | 180 | 6.0 | 152.0 | 0.9 | 22 | 249.5 | 17.2 | 2.2 | 1.0 | - | 1 |
| 8 | 200 | 180 | 6.0 | 152.0 | 0.9 | 22 | 249.5 | 17.2 | 2.6 | 1.2 | - | 1 |
| 10 | 250 | 180 | 6.0 | 152.0 | 0.9 | 22 | 249.5 | 17.2 | 3.5 | 1.6 | 1 | 1 |
| 12 | 300 | 180 | 6.0 | 152.0 | 0.9 | 22 | 174.0 | 12.0 | 4.2 | 1.9 | 1 | 1 |
| 14 | 350 | 180 | 6.0 | 152.0 | 0.9 | 22 | 174.0 | 12.0 | 4.6 | 2.1 | 1 | 1 |
| 16 | 400 | 180 | 6.0 | 152.0 | 0.9 | 22 | 174.0 | 12.0 | 5.5 | 2.5 | - | 2 |
| 18 | 450 | 90 | 6.0 | 152.0 | 0.9 | 22 | 174.0 | 12.0 | 7.3 | 3.3 | - | 1 |
| 20 | 500 | 90 | 6.0 | 152.0 | 0.9 | 22 | 174.0 | 12.0 | 8.1 | 3.7 | 1 | 1 |
| 22 | 550 | 90 | 6.0 | 152.0 | 0.9 | 22 | | | | | | |
| 24 | 600 | 90 | 6.0 | 152.0 | 0.9 | 22 | 174.0 | 12.0 | 9.7 | 4.4 | - | 2 |
| 26 | 650 | 90 | 6.0 | 152.0 | 0.9 | 22 | | | | | | |
| 28 | 700 | 90 | 6.0 | 152.0 | 0.9 | 22 | | | | | | |
| 30 | 750 | 90 | 6.0 | 152.0 | 0.9 | 22 | | | | | | |
| 32 | 800 | 90 | 6.0 | 152.0 | 0.9 | 22 | | | | | | |
| 36 | 900 | 90 | 6.0 | 152.0 | 0.9 | 22 | | | | | | |
| 40 | 1000 | 90 | 6.0 | 152.0 | 0.9 | 22 | | | | | | |

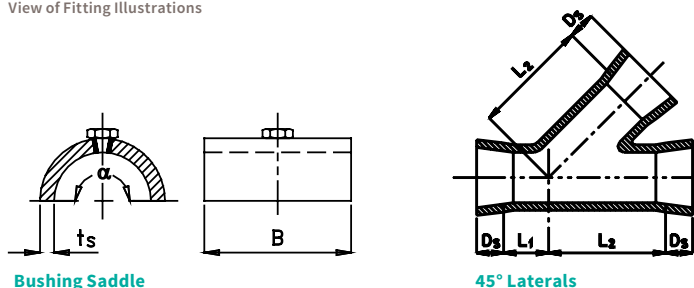
⁽¹⁾ Consult NOV Fiber Glass Systems for other material types or other sized bushings. For higher pressures, above 16.0/12 bar, contact NOV Fiber Glass Systems.

45° Laterals

Filament-wound 45° laterals with integral Quick-Lock (2-6 inch) or Taper/Taper (8-16 inch) socket ends, for adhesive bonding.

| Nominal Pipe Size | | Laying Length (LL1) | | Overall Length (OL1) | | Laying Length (LL2) | | Overall Length (OL2) | | Maximum Working Pressure | | Average Weight | |
|-------------------|-----|---------------------|-------|----------------------|-------|---------------------|-------|----------------------|-------|--------------------------|------|----------------|------|
| in | mm | in | mm | in | mm | in | mm | in | mm | psi | bar | lb | kg |
| 2 | 50 | 2.5 | 64.0 | 4.3 | 110.0 | 8.0 | 203.0 | 9.8 | 249.0 | 249.5 | 17.2 | 3.5 | 1.6 |
| 3 | 80 | 3.0 | 76.0 | 4.8 | 122.0 | 10.0 | 254.0 | 11.8 | 300.0 | 249.5 | 17.2 | 6.6 | 3.0 |
| 4 | 100 | 3.0 | 76.0 | 4.8 | 122.0 | 12.0 | 305.0 | 13.8 | 351.0 | 249.5 | 17.2 | 8.6 | 3.9 |
| 5 | 125 | 3.5 | 89.0 | 5.7 | 146.0 | 13.3 | 337.0 | 15.5 | 394.0 | 249.5 | 17.2 | 12.8 | 5.8 |
| 6 | 150 | 3.5 | 89.0 | 5.7 | 146.0 | 14.5 | 368.0 | 16.7 | 425.0 | 249.5 | 17.2 | 15.0 | 6.8 |
| 8 | 200 | 4.9 | 124.0 | 7.4 | 189.0 | 17.9 | 455.0 | 20.5 | 520.0 | 249.5 | 17.2 | 26.4 | 12.0 |
| 10 | 250 | 5.4 | 137.0 | 8.5 | 217.0 | 20.9 | 531.0 | 24.1 | 611.0 | 174.0 | 12.0 | 46.3 | 21.0 |
| 12 | 300 | 6.3 | 159.0 | 10.0 | 254.0 | 25.2 | 641.0 | 29.0 | 736.0 | 174.0 | 12.0 | 66.1 | 30.0 |
| 14 | 350 | 5.9 | 150.0 | 9.8 | 250.0 | 24.9 | 632.0 | 28.8 | 732.0 | 174.0 | 12.0 | 85.9 | 39.0 |
| 16 | 400 | 5.9 | 150.0 | 10.2 | 260.0 | 24.9 | 632.0 | 29.2 | 742.0 | 174.0 | 12.0 | 118.9 | 54.0 |

View of Fitting Illustrations



Bushing Saddle

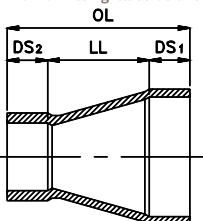
45° Laterals

Concentric Reducers

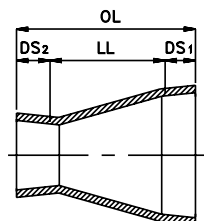
Filament-wound concentric reducers with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends, for adhesive bonding.

| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Maximum Working Pressure | | Average Weight | |
|-------------------|---------|--------------------|-----|---------------------|------|--------------------------|------|----------------|------|
| in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1.5x1 | 40x25 | 1.3 | 32 | 3.6 | 91 | 249.5 | 17.2 | 0.4 | 0.2 |
| 2x1 | 50x25 | 2.5 | 64 | 5.4 | 137 | 249.5 | 17.2 | 0.7 | 0.3 |
| 2x1.5 | 50x40 | 1.3 | 32 | 4.3 | 110 | 249.5 | 17.2 | 1.1 | 0.5 |
| 3x1.5 | 80x40 | 3.0 | 76 | 6.1 | 154 | 249.5 | 17.2 | 1.1 | 0.5 |
| 3x2 | 80x50 | 2.1 | 54 | 5.7 | 146 | 249.5 | 17.2 | 1.1 | 0.5 |
| 4x2 | 100x50 | 3.0 | 76 | 6.6 | 168 | 249.5 | 17.2 | 2.4 | 1.1 |
| 4x3 | 100x80 | 2.9 | 73 | 6.5 | 165 | 249.5 | 17.2 | 2.0 | 0.9 |
| 5x3 | 125x80 | 2.9 | 74 | 7.0 | 177 | 249.5 | 17.2 | 3.1 | 1.4 |
| 5x4 | 125x100 | 2.9 | 74 | 7.0 | 177 | 249.5 | 17.2 | 3.3 | 1.5 |
| 6x3 | 150x80 | 3.8 | 97 | 7.9 | 200 | 249.5 | 17.2 | 4.0 | 1.8 |
| 6x4 | 150x100 | 3.7 | 94 | 7.8 | 197 | 249.5 | 17.2 | 4.0 | 1.8 |
| 6x5 | 150x125 | 4.3 | 110 | 8.8 | 224 | 249.5 | 17.2 | 4.0 | 1.8 |
| 8x4 | 200x100 | 6.0 | 153 | 10.4 | 264 | 249.5 | 17.2 | 6.4 | 2.9 |
| 8x6 | 200x150 | 4.7 | 119 | 9.5 | 241 | 249.5 | 17.2 | 5.9 | 2.7 |
| 10x6 | 250x150 | 5.4 | 138 | 10.8 | 275 | 249.5 | 17.2 | 8.1 | 3.7 |
| 10x8 | 250x200 | 5.3 | 135 | 11.0 | 280 | 249.5 | 17.2 | 7.9 | 3.6 |
| 12x8 | 300x200 | 7.4 | 189 | 13.7 | 349 | 249.5 | 17.2 | 11.0 | 5.0 |
| 12x10 | 300x250 | 6.9 | 176 | 13.8 | 351 | 249.5 | 17.2 | 10.1 | 4.6 |
| 14x10 | 350x250 | 8.4 | 214 | 15.5 | 394 | 249.5 | 17.2 | 15.9 | 7.2 |
| 14x12 | 350x300 | 8.5 | 217 | 16.2 | 412 | 249.5 | 17.2 | 16.1 | 7.3 |
| 16x12 | 400x300 | 8.0 | 204 | 16.1 | 409 | 249.5 | 17.2 | 19.6 | 8.9 |
| 16x14 | 400x350 | 7.2 | 183 | 15.5 | 393 | 249.5 | 17.2 | 19.8 | 9.0 |
| 18x16 | 450x400 | 4.4 | 113 | 13.3 | 337 | 232.1 | 16.0 | 28.0 | 12.7 |
| 20x16 | 500x400 | 9.3 | 235 | 18.6 | 472 | 232.1 | 16.0 | 50.7 | 23.0 |
| 20x18 | 500x450 | 4.8 | 123 | 14.3 | 364 | 232.1 | 16.0 | 41.6 | 18.9 |
| 22x16 | 550x400 | 13.4 | 340 | 23.7 | 602 | 232.1 | 16.0 | 79.3 | 36.0 |
| 22x18 | 550x450 | 9.0 | 228 | 19.4 | 494 | 232.1 | 16.0 | 70.5 | 32.0 |
| 22x20 | 550x500 | 4.2 | 106 | 15.2 | 385 | 232.1 | 16.0 | 63.9 | 29.0 |
| 24x16 | 600x400 | 18.2 | 463 | 29.6 | 751 | 232.1 | 16.0 | 105.7 | 48.0 |
| 24x18 | 600x450 | 13.9 | 353 | 25.4 | 645 | 232.1 | 16.0 | 96.9 | 44.0 |
| 24x20 | 600x500 | 9.1 | 230 | 21.1 | 535 | 232.1 | 16.0 | 85.9 | 39.0 |
| 24x22 | 600x550 | 5.0 | 126 | 18.0 | 456 | 232.1 | 16.0 | 79.3 | 36.0 |
| 26x18 | 650x450 | 20.9 | 532 | 32.4 | 824 | 232.1 | 16.0 | 165.2 | 75.0 |
| 26x20 | 650x500 | 16.3 | 413 | 28.3 | 718 | 232.1 | 16.0 | 149.8 | 68.0 |
| 26x22 | 650x550 | 12.1 | 307 | 25.1 | 637 | 232.1 | 16.0 | 138.8 | 63.0 |
| 26x24 | 650x600 | 7.2 | 182 | 21.2 | 538 | 232.1 | 16.0 | 121.1 | 55.0 |
| 28x16 | 700x400 | 30.5 | 775 | 41.9 | 1063 | 232.1 | 16.0 | 174.0 | 79.0 |
| 28x18 | 700x450 | 26.0 | 661 | 37.5 | 953 | 232.1 | 16.0 | 163.0 | 74.0 |
| 28x20 | 700x500 | 21.3 | 542 | 33.3 | 847 | 232.1 | 16.0 | 152.0 | 69.0 |
| 28x24 | 700x600 | 12.2 | 311 | 26.3 | 667 | 232.1 | 16.0 | 147.6 | 67.0 |

View of Fitting Illustrations



Concentric Reducer Quick-Lock



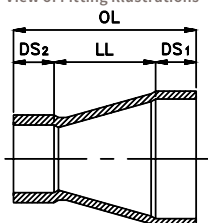
Concentric Reducer Taper/Taper

Concentric Reducers

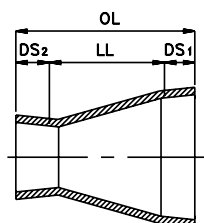
Filament-wound concentric reducers with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends, for adhesive bonding.

| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Maximum Working Pressure | | Average Weight | |
|-------------------|----------|--------------------|------|---------------------|------|--------------------------|------|----------------|-------|
| in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 30x16 | 750x400 | 34.9 | 886 | 46.2 | 1174 | 232.1 | 16.0 | 246.7 | 112.0 |
| 30x18 | 750x450 | 30.5 | 775 | 42.0 | 1067 | 232.1 | 16.0 | 235.7 | 107.0 |
| 30x20 | 750x500 | 25.7 | 653 | 37.7 | 958 | 232.1 | 16.0 | 220.3 | 100.0 |
| 30x24 | 750x600 | 16.6 | 422 | 30.6 | 778 | 232.1 | 16.0 | 191.6 | 87.0 |
| 30x26 | 750x650 | 9.4 | 240 | 23.5 | 596 | 232.1 | 16.0 | 158.6 | 72.0 |
| 30x28 | 750x700 | 4.4 | 111 | 18.4 | 467 | 232.1 | 16.0 | 125.6 | 57.0 |
| 32x18 | 800x450 | 36.2 | 920 | 47.7 | 1212 | 232.1 | 16.0 | 275.3 | 125.0 |
| 32x20 | 800x500 | 31.4 | 798 | 43.4 | 1103 | 232.1 | 16.0 | 240.1 | 109.0 |
| 32x24 | 800x600 | 22.4 | 570 | 36.5 | 926 | 232.1 | 16.0 | 207.0 | 94.0 |
| 32x28 | 800x700 | 10.2 | 259 | 24.2 | 615 | 232.1 | 16.0 | 180.6 | 82.0 |
| 32x30 | 800x750 | 5.8 | 148 | 19.8 | 504 | 232.1 | 16.0 | 156.4 | 71.0 |
| 36x20 | 900x500 | 40.5 | 1029 | 53.5 | 1359 | 232.1 | 16.0 | 462.6 | 210.0 |
| 36x24 | 900x600 | 31.5 | 799 | 46.5 | 1180 | 232.1 | 16.0 | 387.7 | 176.0 |
| 36x28 | 900x700 | 19.2 | 487 | 34.2 | 868 | 232.1 | 16.0 | 308.4 | 140.0 |
| 36x30 | 900x750 | 14.8 | 375 | 29.8 | 756 | 232.1 | 16.0 | 277.5 | 126.0 |
| 40x36 | 1000x900 | 12.2 | 310 | 32.8 | 833 | 232.1 | 16.0 | 400.9 | 182.0 |

