



شركة المشاريع النفطية - PPC

شريك فليكس بايب الكندية - FLEXPIPE

www.ppc.ly

www.flexpipesystems.com



FLEXPIPE®

AGENDA



- 1 Flexpipe Overview
- 2 Composite Pipe Products
- 3 Benefits of Flexpipe
- 4 The Flexpipe Difference



Everything we do starts with safety and quality.

This is not a phrase, but an attitude we bring into the workplace everyday.

Flexpipe complies with the top HSE and quality industry standards organizations.

We are continuously growing and improving our HSE and quality mindset through awareness campaigns, systems, manuals, documentation, and audits.

HSE Vision

An incident and injury free workplace, with no harm to people while protecting the environment.





50K
KMs of pipe
installed



200+

Years of Composite
Engineering
Experience

20+

Years of pipe
in operation
service

20

Countries on 6
continents

30+

Product, applications
and manufacturing
engineers

Over **50,000 KM** of Flexpipe
installed in over **20 Countries**



Flexpipe Product Applications



Energy

- Diesel & Refined Chemicals
- Natural Gas Distribution
- Enhanced Oil Recovery
- Oil & Gas Gathering
- Lithium Mining



New Fuels

- High-Pressure Gas Injection
- Helium Gathering
- Hydrogen*
- Biogas



Water

- Produced Water Disposal
- Frac Water Management
- Water Gathering



Decarbonization

- Steel Pipeline Remediation
- 100% CO₂ Transportation
- Zero Flaring



Product Specifications



3

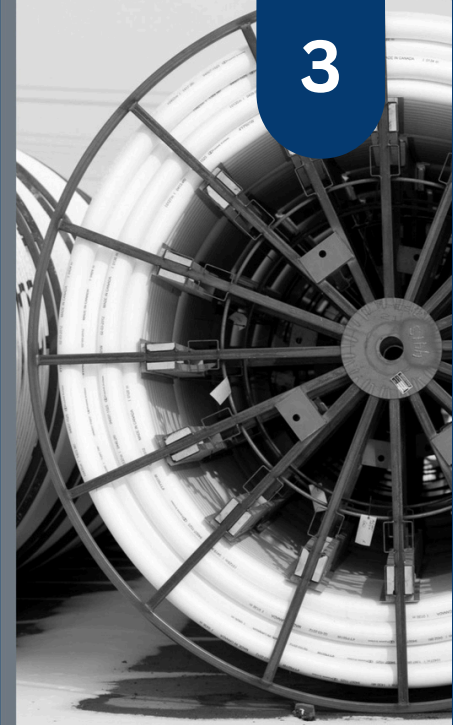


API 15S-0003



	Flexpipe HT	Flexpipe	Flexcord*
Nominal Diameter	2" to 6"	2" to 4"	3" to 4"
Reinforcement Material	Unbonded E-Glass Fiberglass	Unbonded E-Glass Fiberglass	High Strength Steel Cord
Operating Temperature	-29°C to 82°C -20°F to 180°F	-29°C to 60°C -20°F to 140°F	-29°C to 60°C -20°F to 140°F
Pressure Rating	750 to 1500 psi	300 to 1500 psi	2250 psi
Reel Length	350 to 2,000 m 1,150 to 6,560 ft	570 to 2,000 m 1,870 to 6,560 ft	525 to 615 m 1,720 to 2,020 ft

FLEXPIPE *API Monogram testing to the 3rd edition of 15S currently in progress for Flexcord



Joining Systems



Pipe to Pipe
Coupler



Flanged End
Fitting



Weldneck
Fitting

- Industry leading reliability
- Contractor installed fitting
- Pre-assembled flow joint fittings
- Available with electroless nickel coating or in duplex stainless steel

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Over 260,000 fittings installed to date



Crimping pressure is controlled by hydraulic regulation rather than torque application with large wrenches



