

# STAR™ Anhydride Line Pipe (High Pressure - STANDARD DESIGN - Product Data)

## Product Description

- Pressure - Up to 3000 psi (20,7 MPa)
- Resin System - Anhydride Cured Epoxy
- Reinforcement - Premium Fiberglass
- Joining Systems - API 8rd
- Joint Length - 30 Feet (9,1 mts) Nominal  
Random Lengths of 20 to 32 Feet (6,1 to 9,8 mts)
- Fittings - A variety of filament wound API 5B threaded fittings are available. Purchase all fittings by thread size and design pressure rating only.
- Temperature - Up to 150° F (65.6° C) Maximum
- Sizes - 1½ through 8 inches

## High Pressure Design ≥ 500 psi

- Life Expectancy - 20 years at full rating
- Design Temperature - 150° F (65.6° C)
- Wall Thickness - Nominal
- Hoop Stress - Average Long-Term Hydrostatic Strength (LTHS), ASTM D2992-B
- 100% Factory Hydro Test - All sizes to 1.25 times the Series pressure rating
- Non API Design

## Flow Factors

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

## Nominal Moduli

- Modulus of Elasticity
  - Hoop -  $3.5 \times 10^6$  psi (24,1 GPa)
  - Axial -  $1.5 \times 10^6$  psi (10,3 GPa)
- Poisson's Ratio (Minor) = 0.38

## Physical Properties

- Density = 121 lbs/cu ft (1938 kgs/cu m)
- Specific Gravity = 1.94

## Thermal Properties

- Coefficient of Thermal Conductivity  
0.23 BTU/(ft•hr•°F) (0.4 W/(m•C°))
- Coefficient of Thermal Expansion  
 $13.7 \times 10^{-6}$  in/in/°F ( $24,7 \times 10^{-6}$  mm/mm/°C)

## Benefits

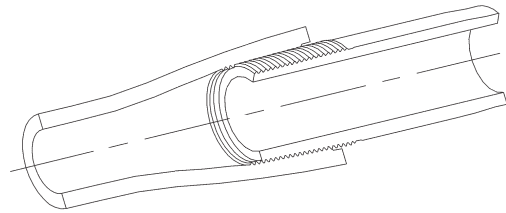
- Corrosion Control
- Reduced Installation Costs
- Improved Flow Efficiency
- Reduced Paraffin & Scale Build-Up
- Reduced Maintenance Cost

## Applications

- Production Lines or Injection Lines
- Transfer Lines or Disposal Lines
- Oil, Gas, Saltwater, CO<sub>2</sub> and H<sub>2</sub>S

## Joining System

**Advanced Composite Thread (ACT) or Precision Ground Thread (PGT)**



- ACT - Molded threads using a graphite, ceramic and epoxy composite for high performance applications.
- PGT - Typical ground threads produced with numerical controlled grinding equipment.
- All 1½" EUE 10rd and 2 ⅜" - 4 ½" EUE 8rd API threads conform to API 5B Table 14, 14 Edition (L4 is minimum) and all 5 ½" - 9 ⅝" OD 8rd casing threads conform to API 5B Table 7, 14 Edition (L4 is minimum).