View of Fitting Illustrations



Concentric Reducer
Quick-Lock



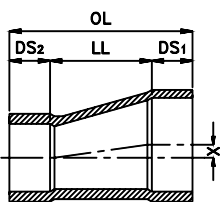
Concentric Reducer
Taper/Taper

Eccentric Reducers

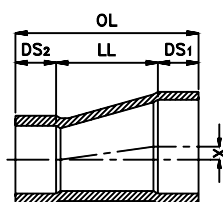
Filament-wound concentric reducers with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends, for adhesive bonding.

| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Eccentricity (X) | | Maximum Working Pressure | | Average Weight | |
|-------------------|----------|--------------------|-----|---------------------|------|------------------|-----|--------------------------|------|----------------|-------|
| in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1.5x1 | 40x25 | 2.2 | 56 | 4.5 | 115 | 0.3 | 7 | 249.5 | 17.2 | 0.4 | 0.2 |
| 2x1 | 50x25 | 3.9 | 100 | 6.8 | 173 | 0.5 | 13 | 249.5 | 17.2 | 0.7 | 0.3 |
| 2x1.5 | 50x40 | 1.7 | 44 | 4.8 | 122 | 0.2 | 6 | 249.5 | 17.2 | 1.1 | 0.5 |
| 3x1.5 | 80x40 | 5.9 | 150 | 9.0 | 228 | 0.8 | 20 | 249.5 | 17.2 | 1.1 | 0.5 |
| 3x2 | 80x50 | 4.3 | 108 | 7.9 | 200 | 0.6 | 14 | 249.5 | 17.2 | 1.1 | 0.5 |
| 4x2 | 100x50 | 7.9 | 200 | 11.5 | 292 | 1.1 | 27 | 249.5 | 17.2 | 2.4 | 1.1 |
| 4x3 | 100x80 | 3.7 | 93 | 7.3 | 185 | 0.5 | 12 | 249.5 | 17.2 | 2.0 | 0.9 |
| 5x4 | 125x100 | 4.0 | 101 | 8.0 | 204 | 0.6 | 14 | 249.5 | 17.2 | 3.3 | 1.5 |
| 6x3 | 150x80 | 11.5 | 293 | 15.6 | 396 | 1.5 | 39 | 249.5 | 17.2 | 4.0 | 1.8 |
| 6x4 | 150x100 | 7.9 | 200 | 11.9 | 303 | 1.1 | 27 | 249.5 | 17.2 | 4.0 | 1.8 |
| 6x5 | 150x125 | 3.9 | 100 | 8.4 | 214 | 0.5 | 13 | 249.5 | 17.2 | 4.0 | 1.8 |
| 8x4 | 200x100 | 15.9 | 405 | 20.3 | 516 | 2.0 | 52 | 249.5 | 17.2 | 6.4 | 2.9 |
| 8x6 | 200x150 | 8.1 | 205 | 12.9 | 327 | 1.0 | 25 | 249.5 | 17.2 | 5.9 | 2.7 |
| 10x6 | 250x150 | 16.1 | 410 | 21.5 | 547 | 2.1 | 53 | 249.5 | 17.2 | 8.1 | 3.7 |
| 10x8 | 250x200 | 9.3 | 235 | 15.0 | 380 | 1.1 | 27 | 249.5 | 17.2 | 7.9 | 3.6 |
| 12x8 | 300x200 | 16.9 | 429 | 23.2 | 589 | 2.1 | 53 | 249.5 | 17.2 | 11.0 | 5.0 |
| 12x10 | 300x250 | 9.0 | 229 | 15.9 | 404 | 1.0 | 26 | 249.5 | 17.2 | 10.1 | 4.6 |
| 14x10 | 350x250 | 13.4 | 340 | 20.5 | 520 | 1.7 | 42 | 249.5 | 17.2 | 15.9 | 7.2 |
| 14x12 | 350x300 | 6.3 | 159 | 13.9 | 354 | 0.6 | 16 | 249.5 | 17.2 | 16.1 | 7.3 |
| 16x12 | 400x300 | 13.5 | 344 | 21.6 | 549 | 1.6 | 41 | 249.5 | 17.2 | 19.6 | 8.9 |
| 16x14 | 400x350 | 8.5 | 215 | 16.7 | 425 | 1.0 | 25 | 249.5 | 17.2 | 19.8 | 9.0 |
| 18x12 | 450x300 | 17.7 | 450 | 25.2 | 640 | 2.5 | 63 | 232.1 | 16.0 | 34.4 | 15.6 |
| 18x14 | 450x350 | 12.7 | 322 | 20.7 | 525 | 1.7 | 43 | 232.1 | 16.0 | 31.3 | 14.2 |
| 18x16 | 450x400 | 7.8 | 197 | 16.3 | 413 | 0.7 | 18 | 232.1 | 16.0 | 28.0 | 12.7 |
| 20x16 | 500x400 | 12.8 | 324 | 21.8 | 553 | 1.5 | 39 | 232.1 | 16.0 | 50.7 | 23.0 |
| 20x18 | 500x450 | 7.8 | 197 | 17.2 | 438 | 0.9 | 22 | 232.1 | 16.0 | 41.6 | 18.9 |
| 24x16 | 600x400 | 22.8 | 580 | 33.9 | 860 | 3.7 | 93 | 232.1 | 16.0 | 105.7 | 48.0 |
| 24x18 | 600x450 | 17.7 | 450 | 29.2 | 742 | 2.9 | 73 | 232.1 | 16.0 | 96.9 | 44.0 |
| 24x20 | 600x500 | 12.8 | 325 | 24.8 | 630 | 1.9 | 48 | 232.1 | 16.0 | 85.9 | 39.0 |
| 30x24 | 750x400 | 17.8 | 451 | 31.8 | 807 | 3.4 | 86 | 232.1 | 16.0 | 191.6 | 87.0 |
| 36x24 | 900x400 | 32.8 | 832 | 47.8 | 1213 | 6.3 | 161 | 232.1 | 16.0 | 387.7 | 176.0 |
| 40x32 | 1000x800 | 29.1 | 739 | 48.7 | 1237 | 3.9 | 100 | 232.1 | 16.0 | 400.9 | 182.0 |
| 40x36 | 1000x900 | 16.5 | 419 | 37.1 | 942 | 2.0 | 52 | 232.1 | 16.0 | 422.9 | 192.0 |

View of Fitting Illustrations



Eccentric Quick-Lock



Eccentric Taper/Taper

Couplings

Filament-wound couplings with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends, for adhesive bonding.