Crimper dies move independently to allow for variations in pipe wall thickness



API Spec 15S

Spoolable Reinforced Plastic Line Pipe

Background

- Provides requirements for the manufacture and qualification for spoolable plastic reinforced line pipe in oilfield and energy applications.
- Requirements for determining:
 - Pressure and temperature ratings
 - Chemical compatibility
 - Handling and installation limitations

Benefits of the API Monogram

- The product is qualified to exceed operational performance requirements
- Successfully passed a (reoccurring) quality audit
- Has implemented, maintained, and continuously improves a Quality Management System



Global Industry Services
Certification Programs



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Quality Management & Assurance

Quality Management System

- API Spec Q1 or ISO 9001 guide design, materials, qualification and manufacturing
- Full material traceability for finished goods
- Internal and external audits required

Quality Assurance

- Each produced batch of pipe required QA testing
 - Short term burst test
 - Hydrostatic or constant pressure test
- Dimensional checks
- Raw material tests



Benefits of Flexpipe



Lower Lifecycle Costs



Corrosion and Abrasion Resistance



Quick and Easy Installation



Reliability and Traceability



Engineering and Field Support



Lower Environmental Impact



4" Pipeline Cost Comparison

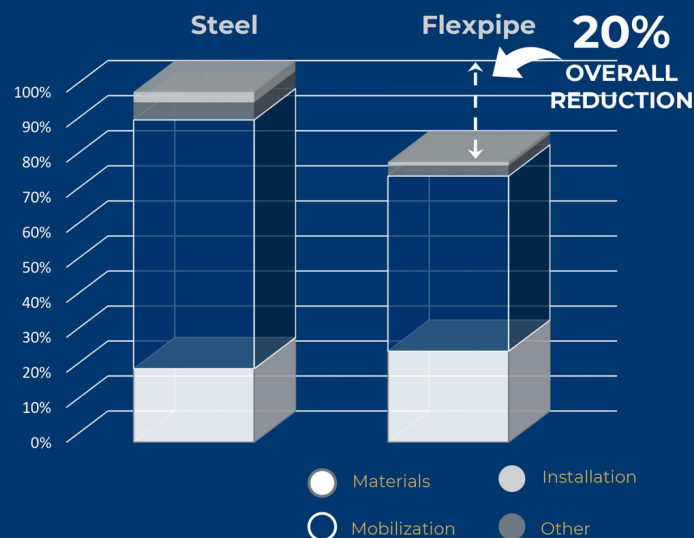
Steel vs. Flexpipe



Overall reduction in project cost compared to steel linepipe

Lower installation cost compared to steel linepipe.

Smaller crew sizes, less equipment, faster deployment.



Flexpipe

Less Manpower and Equipment



4" Spoolable Flexpipe



4" Steel Flow Line

Mobilization	3 Pipe Reels 2 Trucks 1 Track Hoe	98 Joints 4 Trucks 1 Warehouse 2 Track Hoes
Manpower	1 Supervisor 1 Equipment Operator 2 Laborers	1 Supervisor 2 Equipment Operators 2 Welders 2 Welders Helpers 3 Laborers
X-Ray	<i>Not needed</i>	<i>Required</i>
Demobilization	3 Pipe Reels 2 Trucks 1 Track Hoe	3 Trucks 2 Track Hoes 1 Misc. Equipment & Materials



Corrosion Resistance Results in Operating Cost Savings

Spoolable composite pipe presents a significant operating cost savings compared to steel pipe.

- Reduces the requirement for corrosion inhibitors
- For a 20 km gathering system the chemical cost could be **\$20,000 - \$40,000 per year** depending on chemical type and batch frequency
- Cathodic protection installation or maintenance is required



Use of Reinforced Composite Pipe from Canadian Association of Petroleum Producers (CAPP)
https://www.capp.ca/wp-content/uploads/2019/11/Use_of_Reinforced_Composite_Pipe_NonMetallic_Pipelines-300388-.pdf



Life Cycle Cost Savings

Increased Reliability

Lower Incident Rates

- Spoolable fiber RTP has been shown to be the most reliable product in corrosive oil-effluent applications