SIZE		NOMINAL PIPE DIMENSIONS						Minimum Bending Radius		Short-Term Tensile Rating		Mfg. Loc.*
Pipe	Thread	Inside Diameter	Outside Diameter	Wall Thickness	Pipe Weight	Connection Diameter	Ft					
		In (mm)	In (mm)	In (mm)	Lbs/ft (kg/m)	In (mm)						
<b>Series 500 (3,4 MPa)<sup>(1)</sup> - ACT, PGT (All Sizes)</b>												
4	4 1/2	3.75 (95,3)	3.87 (98,3)	0.06 (1,5)	1.26 (1,9)	5.10 (129,5)	196 (59,7)	3000 (1361)	B			
4	4 1/2	3.91 (99,3)	4.04 (102,5)	0.06 (1,6)	1.19 (1,8)	5.09 (129,2)	204 (62,2)	3000 (1361)	W,H			
5	5 1/2	4.74 (120,4)	4.89 (124,3)	0.08 (2,0)	1.52 (2,3)	5.88 (149,4)	245 (74,7)	3600 (1633)	W			
6	6 5/8	5.50 (139,7)	5.68 (144,3)	0.09 (2,3)	1.95 (2,9)	6.97 (177,0)	284 (86,6)	4400 (1996)	B			
6	6 5/8	5.85 (148,6)	6.04 (153,4)	0.09 (2,4)	2.21 (3,3)	7.01 (178,0)	304 (92,7)	6000 (2722)	W,H			
8	8 5/8	7.50 (190,5)	7.74 (196,6)	0.12 (3,1)	3.63 (5,4)	9.06 (230,2)	389 (118,6)	9500 (4309)	W,H,B			
<b>Series 800 (5,5 MPa)<sup>(1)</sup> - ACT, PGT (All Sizes)</b>												
3	3 1/2	3.00 (76,2)	3.16 (80,1)	0.08 (2,0)	0.91 (1,3)	4.09 (104,0)	159 (48,5)	2400 (1089)	W,H,B			
4	4 1/2	3.75 (95,3)	3.94 (100,1)	0.10 (2,5)	1.51 (2,2)	5.16 (131,1)	199 (60,7)	4000 (1814)	B			
4	4 1/2	3.91 (99,3)	4.11 (104,5)	0.10 (2,6)	1.48 (2,2)	5.15 (130,7)	207 (63,1)	4100 (1860)	W,H			
5	5 1/2	4.74 (120,4)	4.99 (126,6)	0.12 (3,1)	2.21 (3,3)	6.00 (152,3)	251 (76,5)	6100 (2767)	W			
6	6 5/8	5.50 (139,7)	5.79 (147,1)	0.14 (3,6)	2.84 (4,2)	7.15 (181,6)	290 (88,4)	7500 (3402)	B			
6	6 5/8	5.85 (148,6)	6.15 (156,3)	0.15 (3,9)	3.08 (4,6)	7.12 (181,0)	309 (94,2)	9100 (4128)	W,H			
8	8 5/8	7.50 (190,5)	7.89 (200,4)	0.19 (4,9)	4.82 (7,2)	9.29 (236,1)	395 (120,4)	13500 (6124)	W,H			
<b>Series 1000 (6,9 MPa)<sup>(1)</sup> - ACT, PGT (All Sizes)</b>												
2 1/2	2 7/8	2.38 (60,5)	2.53 (64,3)	0.08 (2,0)	0.71 (1,1)	3.44 (87,4)	127 (38,7)	1900 (862)	W			
2 1/2	2 7/8	2.43 (61,7)	2.59 (65,7)	0.08 (2,0)	0.71 (1,1)	3.44 (87,3)	130 (39,6)	1900 (862)	H			
3	3 1/2	3.00 (76,2)	3.20 (81,2)	0.10 (2,5)	1.14 (1,7)	4.15 (105,5)	162 (49,4)	3200 (1452)	W,H,B			
4	4 1/2	3.91 (99,3)	4.17 (105,8)	0.13 (3,2)	1.79 (2,7)	5.21 (132,2)	210 (64,0)	5200 (2359)	W,H			
4	4 1/2	3.75 (95,3)	3.99 (101,3)	0.12 (3,0)	1.81 (2,7)	5.22 (132,6)	202 (61,6)	5100 (2313)	B			
5	5 1/2	4.74 (120,4)	5.05 (128,2)	0.15 (3,9)	2.60 (3,9)	6.11 (155,2)	254 (77,4)	7400 (3357)	W			
6	6 5/8	5.50 (139,7)	5.86 (148,8)	0.18 (4,6)	3.71 (5,5)	7.27 (184,7)	296 (90,2)	10600 (4808)	B			