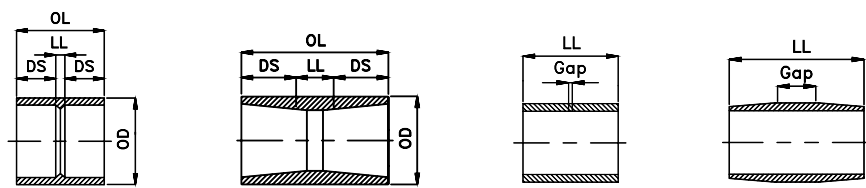
| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Outside Diameter (OD) | | Maximum Working Pressure | | Average Weight | |
|-------------------|------|--------------------|----|---------------------|-----|-----------------------|------|--------------------------|------|----------------|------|
| in | mm | in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1 | 25 | 0.4 | 9 | 2.5 | 63 | 1.7 | 42 | 249.5 | 17.2 | 0.2 | 0.1 |
| 1.5 | 40 | 0.4 | 9 | 2.9 | 73 | 2.3 | 58 | 249.5 | 17.2 | 0.2 | 0.1 |
| 2 | 50 | 0.4 | 9 | 4.0 | 101 | 3.1 | 79 | 249.5 | 17.2 | 0.7 | 0.3 |
| 3 | 80 | 0.4 | 9 | 4.0 | 101 | 4.3 | 108 | 249.5 | 17.2 | 0.9 | 0.4 |
| 4 | 100 | 0.4 | 9 | 4.0 | 101 | 5.2 | 133 | 249.5 | 17.2 | 1.3 | 0.6 |
| 5 | 125 | 0.4 | 9 | 4.8 | 123 | 6.0 | 153 | 249.5 | 17.2 | 2.0 | 0.9 |
| 6 | 150 | 0.4 | 9 | 4.8 | 123 | 7.2 | 183 | 249.5 | 17.2 | 2.4 | 1.1 |
| 8 | 200 | 2.8 | 70 | 7.9 | 200 | 9.1 | 230 | 249.5 | 17.2 | 3.7 | 1.7 |
| 10 | 250 | 2.8 | 70 | 9.1 | 230 | 11.4 | 289 | 249.5 | 17.2 | 5.1 | 2.3 |
| 12 | 300 | 2.8 | 70 | 10.2 | 260 | 13.8 | 350 | 249.5 | 17.2 | 6.2 | 2.8 |
| 14 | 350 | 2.8 | 70 | 10.6 | 270 | 14.8 | 377 | 249.5 | 17.2 | 10.1 | 4.6 |
| 16 | 400 | 2.8 | 70 | 11.4 | 290 | 16.9 | 430 | 249.5 | 17.2 | 15.9 | 7.2 |
| 18 | 450 | 2.8 | 70 | 11.7 | 298 | 18.2 | 463 | 232.1 | 16.0 | 23.6 | 10.7 |
| 20 | 500 | 2.8 | 70 | 12.8 | 324 | 20.2 | 514 | 232.1 | 16.0 | 28.6 | 13.0 |
| 22 | 550 | 2.8 | 70 | 14.7 | 374 | | | 232.1 | 16.0 | 34.4 | 15.6 |
| 24 | 600 | 2.8 | 70 | 16.8 | 426 | 24.3 | 618 | 232.1 | 16.0 | 41.4 | 18.8 |
| 26 | 650 | 2.8 | 70 | 16.8 | 426 | | | 232.1 | 16.0 | 46.3 | 21.0 |
| 28 | 700 | 2.8 | 70 | 16.8 | 426 | 29.2 | 742 | 232.1 | 16.0 | 52.9 | 24.0 |
| 30 | 750 | 2.8 | 70 | 16.8 | 426 | 31.3 | 795 | 232.1 | 16.0 | 55.1 | 25.0 |
| 32 | 800 | 2.8 | 70 | 16.8 | 426 | 33.4 | 848 | 232.1 | 16.0 | 59.5 | 27.0 |
| 36 | 900 | 2.8 | 70 | 18.7 | 476 | 37.4 | 950 | 232.1 | 16.0 | 77.1 | 35.0 |
| 40 | 1000 | 2.8 | 70 | 28.0 | 710 | 41.6 | 1057 | 232.1 | 16.0 | 90.3 | 41.0 |

Nipples

Filament-wound nipples with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) male ends, for adhesive bonding.

| Nominal Pipe Size | | Laying Length (LL) | | Gap ⁽¹⁾ | | Maximum Working Pressure | | Average Weight | |
|-------------------|------|--------------------|-----|--------------------|----|--------------------------|------|----------------|------|
| in | mm | in | mm | in | mm | psi | bar | lbs | kg |
| 1 | 25 | 2.2 | 57 | 0.1 | 3 | 249.5 | 17.2 | 0.2 | 0.1 |
| 1.5 | 40 | 2.6 | 67 | 0.1 | 3 | 249.5 | 17.2 | 0.2 | 0.1 |
| 2 | 50 | 3.7 | 95 | 0.1 | 3 | 249.5 | 17.2 | 0.2 | 0.1 |
| 3 | 80 | 3.7 | 95 | 0.1 | 3 | 249.5 | 17.2 | 0.2 | 0.1 |
| 4 | 100 | 3.7 | 95 | 0.1 | 3 | 249.5 | 17.2 | 0.4 | 0.2 |
| 5 | 125 | 4.6 | 117 | 0.1 | 3 | 249.5 | 17.2 | 0.7 | 0.3 |
| 6 | 150 | 4.6 | 117 | 0.1 | 3 | 249.5 | 17.2 | 0.9 | 0.4 |
| 8 | 200 | 6.3 | 160 | 1.2 | 30 | 249.5 | 17.2 | 1.3 | 0.6 |
| 10 | 250 | 7.5 | 190 | 1.2 | 30 | 249.5 | 17.2 | 2.0 | 0.9 |
| 12 | 300 | 9.1 | 230 | 1.6 | 40 | 249.5 | 17.2 | 2.4 | 1.1 |
| 14 | 350 | 9.4 | 240 | 1.6 | 40 | 249.5 | 17.2 | 6.8 | 3.1 |
| 16 | 400 | 10.2 | 260 | 1.6 | 40 | 249.5 | 17.2 | 9.7 | 4.4 |
| 18 | 450 | 10.9 | 278 | 2.0 | 50 | 232.1 | 16.0 | 13.0 | 5.9 |
| 20 | 500 | 12.0 | 304 | 2.0 | 50 | 232.1 | 16.0 | 17.2 | 7.8 |
| 22 | 550 | 13.9 | 354 | 2.0 | 50 | 232.1 | 16.0 | 21.6 | 9.8 |
| 24 | 600 | 16.0 | 406 | 2.0 | 50 | 232.1 | 16.0 | 26.4 | 12.0 |
| 26 | 650 | 16.0 | 406 | 2.0 | 50 | 232.1 | 16.0 | 41.6 | 18.9 |
| 28 | 700 | 16.0 | 406 | 2.0 | 50 | 232.1 | 16.0 | 46.3 | 21.0 |
| 30 | 750 | 16.0 | 406 | 2.0 | 50 | 232.1 | 16.0 | 48.5 | 22.0 |
| 32 | 800 | 16.0 | 406 | 2.0 | 50 | 232.1 | 16.0 | 52.9 | 24.0 |
| 36 | 900 | 18.0 | 456 | 2.0 | 50 | 232.1 | 16.0 | 79.3 | 36.0 |
| 40 | 1000 | 27.2 | 690 | 2.0 | 50 | 232.1 | 16.0 | 112.3 | 51.0 |

