

A large green fiberglass pipe is being installed in a trench. The pipe is supported by an orange cone in the foreground. In the background, a worker is visible in the trench. The pipe has a black end cap.

High Pressure Fiberglass Line Pipe Product Guide

For Oil & Gas Applications

High Pressure Line Pipe Product Summary Table

Brand Name	Epoxy Curing Agent	Design Basis	S. T. A. M. P.					Pressure Range By Diameter (Min./Max.)											Joint Types Available		
			Size Range (in)	Max. Operating Temperature (°F)	Applications	Media*	Pressure Range (psi)	1½	2	2½	3	4	5	6	8	10	12				
Star	Anhydride	Standard	1½ - 8	150	P, I, T, D	O, W, G, C, H	500 - 3,000	1,750 3,000	1,250 3,000	1,000 3,000	800 2,900	500 3,000	500 2,000	500 2,000	500 1,750			ACT	PGT	Flange	
Star	Anhydride	API 15HR	1½ - 8	150	P, I, T, D	O, W, G, C, H	500 - 2,500	1,250 2,500	1,000 2,500	750 2,500	500 2,500	500 2,500	500 1,750	500 2,000	500 1,500			ACT	PGT	Flange	
Star	Anhydride	API 15HR	2 - 3	150	P, I, T, D	O, W, G, C, H	500		500		500							CEN		Flange	
Star	Anhydride	API 15HR	2 - 4	150	P, I, T, D	O, W, G, C, H	750 - 2,500		1,000 2,500		750 2,500	750 1,500						SP		Flange	
Star	Anhydride	API 15HR	4 - 6	150	P, I, T, D	O, W, G, C, H	500 - 2,250					1,750 2,250		500 2,000				SPH		Flange	
Star	Anhydride	API 15HR	6 - 12	150	P, I, T, D	O, W, G, C, H	1000 - 3,000							2,250 3,000	1,000 2,750 [†]	1,000 2,250	1,000 2,000	SS HP		Flange	
Star	Aliphatic Amine	Standard	1½ - 8	200	P, I, T, D	O, W, G, C, H	500 - 3,500	1,500 3,500	800 3,500	800 3,500	500 3,500	500 3,500	500 2,000	500 2,500	500 2,000			ACT		Flange	
Star	Aliphatic Amine	API 15HR	1½ - 8	200	P, I, T, D	O, W, G, C, H	500 - 3,000	1,500 3,000	750 3,000	750 3,000	500 3,000	500 3,000	750 1,000	500 2,000	500 1,750			ACT		Flange	
Star	Aliphatic Amine	Standard	8 - 12	200	P, I, T, D	O, W, G, C, H	500 - 1,250								500 1,250	500 1,250	500 1,250	SS		Flange	
Star	Aliphatic Amine	API 15HR	8 - 12	200	P, I, T, D	O, W, G, C, H	500 - 1,000								500 1,000	500 1,000	500 1,000	SS		Flange	
Star	Aromatic Amine	API 15HR	1½ - 8	212	P, I, T, D	O, W, G, C, H	500 - 2,500	1,750 2,500	1,000 2,500	750 2,500	750 2,500	750 2,000	750 1,500	500 1,750	500 1,250			ACT	PGT	Flange	
Star	Aromatic Amine	API 15HR	2 - 3	212	P, I, T, D	O, W, G, C, H	500		500		500							CEN		Flange	
Star	Aromatic Amine	API 15HR	2 - 4	212	P, I, T, D	O, W, G, C, H	500 - 2,000		1,000 2,000		750 2,000	750 1,250						SP		Flange	
Star	Aromatic Amine	API 15HR	2 - 6	212	P, I, T, D	O, W, G, C, H	500 - 1,750					1,500 1,750		500 1,750				SPH		Flange	
Star	Aromatic Amine	API 15HR	8 - 12	212	P, I, T, D	O, W, G, C, H	1000 - 2,500								1,000 2,250 [†]	1,000 2,000 [†]	1,000 1,750 [†]	SS HP		Flange	
Fiberspar (E)	Anhydride	API 15HR, 15S (RP)	2 - 6	140	P, I, T, D, R	O, W, G, C, H	750 - 3,500		750 3,500	750 3,500	750 3,500	750 ³ 1,500	750 ⁴ 1,500	750 ⁵ 1,500	750 ⁶ 1,500	750 ⁷ 1,500		8rd, NPT	Weld, Other	Flange	
Fiberspar (X)	Anhydride	API 15HR, 15S (RP)	2 - 6	180	P, I, T, D, R	O, W, G, C, H	750 - 3,500		750 3,500	750 3,500	750 3,500	750 ³ 1,500	750 ⁴ 1,500	750 ⁵ 1,500	750 ⁶ 1,500	750 ⁷ 1,500		8rd, NPT	Weld, Other	Flange	
Fiberspar (XT)	Anhydride	API 15HR, 15S (RP)	2 - 6	203	P, I, T, D, R	W	750 - 3,500		750 3,500	750 3,500	750 3,500	750 ³ 1,500	750 ⁴ 1,500	750 ⁵ 1,500	750 ⁶ 1,500	750 ⁷ 1,500		8rd, NPT	Weld, Other	Flange	