6	6 5/8	5.85 (148,6)	6.23 (158,3)	0.19 (4,8)	3.60 (5,3)	7.30 (185,4)	312 (95,1)	10700 (4854)	W			
8	8 5/8	7.50 (190,5)	7.99 (202,9)	0.24 (6,2)	6.00 (8,9)	9.47 (240,5)	401 (122,2)	17600 (7983)	W,H,B			
<b>Series 1250 (8,6 MPa)<sup>(1)</sup> - ACT, PGT (All Sizes)</b>												
2	2 3/8	2.00 (50,8)	2.16 (55,0)	0.08 (2,1)	0.59 (0,9)	2.94 (74,8)	109 (33,2)	1600 (726)	W,H,B			
2 1/2	2 7/8	2.38 (60,5)	2.57 (65,3)	0.10 (2,5)	0.90 (1,3)	3.50 (88,9)	130 (39,6)	2600 (1179)	W			
2 1/2	2 7/8	2.43 (61,7)	2.63 (66,8)	0.10 (2,5)	0.90 (1,3)	3.50 (88,8)	133 (40,5)	2600 (1179)	H			
3	3 1/2	3.00 (76,2)	3.25 (82,5)	0.12 (3,1)	1.38 (2,1)	4.21 (107,0)	165 (50,3)	4100 (1860)	W,H,B			
4	4 1/2	3.75 (95,3)	4.06 (103,1)	0.15 (3,8)	2.14 (3,2)	5.34 (135,6)	205 (62,5)	6200 (2812)	B			
4	4 1/2	3.91 (99,3)	4.23 (107,5)	0.16 (4,1)	2.12 (3,2)	5.32 (135,2)	213 (64,9)	6300 (2858)	W,H			
5	5 1/2	4.74 (120,4)	5.13 (130,3)	0.19 (5,0)	3.00 (4,5)	6.23 (158,2)	257 (78,3)	8800 (3992)	W			
6	6 5/8	5.50 (139,7)	5.95 (151,1)	0.23 (5,8)	4.24 (6,3)	7.46 (189,5)	299 (91,1)	12300 (5579)	B			
6	6 5/8	5.85 (148,6)	6.33 (160,8)	0.24 (6,1)	4.50 (6,7)	7.42 (188,4)	318 (96,9)	14000 (6350)	W,H			
8	8 5/8	7.50 (190,5)	8.12 (206,2)	0.31 (7,8)	7.25 (10,8)	9.70 (246,4)	406 (123,7)	21800 (9888)	W,H,B			
<b>Series 1500 (10,3 MPa)<sup>(1)</sup> - ACT (All Sizes), PGT (2"-4" Sizes)</b>												
2	2 3/8	2.00 (50,8)	2.20 (55,9)	0.10 (2,5)	0.75 (1,1)	3.00 (76,3)	112 (34,1)	2200 (998)	W,H,B			
2 1/2	2 7/8	2.38 (60,5)	2.61 (66,3)	0.12 (3,0)	0.95 (1,4)	3.58 (90,9)	131 (39,9)	2700 (1225)	W			
2 1/2	2 7/8	2.43 (61,7)	2.67 (67,9)	0.12 (3,1)	1.10 (1,6)	3.56 (90,3)	136 (41,5)	3300 (1497)	H			
3	3 1/2	3.00 (76,2)	3.30 (83,8)	0.15 (3,8)	1.65 (2,5)	4.33 (110,1)	168 (51,2)	5000 (2268)	W,H,B			
4	4 1/2	3.75 (95,3)	4.12 (104,6)	0.19 (4,8)	2.51 (3,7)	5.46 (138,7)	208 (63,4)	7300 (3311)	B			
4	4 1/2	3.91 (99,3)	4.30 (109,2)	0.19 (4,9)	2.48 (3,7)	5.50 (139,7)	216 (65,8)	7400 (3357)	W,H			
5	5 1/2	4.74 (120,4)	5.21 (132,4)	0.24 (6,0)	3.78 (5,6)	6.40 (162,6)	263 (80,2)	11400 (5171)	W			
6	6 5/8	5.50 (139,7)	6.05 (153,7)	0.27 (6,9)	5.19 (7,7)	7.64 (194,1)	305 (93,0)	15600 (7076)	B			
6	6 5/8	5.85 (148,6)	6.43 (163,4)	0.29 (7,4)	5.47 (8,1)	7.59 (192,9)	324 (98,8)	17400 (7893)	W,H			
8	8 5/8	7.50 (190,5)	8.25 (209,5)	0.37 (9,5)	9.08 (13,5)	9.93 (252,3)	415 (126,5)	28200 (12792)	W,H,B			