View of Fitting Illustrations



Coupling Quick-Lock

Coupling Taper/Taper

Nipple Quick-Lock

Nipple Taper/Taper

Support Saddles

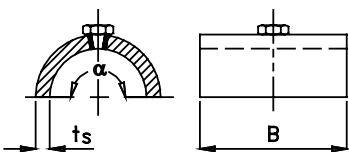
Filament-wound pipe saddles for wear, support and anchor.

| Nominal Pipe Size | | Saddles Angle (a) | Saddle Thickness (t _s) | | Saddle Weight (B=100 mm) | | Required Adhesive Kits | | Saddle Weight (B=150 mm) | | Required Adhesive Kits | |
|-------------------|------|-------------------|------------------------------------|----|--------------------------|-----|------------------------|------|--------------------------|-----|------------------------|------|
| in | mm | angle | in | mm | lb | kg | 3 oz | 6 oz | lb | kg | 3 oz | 6 oz |
| 1 | 25 | 180 | 0.6 | 14 | 0.4 | 0.2 | 1 | - | 0.7 | 0.3 | 1 | - |
| 1½ | 40 | 180 | 0.6 | 14 | 0.7 | 0.3 | 1 | - | 1.1 | 0.5 | 1 | - |
| 2 | 50 | 180 | 0.6 | 14 | 0.9 | 0.4 | 1 | - | 1.3 | 0.6 | 1 | - |
| 3 | 80 | 180 | 0.6 | 14 | 1.1 | 0.5 | 1 | - | 1.8 | 0.8 | - | 1 |
| 4 | 100 | 180 | 0.6 | 14 | 1.5 | 0.7 | 1 | - | 2.4 | 1.1 | - | 1 |
| 5 | 125 | 180 | 0.6 | 14 | 1.8 | 0.8 | - | 1 | 2.6 | 1.2 | - | 1 |
| 6 | 150 | 180 | 0.6 | 14 | 2.0 | 0.9 | - | 1 | 3.1 | 1.4 | - | 2 |
| 8 | 200 | 180 | 0.6 | 14 | 2.4 | 1.1 | - | 1 | 3.7 | 1.7 | - | 2 |
| 10 | 250 | 180 | 0.6 | 14 | 3.3 | 1.5 | - | 2 | 5.1 | 2.3 | - | 2 |
| 12 | 300 | 180 | 0.6 | 14 | 4.0 | 1.8 | - | 2 | 5.9 | 2.7 | - | 3 |
| 14 | 350 | 180 | 0.6 | 14 | 4.4 | 2.0 | - | 2 | 6.6 | 3.0 | - | 3 |
| 16 | 400 | 180 | 0.6 | 14 | 5.3 | 2.4 | - | 2 | 7.9 | 3.6 | - | 3 |
| 18 | 450 | 180 | 0.6 | 16 | - | - | - | - | 7.0 | 3.2 | - | 2 |
| 20 | 500 | 180 | 0.6 | 16 | - | - | - | - | 7.9 | 3.6 | - | 2 |
| 22 | 550 | 180 | 0.6 | 16 | - | - | - | - | 9.0 | 4.1 | - | - |
| 24 | 600 | 180 | 0.6 | 16 | - | - | - | - | 9.5 | 4.3 | - | 2 |
| 26 | 650 | 180 | 0.6 | 16 | - | - | - | - | 10.6 | 4.8 | - | - |
| 28 | 700 | 180 | 0.6 | 16 | - | - | - | - | 11.2 | 5.1 | - | 3 |
| 30 | 750 | 180 | 0.6 | 16 | - | - | - | - | 12.1 | 5.5 | - | 3 |
| 32 | 800 | 180 | 0.6 | 16 | - | - | - | - | 12.8 | 5.8 | - | 3 |
| 36 | 900 | 180 | 0.6 | 16 | - | - | - | - | 14.3 | 6.5 | - | 4 |
| 40 | 1000 | 180 | 0.6 | 16 | - | - | - | - | 18.1 | 8.2 | - | 4 |

NOTES:

- Filament-wound support saddles are intended for protection of pipe at supports and clamps, as well as for anchoring purposes. Support and anchor saddles are standard 180° sweeps. Saddles are supplied in standard lengths of 100 mm and 150 mm.
- For special saddle lengths, thickness and/or sweep angles contact NOV Fiber Glass Systems.
- Wear saddles are standard 90°. Weights of 90° sweep saddles are 50% of value shown.

View of Fitting Illustrations



Support Saddles

Grounding Saddles

Filament-wound pipe saddles for grounding in conductive piping systems.

| Nominal Pipe Size | | Saddles Angle (a) | Saddle Length (B) | | Saddle Thickness (t _s) | | Average Saddle Weight | | Adhesive Kits |
|-------------------|------|-------------------|-------------------|----|------------------------------------|----|-----------------------|-----|---------------|
| in | mm | angle | in | mm | in | mm | lb | kg | 3 oz |
| 1 | 25 | 90 | 3.0 | 76 | 0.6 | 14 | 0.2 | 0.1 | 1 |
| 1.5 | 40 | 90 | 3.0 | 76 | 0.6 | 14 | 0.2 | 0.1 | 1 |
| 2 | 50 | 90 | 3.0 | 76 | 0.6 | 14 | 0.2 | 0.1 | 1 |
| 3 | 80 | 90 | 3.0 | 76 | 0.6 | 14 | 0.2 | 0.1 | 1 |
| 4 | 100 | 90 | 3.0 | 76 | 0.6 | 14 | 0.4 | 0.2 | 1 |
| 5 | 125 | 90 | 3.0 | 76 | 0.6 | 14 | 0.7 | 0.3 | 1 |
| 6 | 150 | 90 | 3.0 | 76 | 0.6 | 14 | 0.7 | 0.3 | 1 |
| 8 | 200 | 45 | 3.0 | 76 | 0.6 | 14 | 0.4 | 0.2 | 1 |
| 10 | 250 | 45 | 3.0 | 76 | 0.6 | 14 | 0.4 | 0.2 | 1 |
| 12 | 300 | 45 | 3.0 | 76 | 0.6 | 14 | 0.4 | 0.2 | 1 |
| 14 | 350 | 45 | 3.0 | 76 | 0.6 | 14 | 0.7 | 0.3 | 1 |
| 16 | 400 | 45 | 3.0 | 76 | 0.6 | 14 | 0.7 | 0.3 | 1 |
| 18 | 450 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.4 | 0.2 | 1 |
| 20 | 500 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.4 | 0.2 | 1 |
| 22 | 550 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.7 | 0.3 | 1 |
| 24 | 600 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.7 | 0.3 | 1 |
| 26 | 650 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.7 | 0.3 | 1 |
| 28 | 700 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.7 | 0.3 | 2 |
| 30 | 750 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.9 | 0.4 | 2 |
| 32 | 800 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.9 | 0.4 | 3 |
| 36 | 900 | 22.5 | 3.0 | 76 | 0.6 | 16 | 0.9 | 0.4 | 3 |
| 40 | 1000 | 22.5 | 3.0 | 76 | 0.6 | 16 | 1.1 | 0.5 | 3 |

