



What are the primary applications of LinePipe?

LinePipe is ideal for new flowline installations, especially in corrosive environments onshore. LinePipe is also the most cost-effective way to permanently remediate existing flowlines and restore them to full strength and full flow.

Is LinePipe compatible with oilfield fluids?

Fiberspar LinePipe is compatible with virtually all common upstream oilfield fluids. A table of recommended usage for Fiberspar LinePipe is provided in the document Fiberspar LinePipe Engineering Guide, which is available on request or online at www.fiberspar.com.

How are end terminations made, or lengths of LinePipe joined?

Fiberspar patented connectors use mechanical compression and O-ring seals, and do not rely on glue, epoxies or threads cut in the laminate. Connectors can be supplied with a flange, weld neck, NPT, other standard end configuration, and in a pipe-to-pipe joining configuration. Fiberspar connectors have a design safety factor of more than four times the pipe operating rating, and are fitted in the field with a few basic tools. Personnel can be quickly trained to fit Fiberspar connectors.

Can customized end fittings be supplied?

A full range of standard connectors is available for most situations, and Fiberspar connectors can also be custom made to suit any customer requirements in a range of end terminations and materials.

Does Fiberspar LinePipe meet all applicable regulatory standards?

When a spool of Fiberspar LinePipe arrives on location, it has been subjected to the industry's most extensive quality assurance testing and is fully qualified and certified for oil, water, gas or multi-phase service. Fiberspar LinePipe meets or exceeds the most stringent industry specifications, including those for the American Petroleum Institute (API), the American Society of Testing and Materials (ASTM), the Canadian Standards Association (CSA) and the Energy Resources Conservation Board (ERCB), formerly the Alberta Energy and Utilities Board (AEUB), standards. The permitted applications under CSA and ERCB regulations were also expanded for LinePipe to include gas service up to 600 ANSI pressure rating, and H₂S applications where the partial pressure of H₂S does not exceed 7.25 psi (50 kPa). If any Canadian applications need help with filing instructions for LinePipe using a routine pipeline permit under ERCB guidelines, contact Fiberspar technical services in Canada at 403.265.9900.

Does LinePipe design comply with standards such as API 15S and 15 HR?

Yes. Details are contained in the document Fiberspar LinePipe Engineering Guide, which is available online at www.fiberspar.com. In addition, LinePipe meets or exceeds ASTM and ISO 9001 specifications, and the internal specifications of ExxonMobil, Shell, Pemex and other major oil companies.

What are the flow characteristics of Fiberspar LinePipe, and how are they calculated?

Fiberspar LinePipe improves performance by meeting and, in many cases, exceeding the flow rates of conventional steel lines of comparable diameter. That's because the smooth internal thermoplastic pressure barrier of the LinePipe improves flow by reducing frictional losses. In higher flow regimes, the LinePipe's smooth internal surface and the minimal use of connectors also reduce turbulence. Furthermore, the smooth interior surface is highly wear resistant, making improved flow properties sustainable for many years. Fiberspar recommends that a "C" factor of 150 be used in the Hazen-Williams formula for friction pressure drop calculations. Friction flow factors for other commonly used formulas are contained in Fiberspar LinePipe product data sheets available at www.fiberspar.com. Where highly abrasive flow is expected, tests are recommended to establish wear life.

How does LinePipe perform in erosive flow?

Industry testing has shown that thermoplastics provide a generally superior resistance to abrasive fluid flows when compared to steel. In tests performed to date, LinePipe outperformed steel in erosion, but testing of specific fluids would be required to set an exact limit for velocities. Without carrying out specific testing, a conservative approach to erosive flow is to use the same velocity limits as for steel.

What is the operational temperature range?

Fiberspar LinePipe is engineered for a 20-year design life in two operating temperature ranges: -29°F (-34°C) to 140°F (60°C) and -29°F (-34°C) to 180°F (82°C).

Can Fiberspar LinePipe be pigged and what types are suitable?

The product can easily be pigged to dewater, remove deposits and remove blockages, although the design of Fiberspar LinePipe is such that it may never be necessary. The thermoplastic pressure barriers in Fiberspar LinePipe are softer than steel, therefore, aggressive sharp-edged, scraper-type and brush pigs that can damage the ID should be avoided. Only soft and typical low-to-medium foam or urethane cup-type pigs should be used. Fiberspar can supply pigs for your needs, or provide inside diameter information for the pipe and fittings so that your preferred pig supplier can properly size and recommend a pig for your application.

Can LinePipe be used for CO₂ and supercritical CO₂?

In contrast to carbon steel pipelines which are destroyed by corrosive fluids, Fiberspar LinePipe is unaffected by CO₂, or even supercritical CO₂. Since thermoplastics are not completely impermeable, small amounts of CO₂ can permeate through the liner. This permeation is on the order of 0.001% of the total flow, and not normally detectable.