Applications: P - Production Flow Lines; I - Injection Lines; T - Transfer Lines; D - Disposal Lines; R - Rehabilitation of Corroded Lines

Media: O - Oil; W - Water (Produced, Salt, Fresh); G - Natural Gas; C - CO₂ or Fluids Containing CO₂; H - Sour Services (Fluids Containing H₂S);

* In all cases, chemical compatibility along with other know operating conditions must be considered when selecting the proper piping system.

Notes:

[†] Additional pressure ratings may be available. Consult NOV Fiber Glass Systems Engineering for details.

Notes on Diameters: ³ Dia. = 3 ½; ⁴ Dia. = 4; ⁵ Dia. = 5; ⁶ Dia. = 6; ⁷ Dia. = 6 ½

(RP) indicates Recommended Practice

Product Series

Star Anhydride - ACT or PGT

- Thread design per API Specification 5B
- Full line of filament wound fittings
- Standard or API design

Applications: Suitable for all, sweet or mildly sour, oil field services with limited CO₂ content

Features: Minimum 20 year service life at full rating based on 150°F design temperature and nominal (standard) or minimum (API) wall thickness

Star Anhydride - SS HP

- 2 thread-per-inch mechanical joint with O-ring seal
- Filament wound elbows, couplings, and flanges available
- Standard or API design

Applications: Designed for transfer of high volumes of fluid at high pressure. Fast assembly joint.

Features: Full pressure rating up to 150°F

Star Anhydride - CEN

- 4 thread-per-inch modified ACME thread with O-ring seal
- Full line of filament wound fittings
- API design

Applications: Low pressure, fast-assembly, flowline product for general service piping needs; larger than normal ID

Features: Not intended for gas service. Sulfur-cured O-ring not recommended for sour service

Star Anhydride - SP, SPH

- 4 thread-per-inch round form (SP) or buttress (SPH) sealing thread secondary O-ring seal
- Full line of filament wound fittings
- API Design

Applications: Proprietary joint designs for fast, reliable assembly

Features: Position-based thread assembly. Suitable for gas service

Star Aliphatic Amine - ACT

- Similar to Anhydride cured offering, with higher performance characteristics with regards to temperature and resistance to CO₂ and H₂S exposures
- Standard or API design

Applications: Designed for fast, reliable assembly

Features: Position-based thread assembly. Suitable for gas service

Star Aliphatic Amine - SS

- 2 thread-per-inch mechanical joint with O-ring seal
- Full line of filament wound fittings
- Standard or API design

Applications: Designed for high volume lines at high temperatures; fast assembly joint well suited for long lines

Features: Standard size O-ring used. A variety of elastomer materials are available

Star Aromatic Amine - CEN

- 4 thread-per-inch modified ACME thread with O-ring seal
- Higher temperature rated version of Anhydride cured product with higher performance in CO₂ and H₂S environments