NOTES:

1. Bondstrand conductive adhesive should be used for mounting onto pipe.
2. Saddles are supplied with a 600 mm length of stainless steel cable.

Bell Mouths⁽¹⁾

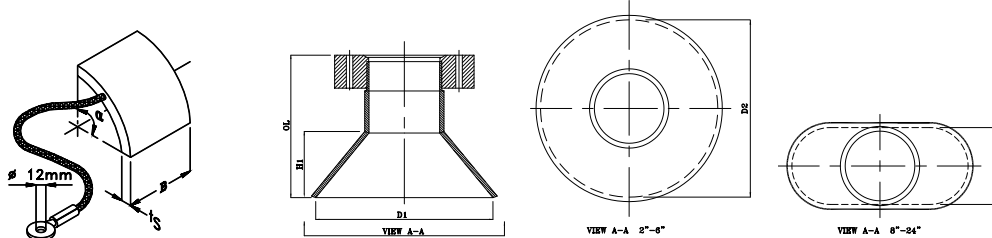
Filament-wound bell mouths with adhesive-bonded HD-flange.

| Nominal Pipe Size | | Overall Length (OL) | | Length of Bell Mouth (H1) | | Internal Diameter (D1) | | Internal Diameter (D2) | | Average Weight ⁽¹⁾ | |
|-------------------|-----|---------------------|-----|---------------------------|-----|------------------------|------|------------------------|-----|-------------------------------|-------|
| in | mm | in | mm | in | mm | in | mm | in | mm | lb | kg |
| 2 | 50 | 10.6 | 269 | 4.5 | 115 | 4.3 | 110 | 4.3 | 110 | 6.8 | 3.1 |
| 3 | 80 | 10.8 | 274 | 4.7 | 120 | 8.7 | 220 | 8.7 | 220 | 11.0 | 5.0 |
| 4 | 100 | 11.4 | 289 | 5.3 | 135 | 10.8 | 275 | 10.8 | 275 | 18.5 | 8.4 |
| 5 | 125 | 12.7 | 323 | 6.2 | 158 | 15.7 | 400 | 15.7 | 400 | 28.0 | 12.7 |
| 6 | 150 | 12.8 | 324 | 6.2 | 158 | 17.7 | 450 | 17.7 | 450 | 32.4 | 14.7 |
| 8 | 200 | 21.0 | 534 | 13.4 | 340 | 29.5 | 750 | 17.7 | 450 | 57.3 | 26.0 |
| 10 | 250 | 23.8 | 604 | 15.6 | 395 | 33.5 | 850 | 21.7 | 550 | 85.9 | 39.0 |
| 12 | 300 | 23.1 | 588 | 14.4 | 365 | 33.5 | 850 | 21.7 | 550 | 112.3 | 51.0 |
| 14 | 350 | 24.3 | 616 | 14.8 | 375 | 33.5 | 850 | 21.7 | 550 | 132.2 | 60.0 |
| 16 | 400 | 23.5 | 596 | 13.6 | 345 | 33.5 | 850 | 21.7 | 550 | 147.6 | 67.0 |
| 18 | 450 | 25.0 | 635 | 14.2 | 360 | 35.4 | 900 | 23.6 | 600 | 198.2 | 90.0 |
| 20 | 500 | 29.1 | 738 | 17.7 | 450 | 43.3 | 1100 | 23.6 | 600 | 262.1 | 119.0 |
| 24 | 600 | 34.6 | 879 | 21.3 | 540 | 51.2 | 1300 | 27.6 | 700 | 376.7 | 171.0 |

NOTES:

1. For special shape or dimension bell mouths, contact NOV Fiber Glass Systems.
2. Weights provided are for bell mouth with CL150 flange.

View of Fitting Illustrations



Grounding Saddle

Bell Mouth

Expansion Coupling

Filament-wound Key-Lock expansion coupling with integral double O-ring Key-Lock female end one side and double O-ring female end on other side