Smaller Environmental Footprint

- Fewer incidents leads to a decreased impact on the environment

Reduced Operating Costs

- Increased reliability lowers inspection, maintenance and remediation expenses





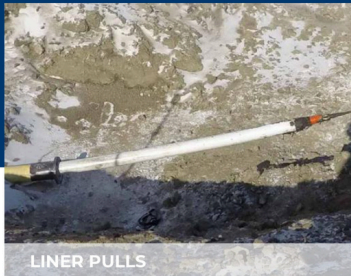
TRENCHING



SURFACE LINES



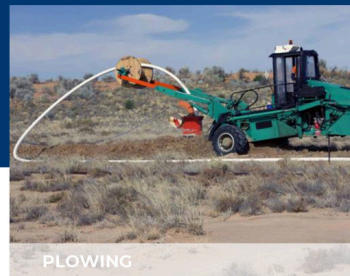
CHAIN DITCHING



LINER PULLS



BORING



PLOWING



Social and Environmental Impact

Low impact to surroundings

Potentially smaller right of way

Less impact on land

Maintain good standing with landowners

Safety

Reduce potential onsite injuries:

Less pipe memory than other composite products

Smaller crews, less manpower, equipment and logistics

Reduce fire potential from grinding, cutting and welding



The Flexpipe Difference



800+
Customers

115+
Certified Contractors

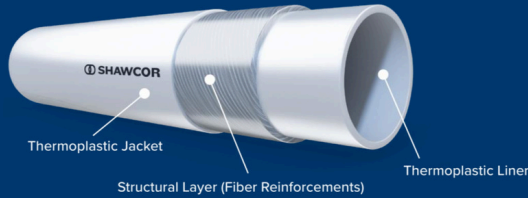
260K+
Fittings installed

50 Million
Meters of installed pipeline (164M ft.)



Carbon (CO₂) Capture

- Proven track record in CO₂ Service
- 100% supercritical or gas phase CO₂
- First project was in 2009 (Alberta Canada)
- 200+ km installed across 8 projects



CO₂ Case Study

Tertiary recovery system using high concentration CO₂

- First CO₂ gathering/transfer lines installed in 2012 using Flexpipe – typical operating pressure of 300 psi
- 55km installed to date in low pressure, high concentration applications
- Beginning in 2013, Flexcord was used for high pressure CO₂ injection lines (30km total installed)
- Concentrations up to 100% at 1500 psi
- 85 km total project length – ZERO incidents or releases



Local Support and Solution Centers Support



Application Engineering

Dedicated resources to ensure the right solution



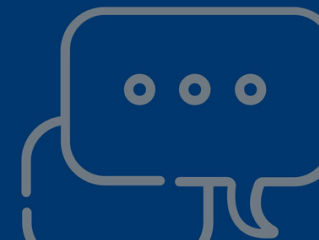
Contractor Development

Annual training for customers and contractors



Local Yards and Staff

Increased control of project timing



"I have never worked with a company that is as organized and knowledgeable about their product and field support."

ALVIN, TEXAS CUSTOMER



Case Study

Composite Adoption

Goal: Minimize pipeline lifecycle cost by reducing capital and the cost of corrosion

Findings:

- Composite pipe was 3x more economical than carbon steel in terms of incremental net present value
- 80% of the work required to build a steel flowline was eliminated
- Significant savings in manpower
- Installed 1,000-4,000m of pipe per day depending on diameter
- Twin 4" had a lower capital cost compared to an internally coated 6" pipe.

"..The ability to install nonmetallic pipe at an accelerated rate significantly improved project schedules... In line with this, nonmetallic materials are mandated for applications in which they have been proven.."

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PPC
Petroleum Projects Company

Conclusions

Non-Metallic RTP is the leading material choice for oil & gas production

API Spec 15S Spoolable Reinforced Plastic Line Pipe

- Qualified to exceed operational performance requirements
- Consistent, high quality products

Installation Savings

- Faster deployment and tie-ins
- Smaller crew sizes with less equipment
- Installation quality management systems reduce errors

Operational Savings

- Reduced chemical costs
- Decreased pigging and maintenance
- Increased performance and reliability



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Operating Cost Savings

HDPE liner has a smoother surface and a lower friction factor compared to steel.

