

# STAR™ Anhydride Line Pipe (High Pressure - API 15HR DESIGN - Product Data)

## Product Description

- Pressure - Up to 2750 psi (19,0 MPa)
- Resin System - Anhydride Cured Epoxy
- Reinforcement - Premium Fiberglass
- Joining Systems - API 8rd Threaded
- Joint Length - 30 Feet (9,1 mts) Nominal  
Random Lengths of 20 to 32 Feet (6,1 to 9,8 mts)
- Temperature - Up to 150°F (65.6° C) Maximum
- Sizes - 1½ through 8 inches
- Fittings - A variety of filament wound API 5B threaded fittings are available. API 15HR design systems require higher rated fittings, refer to the STAR High Pressure Threaded Fittings Product Data sheet. Temperature interpolation is not recommended for fittings.

## High Pressure Design $\geq$ 500 psi

- Design Life - 20 years at full rating
- Design Temperature - 150°F (65.6° C)
- Wall Thickness - Minimum
- Hoop Stress - Lower Confidence Limit (LCL) of Long Term Hydrostatic Strength according to ASTM D2992-B
- 100% Factory Hydro Test - All sizes to 1.5 times the Series pressure rating

## 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

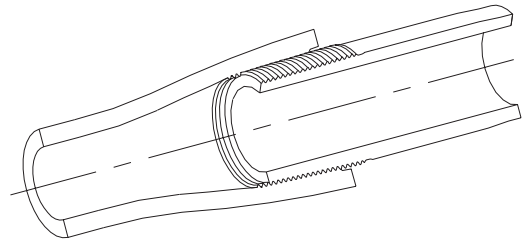
- Corrosion Control
- Reduced Installation Costs
- Improved Flow Efficiency
- Reduced Paraffin & Scale Build-Up
- Reduced Maintenance Cost

## 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)



### API Threads

- ACT - Molded threads using a graphite, ceramic and epoxy composite for high performance applications.
- Precision Ground Thread (PGT) - Typical ground threads produced with numerical controlled grinding equipment.
- All 1½" EUE 10rd and 2 ¾" - 4 ½" EUE 8rd API threads conform to API 5B Table 14, 14th Edition (L4 is minimum) and all 5½" - 9 ⅝" OD 8rd casing threads conform to API 5B Table 7, 14th Edition (L4 is minimum).

SIZE		NOMINAL PIPE DIMENSIONS						Minimum Bending Radius		Short Term Tensile Rating		Mfg Loc*
Pipe	Thread	Inside Diameter In (mm)	Outside Diameter In (mm)	Wall Thickness In (mm)	Pipe Weight Lbs/ft (kg/m)	API Thread Conn. Dia In (mm)	Ft	(m)	Lbs	(kgs)		

<b>Series 500 (3,4 MPa)<sup>(1)</sup> - ACT (All Sizes), PGT (All Sizes except 5")</b>											
3	3 1/2	3.00 (76,2)	3.12 (79,3)	0.06 (1,6)	0.92 (1,4)	4.15 (105,4)	159 (48,5)	2400 (1089)	W,H,B		
4	4 1/2	3.75 (95,3)	3.90 (99,1)	0.08 (1,9)	1.32 (2,0)	5.16 (131,1)	196 (59,7)	3000 (1361)	B		
4	4 1/2	3.91 (99,3)	4.07 (103,4)	0.08 (2,0)	1.21 (1,8)	5.15 (130,8)	204 (62,2)	3000 (1361)	W,H		
5	5 1/2	4.74 (120,4)	4.93 (125,3)	0.10 (2,5)	1.89 (2,8)	5.99 (152,2)	248 (75,6)	4800 (2177)	W		
6	6 5/8	5.50 (139,7)	5.72 (145,3)	0.11 (2,8)	2.47 (3,7)	7.09 (180,1)	287 (87,5)	5900 (2676)	B		
6	6 5/8	5.85 (148,6)	6.08 (154,6)	0.12 (3,0)	2.38 (3,5)	7.10 (180,3)	305 (93,0)	6400 (2903)	W,H		
8	8 5/8	7.50 (190,5)	7.81 (198,3)	0.15 (3,9)	4.22 (6,3)	9.18 (233,1)	392 (119,5)	11500 (5216)	W,H,B		