SIZE		NOMINAL PIPE DIMENSIONS							Minimum Bending Radius		Short-Term Tensile Rating		Mfg. Loc.*
Pipe	Thread	Inside Diameter	Outside Diameter	Wall Thickness	Pipe Weight	Connection Diameter	Ft	(m)					
		In (mm)	In (mm)	In (mm)	Lbs/ft (kg/m)	In (mm)							
<b>Series 1750 (12,1 MPa)<sup>(1)</sup> - ACT (All Sizes), PGT (2"-4" Sizes)</b>													
1 1/2	1.90	1.50 (38,1)	1.68 (42,6)	0.09 (2,2)	0.46 (0,7)	2.51 (63,9)	84 (25,6)	1300 (590)			W,H		
2	2 3/8	2.00 (50,8)	2.23 (56,8)	0.12 (3,0)	0.77 (1,1)	3.07 (77,9)	112 (34,1)	2200 (998)			W,H,B		
2 1/2	2 7/8	2.38 (60,5)	2.65 (67,3)	0.14 (3,6)	1.13 (1,7)	3.68 (93,5)	133 (40,5)	3300 (1497)			W		
2 1/2	2 7/8	2.43 (61,7)	2.71 (69,0)	0.14 (3,6)	1.13 (1,7)	3.68 (93,4)	136 (41,5)	3300 (1497)			H		
3	3 1/2	3.00 (76,2)	3.35 (85,1)	0.18 (4,5)	1.69 (2,5)	4.45 (113,1)	168 (51,2)	5000 (2268)			W,H,B		
4	4 1/2	3.75 (95,3)	4.19 (106,4)	0.22 (5,6)	2.86 (4,3)	5.58 (141,7)	211 (64,3)	8500 (3856)			B		
4	4 1/2	3.91 (99,3)	4.37 (111,0)	0.23 (5,8)	2.83 (4,2)	5.62 (142,8)	219 (66,8)	8600 (3901)			W,H		
5	5 1/2	4.74 (120,4)	5.30 (134,5)	0.28 (7,1)	4.21 (6,3)	6.52 (165,7)	266 (81,1)	12900 (5851)			W		
6	6 5/8	5.50 (139,7)	6.15 (156,1)	0.32 (8,2)	5.95 (8,8)	7.78 (197,5)	310 (94,5)	18100 (8210)			W,H,B		
8	8 5/8	7.50 (190,5)	8.38 (212,8)	0.44 (11,2)	10.41 (15,5)	10.17 (258,4)	421 (128,3)	32700 (14833)			W,B		
<b>Series 2000 (13,8 MPa)<sup>(1)</sup> - ACT (All Sizes), PGT (2"-4" Sizes)</b>													
1 1/2	1.90	1.50 (38,1)	1.70 (43,3)	0.10 (2,6)	0.59 (0,9)	2.58 (65,4)	87 (26,5)	1700 (771)			W,H		
2	2 3/8	2.00 (50,8)	2.27 (57,7)	0.14 (3,4)	0.94 (1,4)	3.13 (79,5)	115 (35,1)	2800 (1270)			W,H,B		
2 1/2	2 7/8	2.38 (60,5)	2.70 (68,6)	0.16 (4,1)	1.34 (2,0)	3.74 (95,0)	136 (41,5)	4000 (1814)			W		
2 1/2	2 7/8	2.43 (61,7)	2.76 (70,1)	0.16 (4,2)	1.34 (2,0)	3.74 (94,9)	139 (42,4)	4100 (1860)			H		
3	3 1/2	3.00 (76,2)	3.41 (86,5)	0.20 (5,2)	1.95 (2,9)	4.52 (114,7)	171 (52,1)	5900 (2676)			W,H,B		
