# *STAR™* Super Seal Line Pipe *(Low Pressure - API 15LR DESIGN - Product Data)*

## Product Description

- Pressure - Up to 450 psi (3,1 MPa) Static and 300 psi (2,1 MPa) Cyclic
- Resin System - Aliphatic Amine Cured Epoxy
- Reinforcement - Premium Fiberglass
- Joining Systems - Mechanical O-Ring (SSS HP)
- Joint Length - 30.5 Feet (9,3 mts)
  Random Lengths of 20 to 32 Feet (6,1 to 9,8 mts) depending on size
- Fittings - A variety of filament wound low pressure 2”-8” Bonded and 8”-12” SS threaded are available
- Temperature - Up to 200° F (93.3° C) Maximum
- Sizes - 2 through 12 inches

## Design Specifications (API 15LR)

- Design Life - 11.4 Years Cyclic
- Design Temperature - 150° F* (65.6° C)
- Wall Thickness - Minimum (Catalog Nominal)
- 100% Factory Hydrotest - All products are tested at a minimum of 1.25 x the series rated pressure of 150° F (65.6° C)
- Service Factor - 1 to 1
- Design Stress - LTHS
  ASTM 2992-A
  8,885 psi (61,3 MPa)

* 150° F Static values are interpolated

## Flow Factors

- Hazen Williams C=150
- Absolute Roughness = 0.00021 in. (0.00533 mm)

## Nominal Moduli

- Modulus of Elasticity
  Hoop - 3.3 x $10^6$ psi (22,8 GPa)
  Axial - 2.0 x $10^6$ psi (13,8 GPa)
- Poisson’s Ratio (Minor) = 0.39

## Physical Properties

- Density = 124 lbs/cu ft (1988 kgs/cu m)
- Specific Gravity = 1.99

## Thermal Properties

- Coefficient of Thermal Conductivity
  0.2 BTU/(ft•hr•°F) (0.4 W/(m•C°))
- Coefficient of Thermal Expansion
  8.7 x $10^{-6}$ in/in/°F (15,7 x $10^{-6}$ mm/mm/°C)

## Benefits

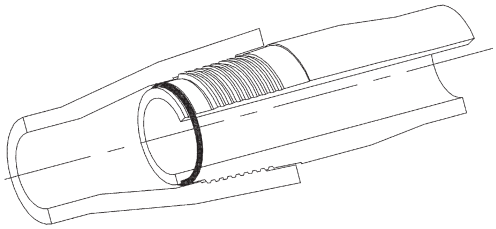
- Corrosion Control
- Reduced Installation Costs
- Improved Flow Efficiency
- Reduced Paraffin & Scale Build-Up
- Reduce Maintenance Cost

## Applications

- Flow Lines or Injection Lines
- TransferLines or Disposal Lines
- Oil, Gas, Saltwater, $CO_2$ and $H_2S$

## Joining System

**Star Super Seal (SSS)**



- Fast, Reliable Installation
- Proprietary Self Restrained Mechanical O-Ring Seal -
  2”-6”, 4 threads per inch
  8”-12”, 2 threads per inch
- All Weather Connection
- Standard O-Rings are Standard Nitrile for applications up to 200° F (93.3° C), PH to 8
- Special O-Rings available for high concentrations of $CO_2$, $H_2S$ and other special applications.

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| SIZE | | PIPE DIMENSIONS (NOMINAL) | | | | | | | | | | Minimum Bending Radius | | Maximum Deflection | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pipe | Product Code | Inside Diameter In | (mm) | Outside Diameter In | (mm) | Wall Thickness In | (mm) | Pipe Weight lbs/ft | (kg/m) | Connection Diameter In | (mm) | Ft | (m) | In/jt | (cm/jt) |
| **Series 450** | | | | | | | | | | | | | | | |
| 2 | F4522 | 2.22 | (56,4) | 2.35 | (59,7) | 0.07 | (1,8) | 0.50 | (,7) | 3.15 | (80,0) | 118 | (36,0) | 44 | (111,8) |
| 3 | F4533 | 3.33 | (84,6) | 3.49 | (88,6) | 0.08 | (2,0) | 0.90 | (1,3) | 4.35 | (110,5) | 175 | (53,3) | 30 | (76,2) |
| 4 | F4543 | 4.32 | (109,7) | 4.49 | (114,0) | 0.08 | (2,0) | 1.20 | (1,8) | 5.45 | (138,4) | 224 | (68,3) | 23 | (58,4) |
| 6 | F4563 | 6.39 | (162,3) | 6.65 | (168,9) | 0.13 | (3,3) | 2.60 | (3,9) | 7.65 | (194,3) | 332 | (101,2) | 16 | (40,6) |
| 8 | I0577 | 7.74 | (196,6) | 8.01 | (203,5) | 0.14 | (3,6) | 3.50 | (5,2) | 9.39 | (238,5) | 401 | (122,2) | 13 | (33,0) |
| 10 | I0598 | 9.84 | (249,9) | 10.20 | (259,1) | 0.18 | (4,6) | 6.70 | (10,0) | 12.10 | (307,3) | 510 | (155,4) | 10 | (25,4) |
| 12 | I05B8 | 11.81 | (300,0) | 12.23 | (310,6) | 0.21 | (5,3) | 8.60 | (12,8) | 14.10 | (358,1) | 611 | (186,2) | 9 | (22,9) |