<b>Series 750 (5,2 MPa)<sup>(1)</sup> - ACT (All Sizes), PGT (All Sizes except 5")</b>											
2 1/2	2 7/8	2.38 (60,5)	2.52 (64,0)	0.07 (1,8)	0.72 (1,1)	3.50 (88,9)	127 (38,7)	1900 (862)	W		
2 1/2	2 7/8	2.43 (61,7)	2.58 (65,5)	0.08 (1,9)	0.72 (1,1)	3.49 (88,7)	130 (39,6)	1900 (862)	H		
3	3 1/2	3.00 (76,2)	3.19 (80,9)	0.09 (2,4)	1.16 (1,7)	4.21 (106,9)	162 (49,4)	3200 (1452)	W,H,B		
4	4 1/2	3.75 (95,3)	3.98 (101,1)	0.12 (2,9)	1.57 (2,3)	5.22 (132,6)	199 (60,7)	4000 (1814)	B		
4	4 1/2	3.91 (99,3)	4.15 (105,4)	0.12 (3,0)	1.80 (2,7)	5.26 (133,6)	210 (64,0)	5200 (2359)	W,H		
5	5 1/2	4.74 (120,4)	5.03 (127,8)	0.15 (3,7)	2.60 (3,9)	6.11 (155,2)	254 (77,4)	7400 (3357)	W		
6	6 5/8	5.50 (139,7)	5.84 (148,3)	0.17 (4,3)	3.33 (5,0)	7.21 (183,1)	293 (89,3)	9000 (4082)	B		
6	6 5/8	5.85 (148,6)	6.21 (157,8)	0.18 (4,5)	3.32 (4,9)	7.22 (183,4)	311 (94,8)	9800 (4445)	W,H		
8	8 5/8	7.50 (190,5)	7.96 (202,3)	0.23 (5,9)	5.49 (8,2)	9.37 (238,0)	398 (121,3)	15900 (7212)	W,H,B		

<b>Series 1000 (6,9 MPa)<sup>(1)</sup> - ACT (All Sizes), PGT (All Sizes except 5")</b>											
2	2 3/8	2.00 (50,8)	2.17 (55,0)	0.08 (2,1)	0.60 (0,9)	3.00 (76,3)	109 (33,2)	1600 (726)	W,H,B		
2 1/2	2 7/8	2.38 (60,5)	2.57 (65,3)	0.10 (2,4)	0.91 (1,4)	3.56 (90,4)	130 (39,6)	2600 (1179)	W		
2 1/2	2 7/8	2.43 (61,7)	2.63 (66,9)	0.10 (2,6)	0.91 (1,4)	3.55 (90,3)	133 (40,5)	2600 (1179)	H		
3	3 1/2	3.00 (76,2)	3.25 (82,5)	0.12 (3,2)	1.40 (2,1)	4.27 (108,5)	165 (50,3)	4100 (1860)	W,H,B		
4	4 1/2	3.75 (95,3)	4.06 (103,1)	0.16 (3,9)	2.17 (3,2)	5.34 (135,6)	205 (62,5)	6200 (2812)	B		
4	4 1/2	3.91 (99,3)	4.24 (107,6)	0.16 (4,0)	2.12 (3,2)	5.32 (135,1)	213 (64,9)	6300 (2858)	W,H		
5	5 1/2	4.74 (120,4)	5.13 (130,4)	0.20 (5,0)	3.00 (4,5)	6.23 (158,2)	257 (78,3)	8800 (3992)	W		
6	6 5/8	5.50 (139,7)	5.96 (151,4)	0.23 (5,8)	4.20 (6,3)	7.40 (188,0)	299 (91,1)	12300 (5579)	B		
6	6 5/8	5.85 (148,6)	6.34 (160,9)	0.24 (6,0)	4.33 (6,4)	7.42 (188,5)	317 (96,6)	13300 (6033)	W,H		
8	8 5/8	7.50 (190,5)	8.12 (206,3)	0.31 (7,9)	7.21 (10,7)	9.64 (244,9)	406 (123,7)	21800 (9888)	W,H,B		