What are Fiberspar recommendations for applications that include cyclic service, vibration and pulsation?

Fiberspar has developed field-proven procedures to ensure the productive flow of its LinePipe remains unaffected in applications where service cycles, vibration and pulsation are present. Applications, such as high-pressure water injection and some oil and gas producers that employ triplex, centrifugal or other types of pumps or operations that induce pressure cycling, may require additional measures to prevent long-term pipe damage or degradation. Applications that will operate on positive displacement or other high-pressure pumps, which also will cycle frequently during the day, must be reviewed to determine if any additional safety factors are warranted. Fiberspar Engineering, however, will provide application-specific advice whenever vibration, pulsation or cycling may be expected.

What are the client and customer contractor responsibilities?

Fiberspar LinePipe arrives on location ready to be installed by some of the industry's most experienced and qualified installation technicians. At the location, Fiberspar furnishes relevant equipment, pipe/fittings, along with highly trained installers and on-site supervision. The client, in turn, provides:

- All dirt work (open and close ditches)
- Backhoe/dozer for deployment
- Off-loading pipe at location
- Loading of empty reels for return to Fiberspar
- All boring and road crossings
- Ensuring line is hydrotested prior to the initiation of production
- Client contractor shall provide assistance to Fiberspar Service Technician for fitting installation and pipe deployment

If, however, the customer prefers to use its in-house crews or designated contractors for installation, Fiberspar can train them in Fiberspar's installation techniques and best practices.

What are the advantages of hydrotesting?

An integral part of the industry-leading quality assurance program of Fiberspar LinePipe is long-term hydrostatic strength testing, which is designed to ensure product integrity for the design life of the system. Every spool of LinePipe is hydrotested at 1.5 X maximum pressure rating before it leaves our factory. Since every foot of pipe delivered to the field has already passed this hydrotest, the follow-up hydrotest after installation ensures any problems associated with handling and deployment are identified and corrected before placing the line in service. This method has proven to ensure long-term, trouble-free installations. In Canada, an 8-hour hydrotest at 1.25 MOP is required before pipeline commissioning.

What is the effect of storage at low temperatures?

LinePipe can be stored at temperatures down to -50°F (-45°C). Precautions need to be taken to ensure that no liquids are left in pipe to be stored where freezing is possible. Expansion of freezing liquids can permanently damage LinePipe. Precautions against very low temperatures such as covering or indoor storage should also be taken.

How long can LinePipe be stored?

Fiberspar has conducted tests proving that LinePipe can be stored on a spool for more than two years with no detrimental effect on the pipe. This is subject to the low temperature provision, and particular care should be taken when storing in freezing temperatures that water does not enter the pipe. When storing LinePipe, the ends should be sealed to prevent rainwater entry.

How does LinePipe stand up to UV light?

The outer layer of Fiberspar LinePipe consists of a non-structural protective jacket which carries a high-performance UV stabilizer. This provides complete UV protection to the structural layer. Testing and field experience have shown that even without this outer layer, sun fading only affects the outermost fiberglass lamina, and has not resulted in any detectable decrease in strength or longevity.

What lengths of spoolable LinePipe does Fiberspar offer?

One of the most pronounced benefits of Fiberspar LinePipe is its arrival from the factory ready for installation in long, continuous lengths, dramatically reducing install time and costs. Fiberspar LinePipe is available in North America in sizes between 2½ in. and 6½ in. Depending on its size, Fiberspar LinePipe is delivered to site without joints or connections in lengths up to 2 miles (3.2 km).

For additional information consult the [Fiberspar Reel Length Table](#) available online within the [Deployment Equipment Tech Note](#).

What are the reel sizes for LinePipe?

Reel sizes are selected depending on the size and pressure rating of the pipe to optimize the quantity on the spool. All LinePipe reels are 8½ ft wide (2.6 m), and are either 12 ft (3.65 m), 14 ft (4.25 m) or 16 ft (4.9 m) in diameter.

How does thermal expansion compare to steel?

While the thermal expansion coefficients are about 30% more than steel (about the same as aluminum), the stresses induced by temperature change on restrained pipe are much smaller than steel because the modulus is much lower. This property can be used to avoid significant thermal movement, for example, by installing the line under very modest tension when cold. Increasing temperature would then merely offset this tension without pipe movement.

What is the minimum operating bend radius?

The allowable operating bending strain for LinePipe is 2% or 25R. The exact allowable bend radius for any design of pipe can be found on the individual data sheets.

Contact us for assistance with your specific requirements, or download the [Fiberspar LinePipe Engineering Guide](#) at www.fiberspar.com.

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