4	4 1/2	3.75 (95,3)	4.26 (108,2)	0.25 (6,4)	3.21 (4,8)	5.71 (145,0)	214 (65,2)	9600 (4355)			B		
4	4 1/2	3.91 (99,3)	4.44 (112,8)	0.26 (6,7)	3.50 (5,2)	5.74 (145,9)	225 (68,6)	10900 (4944)			W,H		
5	5 1/2	4.74 (120,4)	5.38 (136,7)	0.32 (8,1)	5.03 (7,5)	6.70 (170,2)	272 (82,9)	15700 (7122)			W		
6	6 5/8	5.50 (139,7)	6.24 (158,6)	0.37 (9,5)	6.50 (9,7)	7.96 (202,1)	313 (95,4)	19900 (9027)			W,H,B		
<b>Series 2500 (17,2 MPa)<sup>(1)</sup> - ACT (All Sizes), PGT (2"-3" Sizes)</b>													
1 1/2	1.90	1.50 (38,1)	1.76 (44,7)	0.13 (3,3)	0.74 (1,1)	2.70 (68,6)	90 (27,4)	2200 (998)			W,H		
2	2 3/8	2.00 (50,8)	2.34 (59,6)	0.17 (4,4)	1.15 (1,7)	3.32 (84,2)	118 (36,0)	3500 (1588)			W,H,B		
2 1/2	2 7/8	2.38 (60,5)	2.78 (70,6)	0.20 (5,1)	1.59 (2,4)	3.93 (99,8)	140 (42,7)	4800 (2177)			W		
2 1/2	2 7/8	2.43 (61,7)	2.85 (72,4)	0.21 (5,3)	1.80 (2,7)	3.92 (99,7)	145 (44,2)	5600 (2540)			H		
3	3 1/2	3.00 (76,2)	3.52 (89,3)	0.26 (6,6)	2.53 (3,8)	4.77 (121,1)	177 (53,9)	7800 (3538)			W,H,B		
4	4 1/2	3.75 (95,3)	4.40 (111,8)	0.32 (8,1)	3.99 (5,9)	6.02 (152,9)	221 (67,4)	12100 (5489)			B		
4	4 1/2	3.91 (99,3)	4.58 (116,4)	0.34 (8,6)	4.26 (6,3)	5.99 (152,2)	231 (70,4)	13500 (6124)			W,H		
<b>Series 3000 (20,7 MPa)<sup>(1)</sup> - ACT (All Sizes) or PGT (2" &amp; 2 1/2" Sizes)</b>													
1 1/2	1.90	1.50 (38,1)	1.82 (46,1)	0.16 (4,0)	0.90 (1,3)	2.83 (71,9)	93 (28,3)	2700 (1225)			W,H		
2	2 3/8	2.00 (50,8)	2.42 (61,5)	0.21 (5,4)	1.36 (2,0)	3.45 (87,5)	121 (36,9)	4200 (1905)			W,H,B		
2 1/2	2 7/8	2.38 (60,5)	2.88 (73,2)	0.25 (6,4)	2.09 (3,1)	4.58 (116,3)	145 (44,2)	6000 (2722)			W		
2 1/2	2 7/8	2.43 (61,7)	2.94 (74,8)	0.26 (6,5)	2.07 (3,1)	4.11 (104,5)	149 (45,4)	6500 (2948)			H		
3**	3 1/2	3.00 (76,2)	3.61 (91,7)	0.31 (7,7)	3.13 (4,7)	4.96 (125,9)	183 (55,8)	9900 (4491)			W,H		
4	4 1/2	3.75 (95,3)	4.54 (115,4)	0.40 (10,1)	5.08 (7,6)	6.33 (160,7)	230 (70,1)	15800 (7167)			W,H,B		