## Joining System Information (Mechanical O-Ring)

| Pipe Size - Inches<br>Joining System | | 2 | 3 | 4 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|---|---|
| ***STAR*™ Super Seal** | | | | | | | | |
| • Pin Upset O.D. | In | 2.91 | 4.07 | 5.10 | 7.26 | 8.86 | 11.25 | 13.27 |
| | (mm) | (73,9) | (103,4) | (129,5) | (184,4) | (225,0) | (285,8) | (337,1) |
| • Thread Length | In | 3.00 | 3.00 | 3.25 | 3.50 | 5.00 | 6.16 | 6.85 |
| | (mm) | (59,9) | (74,7) | (82,6) | (88,9) | (127,0) | (156,5) | (174,0) |
| • Make Up Length Loss | In | 2.63 | 2.63 | 2.88 | 3.13 | 4.75 | 5.43 | 6.11 |
| | (mm) | (66,8) | (66,8) | (73,2) | (79,5) | (120,7) | (137,9) | (155,2) |
| • O-Ring Dash Number | | 2-228 | 2-237 | 2-245 | 2-260 | 2-369 | 2-449 | 2-453 |

*(Metric Conversions are in Parenthesis)*

| SIZE | STAR™ RATED PRESSURE | | | | Ultimate Collapse ASTM D-2924 | | Ultimate[1] Pressure ASTM D-1599 | | Maximum Support Span | | Short Term Tensile Rating | | Capacity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Static[3] 150° F (65.6° C) | | Cyclic[2] 150° F (65.5° C) | | | | | | | | | | | |
| Pipe | psi | (MPa) | psi | (MPa) | psi | (MPa) | psi | (MPa) | Ft | (m) | Lbs | (kgs) | Bbls/1,000 ft. | ($m^3$/km) |
| **Series 450** | | | | | | | | | | | | | | |
| 2 | 450 | (3,1) | 300 | (2,1) | 210 | (1,4) | 1800 | (12,4) | 9 | (2,8) | 1300 | (590) | 4.80 | (2,5) |
| 3 | 450 | (3,1) | 300 | (2,1) | 120 | (0,8) | 1500 | (10,3) | 11 | (3,4) | 2400 | (1089) | 10.80 | (5,6) |
| 4 | 450 | (3,1) | 300 | (2,1) | 60 | (0,4) | 1200 | (8,3) | 11 | (3,4) | 3200 | (1452) | 18.10 | (9,4) |
| 6 | 450 | (3,1) | 300 | (2,1) | 70 | (0,5) | 1200 | (8,3) | 14 | (4,3) | 7400 | (3357) | 39.70 | (20,7) |
| 8 | 500 | (3,4) | 300 | (2,1) | 50 | (0,3) | 1100 | (7,6) | 15 | (4,6) | 9600 | (4355) | 58.10 | (30,3) |
| 10 | 500 | (3,4) | 300 | (2,1) | 50 | (0,3) | 1100 | (7,6) | 17 | (5,2) | 15900 | (7212) | 94.10 | (49,1) |
| 12 | 500 | (3,4) | 300 | (2,1) | 50 | (0,3) | 1100 | (7,6) | 18 | (5,5) | 22400 | (10161) | 135.50 | (70,7) |

**Corresponding Numbered Notes:**

1. **ULTIMATES PRESSURE** - The typical mode of failure for pressure is weeping.

2. **CYCLIC RATINGS** - The design is based on ASTM D-2992 Procedure A at 150°F (65.6°C). This design provides an 11.4 year life expectancy assuming the product is operated to the full cyclic rating.

3. **STATIC RATED PRESSURE** - For LP/API products the design is based on API 15LR and ASTM D-2992 Procedure B requirements at 150°F (65.6°C). For LP/Standard products the design is based on standard design conditions as outlined on the first page of this design specification.

4. **O-RINGS** - Standard commercial 70 durometer nitrile unless otherwise specified. Refer to Section 2.5 of the NOV Fiber Glass Systems Threaded Line Pipe Installation and Application Practices for additional O-Ring specifications

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