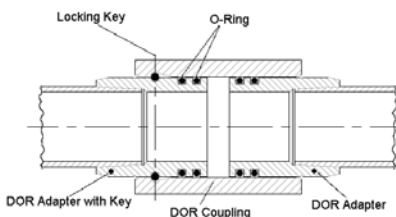
| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | O-ring Size | | Key Size | | Average Weight | |
|-------------------|------|--------------------|----|---------------------|-----|-------------|--------------|-------------|-----------|----------------|-------|
| in | mm | in | mm | in | mm | in | mm | in | mm | lb | kg |
| 2 | 50 | 2.0 | 50 | 8.7 | 222 | 0.3 x 2.4 | 7 x 59.7 | 0.2 x 12.0 | 6 x 305 | 2.9 | 1.3 |
| 3 | 80 | 2.0 | 50 | 8.7 | 222 | 0.3 x 3.5 | 7 x 88.3 | 0.2 x 15.7 | 6 x 400 | 3.7 | 1.7 |
| 4 | 100 | 2.0 | 50 | 8.7 | 222 | 0.3 x 4.5 | 7 x 113.7 | 0.2 x 19.0 | 6 x 483 | 7.7 | 3.5 |
| 5 | 125 | 2.0 | 50 | 10.4 | 264 | 0.4 x 5.3 | 9 x 135.0 | 0.3 x 22.8 | 8 x 580 | 10.1 | 4.6 |
| 6 | 150 | 2.0 | 50 | 10.6 | 270 | 0.4 x 6.4 | 10 x 161.3 | 0.3 x 26.0 | 8 x 660 | 14.5 | 6.6 |
| 8 | 200 | 2.0 | 50 | 13.3 | 339 | 0.4 x 8.9 | 10 x 225.5 | 0.4 x 33.1 | 10 x 840 | 33.9 | 15.4 |
| 10 | 250 | 2.0 | 50 | 14.8 | 376 | 0.5 x 11.9 | 12.5 x 302 | 0.5 x 50.0 | 12 x 1270 | 43.8 | 19.9 |
| 12 | 300 | 2.0 | 50 | 18.8 | 478 | 0.5 x 13.5 | 12.5 x 342.3 | 0.6 x 50.0 | 15 x 1270 | 46.3 | 21.0 |
| 14 | 350 | 2.0 | 50 | 17.8 | 452 | 0.5 x 13.5 | 12.5 x 342.3 | 0.6 x 53.5 | 15 x 1360 | 55.1 | 25.0 |
| 16 | 400 | 2.0 | 50 | 19.5 | 496 | 0.5 x 15.5 | 12.5 x 393.1 | 0.7 x 62.4 | 18 x 1585 | 70.5 | 32.0 |
| 18 | 450 | 2.0 | 50 | 16.4 | 416 | 0.6 x 17.5 | 15.0 x 445.0 | 0.6 x 68.9 | 15 x 1750 | 59.5 | 27.0 |
| 20 | 500 | 2.0 | 50 | 17.0 | 433 | 0.6 x 19.3 | 15.0 x 490.0 | 0.6 x 76.0 | 15 x 1930 | 70.5 | 32.0 |
| 22 | 550 | 2.0 | 50 | 18.9 | 480 | 0.7 x 21.9 | 18.0 x 556.0 | 0.7 x 82.7 | 18 x 2100 | 114.5 | 52.0 |
| 24 | 600 | 2.0 | 50 | 18.9 | 479 | 0.7 x 22.8 | 18.0 x 580.0 | 0.7 x 88.2 | 18 x 2240 | 114.5 | 52.0 |
| 26 | 650 | 2.0 | 50 | 21.8 | 554 | 0.7 x 24.5 | 18.0 x 622.3 | 0.7 x 98.8 | 18 x 2510 | 152.0 | 69.0 |
| 28 | 700 | 2.0 | 50 | 22.0 | 560 | 0.8 x 27.0 | 20.0 x 685.0 | 0.8 x 106.3 | 20 x 2700 | 169.6 | 77.0 |
| 30 | 750 | 2.0 | 50 | 22.6 | 574 | 0.8 x 29.1 | 20.0 x 740.0 | 0.8 x 106.3 | 20 x 2700 | 198.2 | 90.0 |
| 32 | 800 | 2.0 | 50 | 25.4 | 644 | 0.8 x 31.1 | 20.0 x 790.0 | 0.8 x 120.7 | 20 x 3065 | 253.3 | 115.0 |
| 36 | 900 | 2.0 | 50 | 29.7 | 754 | 1.0 x 35.0 | 25.0 x 890.0 | 1.0 x 125.0 | 25 x 3175 | 374.4 | 170.0 |
| 40 | 1000 | 2.0 | 50 | 29.1 | 740 | 1.0 x 38.9 | 26.0 x 987.0 | 0.8 x 137.8 | 20 x 3500 | 458.1 | 208.0 |

Key-Lock Adapter for Expansion Coupling

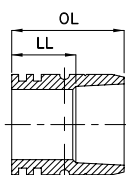
Filament-wound double O-ring male Key-Lock adapter with integral Quick-Lock (2-6 inch) or Taper/Taper (8-40 inch) socket end, for adhesive bonding

| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Average Weight | |
|-------------------|------|--------------------|-----|---------------------|-----|----------------|------|
| in | mm | in | mm | in | mm | lb | kg |
| 2 | 50 | 3.3 | 85 | 5.2 | 131 | 0.9 | 0.4 |
| 3 | 80 | 3.3 | 85 | 5.2 | 131 | 1.3 | 0.6 |
| 4 | 100 | 3.3 | 85 | 5.2 | 131 | 2.0 | 0.9 |
| 5 | 125 | 4.0 | 102 | 6.3 | 159 | 3.5 | 1.6 |
| 6 | 150 | 4.1 | 105 | 6.4 | 162 | 4.0 | 1.8 |
| 8 | 200 | 5.4 | 138 | 8.0 | 203 | 11.2 | 5.1 |
| 10 | 250 | 5.8 | 148 | 9.0 | 228 | 26.0 | 11.8 |
| 12 | 300 | 7.5 | 190 | 11.2 | 285 | 32.2 | 14.6 |
| 14 | 350 | 7.3 | 185 | 11.2 | 285 | 23.6 | 10.7 |
| 16 | 400 | 8.3 | 210 | 12.6 | 320 | 35.0 | 15.9 |
| 18 | 450 | 7.6 | 193 | 12.1 | 307 | 43.0 | 19.5 |
| 20 | 500 | 7.9 | 201 | 12.9 | 328 | 52.9 | 24.0 |
| 22 | 550 | 8.9 | 225 | 13.3 | 377 | 54.0 | 24.5 |
| 24 | 600 | 8.8 | 224 | 15.8 | 402 | 55.1 | 25.0 |
| 26 | 650 | 10.3 | 262 | 17.3 | 440 | 59.5 | 27.0 |
| 28 | 700 | 10.4 | 265 | 17.4 | 443 | 63.9 | 29.0 |
| 30 | 750 | 10.7 | 272 | 17.7 | 450 | 74.9 | 34.0 |
| 32 | 800 | 12.1 | 307 | 19.1 | 485 | 92.5 | 42.0 |
| 36 | 900 | 14.3 | 362 | 22.2 | 565 | 110.1 | 50.0 |
| 40 | 1000 | 14.0 | 355 | 30.1 | 765 | 141.0 | 64.0 |

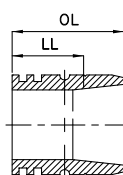
View of Fitting Illustrations



Double O-ring Expansion Joint



Key-Lock for Expansion Coupling Quick-Lock



Key-Lock for Expansion Coupling Taper/Taper

Double O-ring Adapter for Expansion Coupling

Filament-wound double O-ring adapter with integral Quick-Lock (1-6 inch) and Taper (8-40 inch) socket end, for adhesive bonding

| Nominal Pipe Size | | Laying Length (LL) | | Overall Length (OL) | | Average Weight | |
|-------------------|------|--------------------|-----|---------------------|-----|----------------|------|
| in | mm | in | mm | in | mm | lb | kg |
| 2 | 50 | 3.3 | 85 | 5.2 | 131 | 0.9 | 0.4 |
| 3 | 80 | 3.3 | 85 | 5.2 | 131 | 1.5 | 0.7 |
| 4 | 100 | 3.3 | 85 | 5.2 | 131 | 2.0 | 0.9 |
| 5 | 125 | 4.0 | 102 | 6.3 | 159 | 3.5 | 1.6 |
| 6 | 150 | 4.1 | 105 | 6.4 | 162 | 4.0 | 1.8 |
| 8 | 200 | 5.4 | 138 | 8.0 | 203 | 11.2 | 5.1 |
| 10 | 250 | 5.8 | 148 | 9.0 | 228 | 26.0 | 11.8 |
| 12 | 300 | 7.5 | 190 | 11.2 | 285 | 32.2 | 14.6 |
| 14 | 350 | 7.3 | 185 | 11.2 | 285 | 23.6 | 10.7 |
| 16 | 400 | 8.3 | 210 | 12.6 | 320 | 35.0 | 15.9 |
| 18 | 450 | 7.6 | 193 | 12.1 | 307 | 43.0 | 19.5 |
| 20 | 500 | 7.9 | 201 | 12.9 | 328 | 52.9 | 24.0 |
| 22 | 550 | 8.9 | 225 | 13.3 | 377 | 54.0 | 24.5 |
| 24 | 600 | 8.8 | 224 | 15.8 | 402 | 55.1 | 25.0 |
| 26 | 650 | 10.3 | 262 | 17.3 | 440 | 59.5 | 27.0 |
| 28 | 700 | 10.4 | 265 | 17.4 | 443 | 63.9 | 29.0 |
| 30 | 750 | 10.7 | 272 | 17.7 | 450 | 74.9 | 34.0 |
| 32 | 800 | 12.1 | 307 | 19.1 | 485 | 92.5 | 42.0 |
| 36 | 900 | 14.3 | 362 | 22.2 | 565 | 110.1 | 50.0 |
| 40 | 1000 | 14.0 | 355 | 30.1 | 765 | 141.0 | 64.0 |