<b>Series 1250 (8,6 MPa)<sup>(1)</sup> - ACT (All Sizes), PGT (2"-4" &amp; 6" Sizes)</b>											
1 1/2	1.90	1.50 (38,1)	1.66 (42,1)	0.08 (2,0)	0.46 (0,7)	2.51 (63,8)	84 (25,6)	1200 (544)	W,H		
2	2 3/8	2.00 (50,8)	2.21 (56,1)	0.10 (2,7)	0.76 (1,1)	3.06 (77,8)	112 (34,1)	2200 (998)	W,H,B		
2 1/2	2 7/8	2.38 (60,5)	2.62 (66,5)	0.12 (3,1)	0.97 (1,4)	3.59 (91,2)	131 (39,9)	2800 (1270)	W		
2 1/2	2 7/8	2.43 (61,7)	2.68 (68,2)	0.13 (3,2)	1.12 (1,7)	3.62 (91,8)	136 (41,5)	3300 (1497)	H		
3	3 1/2	3.00 (76,2)	3.31 (84,2)	0.16 (4,0)	1.65 (2,5)	4.33 (110,1)	168 (51,2)	5000 (2268)	W,H,B		
4	4 1/2	3.75 (95,3)	4.14 (105,2)	0.20 (5,0)	2.48 (3,7)	5.46 (138,7)	208 (63,4)	7300 (3311)	B		
4	4 1/2	3.91 (99,3)	4.32 (109,7)	0.20 (5,1)	2.51 (3,7)	5.46 (138,7)	216 (65,8)	7600 (3447)	W,H		
5	5 1/2	4.74 (120,4)	5.24 (133,0)	0.25 (6,3)	3.79 (5,6)	6.40 (162,7)	263 (80,2)	11500 (5216)	W		
6	6 5/8	5.50 (139,7)	6.08 (154,4)	0.29 (7,4)	5.26 (7,8)	7.64 (194,1)	305 (93,0)	15600 (7076)	B		
6	6 5/8	5.85 (148,6)	6.46 (164,2)	0.30 (7,6)	5.45 (8,1)	7.73 (196,3)	323 (98,5)	16900 (7666)	W,H		
8	8 5/8	7.50 (190,5)	8.29 (210,5)	0.39 (10,0)	9.04 (13,5)	9.88 (250,9)	415 (126,5)	28300 (12837)	W,H,B		

SIZE		NOMINAL PIPE DIMENSIONS						Minimum Bending Radius Ft (m)	Short Term Tensile Rating Lbs (kgs)	Mfg Loc*
Pipe	Thread	Inside Diameter In (mm)	Outside Diameter In (mm)	Wall Thickness In (mm)	Pipe Weight Lbs/ft (kg/m)	Connection Diameter In (mm)				

Series 1500 (10,3 MPa) <sup>(1)</sup> - ACT (All Sizes), PGT (2"-4" Sizes)												
1 1/2	1.90	1.50 (38,1)	1.69 (42,9)	0.10 (2,4)	0.59 (0,9)	2.57 (65,4)	87 (26,5)	1700 (771)	W,H			
2	2 3/8	2.00 (50,8)	2.25 (57,3)	0.13 (3,2)	0.83 (1,2)	3.11 (78,9)	113 (34,4)	2400 (1089)	W,H,B			
2 1/2	2 7/8	2.38 (60,5)	2.67 (67,8)	0.15 (3,7)	1.13 (1,7)	3.68 (93,5)	133 (40,5)	3300 (1497)	W			
2 1/2	2 7/8	2.43 (61,7)	2.74 (69,6)	0.15 (3,9)	1.19 (1,8)	3.65 (92,8)	137 (41,8)	3600 (1633)	H			
3	3 1/2	3.00 (76,2)	3.38 (85,9)	0.19 (4,8)	1.93 (2,9)	4.46 (113,2)	171 (52,1)	5900 (2676)	W,H,B			
4	4 1/2	3.75 (95,3)	4.23 (107,4)	0.24 (6,1)	2.89 (4,3)	5.64 (143,3)	211 (64,3)	8500 (3856)	B			
4	4 1/2	3.91 (99,3)	4.41 (111,9)	0.24 (6,2)	3.14 (4,7)	5.62 (142,8)	222 (67,7)	9700 (4400)	W,H			
5	5 1/2	4.74 (120,4)	5.34 (135,7)	0.30 (7,7)	4.60 (6,8)	6.58 (167,2)	269 (82,0)	14300 (6486)	W			
6	6 5/8	5.50 (139,7)	6.20 (157,5)	0.35 (8,9)	6.41 (9,5)	7.84 (199,1)	313 (95,4)	19800 (8981)	W,H,B			
8	8 5/8	7.50 (190,5)	8.45 (214,7)	0.48 (12,1)	11.00 (16,4)	10.18 (258,5)	424 (129,2)	35000 (15876)	W,H,B			