- Reduced paraffin accumulation
- Reduced scaling and fouling
- Reduced pigging requirements
- Higher flow rates
- Lower pumping costs
- Smoothness is retained over time

“...composite pipe is installed to provide increased resistance to the buildup of deposits such as paraffin waxes or scales on the pipe internal surface that can reduce flow and increase pressure drop.”

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FLEXPIPE[®]



May 16, 2024

RE: Flexpipe Representation Agreement with PPC Petroleum Projects Company

To whom it may concern,

Flexpipe, a Division of Mattr Corp. ("**Flexpipe**") is the manufacturer of the Flexpipe products and has authorized PPC Petroleum Projects Company ("**PPC**") to act as its representative in sales of such products within the Libyan market.

Flexpipe reviews the intended applications of its products prior to any order acceptance to ascertain if the intended application is appropriate for its products. As part of that process, Flexpipe will support PPC in reviewing pipe specifications requested by customers and determining suitable Flexpipe products. Flexpipe ensures that installers of its products are trained in correct installation practices and offers a limited warranty in respect of its products.

Should you have any questions, please do not hesitate to contact the undersigned.

FLEXPIPE, A DIVISION OF MATTR CORP.



A handwritten signature in blue ink, appearing to read "Dr. Khaled Mamour".



By:

Dr. Khaled Mamour
Vice President, Oil and Gas International



**American
Petroleum
Institute**



2018-151 | Digital

Certificate of Authority to use the Official API Monogram

License Number: 15S-0003

ORIGINAL

The American Petroleum Institute hereby grants to

FLEXPIPE, A DIVISION OF MATTR CORP.
3501 54th Avenue S.E.
Calgary, AB
Canada

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and AP I - 15S and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram shall be used in conjunction with this certificate number: 15S-0003

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following: Non-metallic Reinforced Pipe -Glass Fiber

QMS Exclusions: No Exclusions Identified as Applicable

Effective Date: MARCH 15, 2024

Expiration Date: APRIL 24, 2025

To verify the authenticity of this license, go to www.api.org/compositelist.

Anchal Liddar

Senior Vice President of Global Industry Services



REGISTRATION NO. Q1-3649

Certificate of Registration

The American Petroleum Institute certifies that the quality management system of

FLEXPIPE, A DIVISION OF MATTR CORP.
3501 54th Avenue S.E.
Calgary, AB
Canada

has been assessed by the American Petroleum Institute and found to be in conformance with the following:

API Spec Q1, 9th Edition

The scope of this registration and the approved quality management system applies to the

Development, Manufacture and Sale of Corrosion Resistant Composite Pipe;
Rental of Specialized Equipment for Installing Fittings;
Provision of Field Installation of High Pressure Connections

API approves the organization's justification for excluding

No Exclusions Identified as Applicable



Effective Date: MARCH 15, 2024
Expiration Date: APRIL 24, 2025
Registered Since: APRIL 24, 2019



Senior Vice President of Global Industry Services

This certificate is valid for the period specified herein. The registered organization must continually meet all requirements of API Spec Q1, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*, and the requirements of the Registration Agreement. Registration is maintained and regularly monitored through annual full system audits. This certificate has been issued from API offices located at 200 Massachusetts Avenue, NW Suite 1100, Washington, DC 20001-5571, U.S.A. It is the property of API and must be returned upon request. **To verify the authenticity of this certificate, go to www.api.org/compositelist.**



تم تركيب أكثر من 50,000 كم من منتجنا
في أكثر من 20 دولة حول العالم

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Saudi Aramco

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FLEXPIPE

جميع منتجاتنا تمتك شهادة الجودة العالية API 15S MONOGRAM



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مقابل الإشارة الضوئية فشلوم
الظهرة طرابلس - ليبيا



البركة شارع النصر مبنى الاستثمار الوطني
الدور الثاني المكتب رقم 203 بنغازي - ليبيا