\*\*3" rated to 2900 psi.

**NOTE:** Additional pressure classes are available on request.

<sup>(1)</sup> **Series Rating** - All ratings are maximum operating limits. Exceeding these limits will void the warranty on all NOV Fiber Glass Systems pipe.

**\*Manufacturing Location**

W = Wichita      H = Harbin      B = Brazil

## Joining System Information (API 8rd Thread)

Joining System Pipe Size - Inches	1 1/2	2	2 1/2	3	4	5	6	8	8	
Thread Size	1.90" EUE 10rd	2 3/8" EUE 8rd	2 7/8" EUE 8rd	3 1/2" EUE 8rd	4 1/2" EUE 8rd	5 1/2" OD 8rd	6 5/8" OD 8rd	8 5/8" OD 8rd	9 5/8" OD 8rd	
• Pin Upset O.D.	In (mm)	2.15 (54,6)	2.60 (66,0)	3.10 (78,7)	3.75 (95,3)	4.75 (120,7)	5.55 (141,0)	6.65 (168,9)	8.65 (219,7)	9.65 (245,1)
• Thread Length	In (mm)	2.36 (59,9)	2.94 (74,7)	3.25 (82,6)	3.50 (88,9)	3.88 (98,6)	4.75 (120,7)	4.25 (108,0)	4.85 (123,2)	5.13 (130,3)
• Make Up Length Loss	In (mm)	2.06 (52,4)	2.56 (65,1)	2.86 (73,0)	3.13 (79,4)	3.50 (88,9)	4.38 (111,1)	3.88 (98,4)	4.50 (114,3)	4.75 (120,7)

**API CONNECTIONS** - All products are produced integral joint unless indicated (TC) Threaded and Coupled. Any order may include up to 15% threaded and coupled pipe. All 1 1/2" EUE 10rd and 2 3/8" - 4 1/2" EUE 8rd API threads conform to API 5B Table 14, 14 Edition (L4 is minimum) and all 5 1/2" - 9 5/8" OD 8rd casing threads conform to API 5B Table 7, 14 Edition (L4 is minimum).

### Performance Ratings vs. Temperature

ASTM D 2992-B	150° F	(65.6°) C
11.4 Year Life, LTHS	24,503 psi	(169,0) MPa
20 Year Life, LTHS (long term hydrostatic stress)	23,768 psi	(163,9) MPa
20 Year Life, LCL (Lower Confidence Limit)	22,297 psi	(153,7) MPa

### Pipe Capacity

Size Pipe	Inside Diameter		Capacity	
	in	(mm)	Bbls/1,000 ft.	(m <sup>3</sup> /km)
1 1/2	1.50	(38,1)	2.20	(1,1)
2	2.00	(50,8)	3.90	(2,0)
2 1/2	2.38	(60,5)	5.50	(2,9)
2 1/2	2.43	(61,7)	5.70	(3,0)
3	3.00	(76,2)	8.70	(4,5)
4	3.75	(95,3)	13.70	(7,1)
4	3.91	(99,3)	14.80	(7,7)
5	4.74	(120,4)	21.80	(11,4)
6	5.50	(139,7)	29.40	(15,3)
6	5.85	(148,6)	33.20	(17,3)
8	7.50	(190,5)	54.60	(28,5)

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15HR-0004 / 15LR-0004.1  
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