Series 1750 (12,1 MPa) <sup>(1)</sup> - ACT (All Sizes), PGT (2"-4" Sizes)												
2	2 3/8	2.00 (50,8)	2.30 (58,4)	0.15 (3,8)	0.98 (1,5)	3.15 (80,1)	116 (35,4)	3000 (1361)	W,HB			
2 1/2	2 7/8	2.38 (60,5)	2.72 (69,1)	0.17 (4,4)	1.36 (2,0)	3.8 (96,5)	137 (41,8)	4000 (1814)	W			
2 1/2	2 7/8	2.43 (61,7)	2.79 (71,0)	0.18 (4,6)	1.39 (2,1)	3.76 (95,6)	140 (42,7)	4200 (1905)	H			
3	3 1/2	3.00 (76,2)	3.45 (87,6)	0.22 (5,7)	2.22 (3,3)	4.58 (116,3)	174 (53,0)	6900 (3130)	W,H,B			
4	4 1/2	3.75 (95,3)	4.31 (109,5)	0.28 (7,1)	3.55 (5,3)	5.77 (146,6)	218 (66,4)	10800 (4899)	B			
4	4 1/2	3.91 (99,3)	4.50 (114,2)	0.29 (7,2)	3.53 (5,3)	5.8 (147,3)	225 (68,6)	11000 (4990)	W,H			
5	5 1/2	4.74 (120,4)	5.45 (138,4)	0.36 (9,0)	5.23 (7,8)	6.75 (171,4)	273 (83,2)	16400 (7439)	W			
6	6 5/8	5.50 (139,7)	6.32 (160,6)	0.41 (10,5)	7.09 (10,6)	8.04 (204,3)	317 (96,6)	21900 (9934)	W,H,B			

Series 2000 (13,8 MPa) <sup>(1)</sup> - ACT (All Sizes), PGT (2"-3" & 4" Sizes)												
1 1/2	1.90	1.50 (38,1)	1.76 (44,7)	0.13 (3,3)	0.73 (1,1)	2.64 (67,1)	90 (27,4)	2200 (998)	W,H			
2	2 3/8	2.00 (50,8)	2.35 (59,6)	0.17 (4,4)	1.14 (1,7)	3.26 (82,7)	118 (36,0)	3500 (1588)	W,H,B			
2 1/2	2 7/8	2.38 (60,5)	2.77 (70,4)	0.20 (5,1)	1.57 (2,3)	3.87 (98,3)	140 (42,7)	4800 (2177)	W			
2 1/2	2 7/8	2.43 (61,7)	2.85 (72,4)	0.21 (5,3)	1.64 (2,4)	3.89 (98,8)	143 (43,6)	5100 (2313)	H			
3	3 1/2	3.00 (76,2)	3.52 (89,4)	0.26 (6,6)	2.52 (3,7)	4.71 (119,5)	177 (53,9)	7800 (3538)	W,H,B			
4	4 1/2	3.75 (95,3)	4.40 (111,8)	0.33 (8,3)	3.92 (5,8)	5.96 (151,4)	221 (67,4)	12100 (5489)	B			
4	4 1/2	3.91 (99,3)	4.59 (116,5)	0.33 (8,4)	4.23 (6,3)	5.93 (150,6)	231 (70,4)	13500 (6124)	W,H			
6	6 5/8	5.50 (139,7)	6.45 (163,9)	0.48 (12,1)	8.18 (12,2)	8.29 (210,7)	323 (98,5)	25500 (11567)	W,H,B			

Series 2500 (17,2 MPa) <sup>(1)</sup> - ACT (All Sizes), PGT (2", 2 1/2" & 3" Sizes)												
1 1/2	1.90	1.50 (38,1)	1.83 (46,5)	0.17 (4,2)	0.90 (1,3)	2.83 (71,9)	93 (28,3)	2700 (1225)	W,H			
2	2 3/8	2.00 (50,8)	2.44 (62,0)	0.22 (5,6)	1.42 (2,1)	3.48 (88,5)	122 (37,2)	4400 (1996)	W,H,B			
2 1/2	2 7/8	2.38 (60,5)	2.89 (73,4)	0.26 (6,5)	2.00 (3,0)	4.26 (108,2)	145 (44,2)	6100 (2767)	W			
2 1/2	2 7/8	2.43 (61,7)	2.97 (75,4)	0.27 (6,8)	2.08 (3,1)	4.12 (104,6)	149 (45,4)	6500 (2948)	H			
3	3 1/2	3.00 (76,2)	3.66 (93,1)	0.33 (8,4)	3.13 (4,7)	4.96 (126,1)	183 (55,8)	9900 (4491)	W,H,B			
4	4 1/2	3.75 (95,3)	4.58 (116,3)	0.42 (10,5)	5.09 (7,6)	6.33 (160,8)	230 (70,1)	15800 (7167)	W,H,B			

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

<sup>(1)</sup> **SERIES PRESSURE (API 15HR)** - Based on minimum wall thickness dimensions and API 15HR Edition 3, for a 20 year life expectancy. API Monogrammed pipe available on request.

**\*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 2.15 (mm) (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 2.36 (mm) (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 2.06 (mm) (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. All 1 1/2" EUE 10rd and 2 3/8" - 4 1/2" EUE 8rd API threads conform to API 5B Table 14, 14th Edition (L4 is minimum) and all 5 1/2" - 9 5/8" OD 8rd casing threads conform to API 5B Table 7, 14th Edition (L4 is minimum).

Performance Ratings		
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)	21,400 psi	(147,6) 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  
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