Adhesive

Number of Adhesive Kits per joint

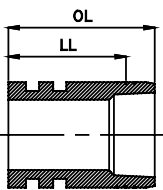
| Nominal Pipe Size | | Adhesive Volume | Required Adhesive Kits | Minimum # of Adhesive Kits required per Joint |
|-------------------|-----|-----------------|------------------------|---|
| in | mm | cm ³ | oz | number |
| 1 | 25 | 88.7 | 3 | 1/5 |
| 1½ | 40 | 88.7 | 3 | 1/5 |
| 2 | 50 | 88.7 | 3 | 1/4 |
| 3 | 80 | 88.7 | 3 | 1/3 |
| 4 | 100 | 88.7 | 3 | 1/2 |
| 5 | 125 | 88.7 | 3 | 1 |
| 6 | 150 | 88.7 | 3 | 1 |
| 8 | 200 | 88.7 | 3 | 1 |
| 10 | 250 | 177.4 | 6 | 1 |
| 12 | 300 | 177.4 | 6 | 1 |
| 14 | 350 | 177.4 | 6 | 2 |
| 16 | 400 | 177.4 | 6 | 2 |

| Nominal Pipe Size | | Adhesive Volume | Required Adhesive Kits | Minimum # of Adhesive Kits required per Joint |
|-------------------|------|-----------------|------------------------|---|
| in | mm | cm ³ | oz | number |
| 18 | 450 | 177.4 | 6 | 2 |
| 20 | 500 | 177.4 | 6 | 3 |
| 22 | 550 | 177.4 | 6 | 4 |
| 24 | 600 | 177.4 | 6 | 4 |
| 26 | 650 | 177.4 | 6 | 4 |
| 28 | 700 | 177.4 | 6 | 4 |
| 30 | 750 | 177.4 | 6 | 5 |
| 32 | 800 | 177.4 | 6 | 5 |
| 34 | 850 | 177.4 | 6 | 6 |
| 36 | 900 | 177.4 | 6 | 6 |
| 40 | 1000 | 177.4 | 6 | 7 |

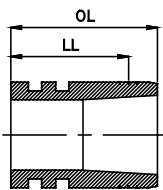
NOTES:

1. Adhesive Kits should never be split. If remainder is not used for other joints made at the same time then surplus must be discarded.
2. Required adhesive for saddles is shown in the dimension table of the respective saddles.
3. For type of adhesive to be used, please refer to the Bondstrand Corrosion Guide.

View of Fitting Illustrations



Double O-ring Adapter
Quick-Lock



Double O-ring Adapter
Taper/Taper

Typical Mechanical Properties

| Pipe Properties | Units | 70°F | 21°C | 200°F | 93°C | Method |
|---|-------------------|------------------------|--------------------|------------------------|--------|------------------------------|
| Hydrostatic Design Basis | N/mm ² | 23,351 | 161 ⁽¹⁾ | 17,549 | 121 | ASTM D2992, Proc. B (20 yrs) |
| Ultimate Hoop Stress at Weeping | N/mm ² | 40,610 | 280 | 48,442 | 334 | ASTM D1599 |
| Circumferential | | | | | | |
| Hoop tensile strength | N/mm ² | 55,114 | 380 | - | - | ASTM D2290 |
| Hoop tensile modulus | N/mm ² | 3.87 x 10 ⁶ | 26,700 | 2.36 x 10 ⁶ | 16,300 | ASTM D2290 |
| Poisson's Ratio ν_{ha} ⁽²⁾ | - | 0.61 | | 0.80 | | NOV FGS |
| Longitudinal | | | | | | |
| Axial tensile strength | N/mm ² | 11,603 | 80 | 9,427 | 65 | ASTM D2105 |
| Axial strength modulus | N/mm ² | 2.24 x 10 ⁶ | 15,500 | 1.24 x 10 ⁶ | 8,550 | ASTM D2105 |
| Poisson's Ratio ν_{ha} ⁽³⁾ | - | 0.35 | | 0.42 | | ASTM D2105 |
| Axial bending strength | N/mm ² | 12,328 | 85 | - | - | NOV FGS |
| Axial bending modulus | N/mm ² | 2.24 x 10 ⁶ | 15,500 | 1.43 x 10 ⁶ | 9,900 | ASTM D2925 |
| Shear Modulus | N/mm ² | 1.75 x 10 ⁶ | 12,100 | 1.66 x 10 ⁶ | 11,500 | NOV FGS |

Typical Physical Properties

| Pipe Properties | Units | Value | Method |
|---|-------------------|------------------------|-----------|
| Thermal Conductivity Pipe Wall | W/m°C | 0.33 | NOV FGS |
| Thermal Expansion @ 21°C | mm/mm °C | 18 x 10 ⁻⁶ | ASTM D696 |
| Thermal Expansion @ 93°C | mm/mm °C | 24 x 10 ⁻⁶ | ASTM D696 |
| Flow Efficient, Hazen-Williams | - | 150 | - |
| Absolute Roughness⁽⁴⁾ | m | 5.3 x 10 ⁻⁶ | - |
| Density | kg/m ³ | 1,800 | - |
| Specific Gravity | - | 1.8 | ASTM D792 |
| Specific Heat | J/kg °C | 910 | - |
| Grounding Resistance @ 500 volts - pipe | Ohm/m | <1 x 10 ⁻⁶ | ASTM D257 |
| Grounding Resistance @ 500 volts - fitting | Ohm/pc | <1 x 10 ⁻⁶ | ASTM D257 |
| Shielding Capacity | Volt | 100 | - |

⁽¹⁾ Value obtained at 65°C

⁽²⁾ ν_{ha} = The ratio of axial strain to hoop strain resulting from stress in the hoop direction.

⁽³⁾ ν_{ah} = The ratio of hoop strain to axial strain resulting from stress in the axial direction.

⁽⁴⁾ Although friction loss is lower, maximum velocity is recommended no more than 4.6 m/s (1.5 ft/s) to avoid excess axial load on pipe support.

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