Applications: Provided for transfer of high temperature, more corrosive fluid handling lines

Features: Temperature performance of O-ring material should be considered during selection

Star Aromatic Amine - SP, SPH

- 4 thread-per-inch round form (SP) or buttress (SPH) sealing thread with secondary O-ring seal
- API design

Applications: Combines characteristics of double-seal joint, high pressure and high temperature designs

Features: Highly regarded product for wide variety of upper-end services up to 212°F

Star Aromatic Amine - ACT, PGT

- Premium product available with ACT and PGT joint
- Full line of filament wound fittings
- API design only

Applications: Product of choice for severe service, regulated systems

Features: Premium product line providing highest allowable operating temperature

Star Aromatic Amine - SS HP

- 2 thread-per-inch mechanical joint with O-ring seal
- Extended range product at upper end of available design and performance
- API design only

Applications: Provide high flow capacity for hot, corrosive fluids in characteristically large systems

Features: Product line expands the range of services covered by fiberglass pipe

Fiberspar (E), (X) and (XT)

- High performance, only true Glass Reinforced Epoxy (GRE) spoolable line pipe product
- Designed with various grades of thermoplastics in bonded liner and formed jacket layers, enveloping the GRE structural wall
- Connectors employ positive grip on GRE layer and are designed to be reusable and are immune to viscoelastic creep which plagues other designs

Applications: Product is rapidly deployed and is installed by Certified Installers thoroughly trained and tested by Fiber Glass Systems personnel

Features: This is not thermoplastic pipe made stronger, it is GRE pipe made spoolable

Standard Design and API Design

Long-term regression testing is done on a set of identical samples with pressure held steady at predetermined stress levels to cause short-term, medium-term and long-term failures, according to ASTM D2992 - Procedure B. Statistical analysis of the time vs. stress data points is performed and plotted on log/log scales, including least-squares fit of the regression line, extrapolation to the design life, calculation of variance to qualify the consistency of the data and upper and lower confidence limits. Standard design utilizes a Long Term Hydrostatic Strength (LTHS) at 100,000 hours (11.4 years) or 175,200 hours (20 years) and applies a 0.5 or 0.67 Service Factor to determine the Hydrostatic Design Stress (HDS), which is then applied to the nominal wall thickness of the pipe to determine its pressure rating. API design uses a 0.67 Service Factor at a 20-year design life, utilizing the 95% Lower Confidence Limit (LCL), and applies it to the minimum wall thickness. For a detailed explanation, please contact Fiber Glass Systems Application Engineering. Standard design product is 100% factory hydro tested at 1.25 times its rated pressure. API design product is 100% factory hydro tested at 1.50 times its rated pressure.

Connections

ACT

Molded, 8 threads per inch using a graphite, ceramic and epoxy composite for high performance applications. Threads conform to API Standard 5B (14th Edition).



SS, SS HP

“STAR Super Seal” heavy-duty, modified ACME (non-sealing), 2 thread per inch threads with an o-ring seal.



PGT

Ground threads produced with diamond-coated, profiled grinding wheels and numerical controlled grinding equipment. API conformance as described for ACT.



CEN

CEN is similar to the SS with 4 threads per inch.

Flange

ANSI 16.5 compliant flange connection for full range of pressure ratings. Flanges for STAR products have internal female threads and assemble on to male threaded pipe ends or threaded pipe nipples. Fiberspar flanged Service End Connectors are metallic and are welded to body of the connectors.

SP

Ground, round-form, 4 threads per inch threads providing a position-based seal, complemented with an o-ring seal.



SPH

Ground, trapezoidal-form (buttress), 4 threads per inch threads providing a high strength, position-based seal, complemented with an o-ring seal.

NPT Threads or Weld-Ends

Unique to Fiberspar within Fiber Glass Systems, pipe to pipe connectors are used when connecting pieces of spoolable pipe together, whether for extending the length of the line or for repairing a damaged section.



Note: All female fiberglass threads are made on profile tooling to form mating threads to the male threads as described above.



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