




**Overview of Spoolable Flexible Steel Pipe:
How FlexSteel is Being Used in Rehabilitation
2018 IDT Expo**

Identifying the Challenges

PIPELINE CHALLENGES

FLEXSTEEL SOLUTIONS

1  **Quality and Safety of Aging Steel Pipelines**



Superior Quality and Proven Performance




2  **New Pipeline Construction and Ongoing Maintenance**



Accelerated Time To Production and Minimal Maintenance



3  **Project Execution**

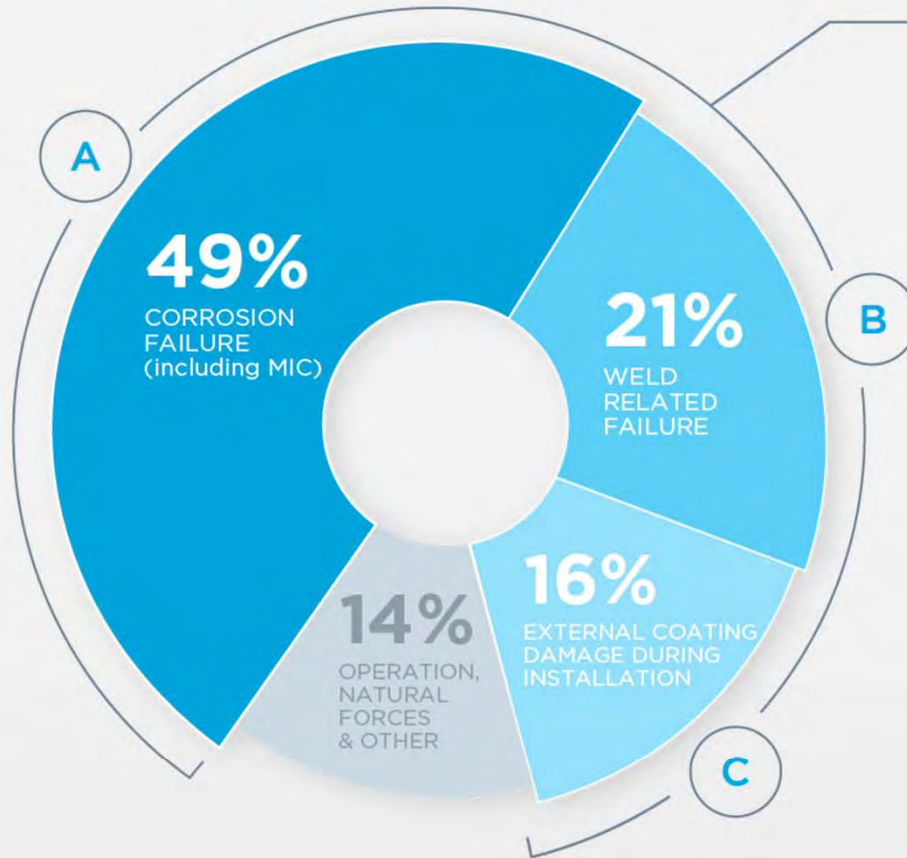


Best Value Solution






Challenge: External and Internal Corrosion

**STEEL PIPELINE
TYPICAL FAILURES**



**FLEXSTEEL
SOLUTION**

-  **A** Corrosion Resistant Pipe & Fittings
-  **B** Proven Swaged Connection
-  **C** ShieldSure™ Annulus Test



FlexSteel line pipe is tailored to address historical steel pipeline failures

FlexSteel is a spooled pipeline technology that uniquely combines the corrosion resistance and installation advantages of flexible pipe with the durability and performance of steel.



FlexSteel line pipe is engineered for quality and performance...

FlexSteel Line Pipe Offering

DESIGN PRESSURE RANGE

750 PSI to 3000 PSI

OPERATING TEMPERATURE RANGE

- 40°F >>> 150°F >>> up to 194°F

**15S-0001** | **17J-0018** | **Q1-3633**

2 in.

3 in.

4 in.

6 in.

8 in.

**...and is designed according to API 17J and 15S standards**

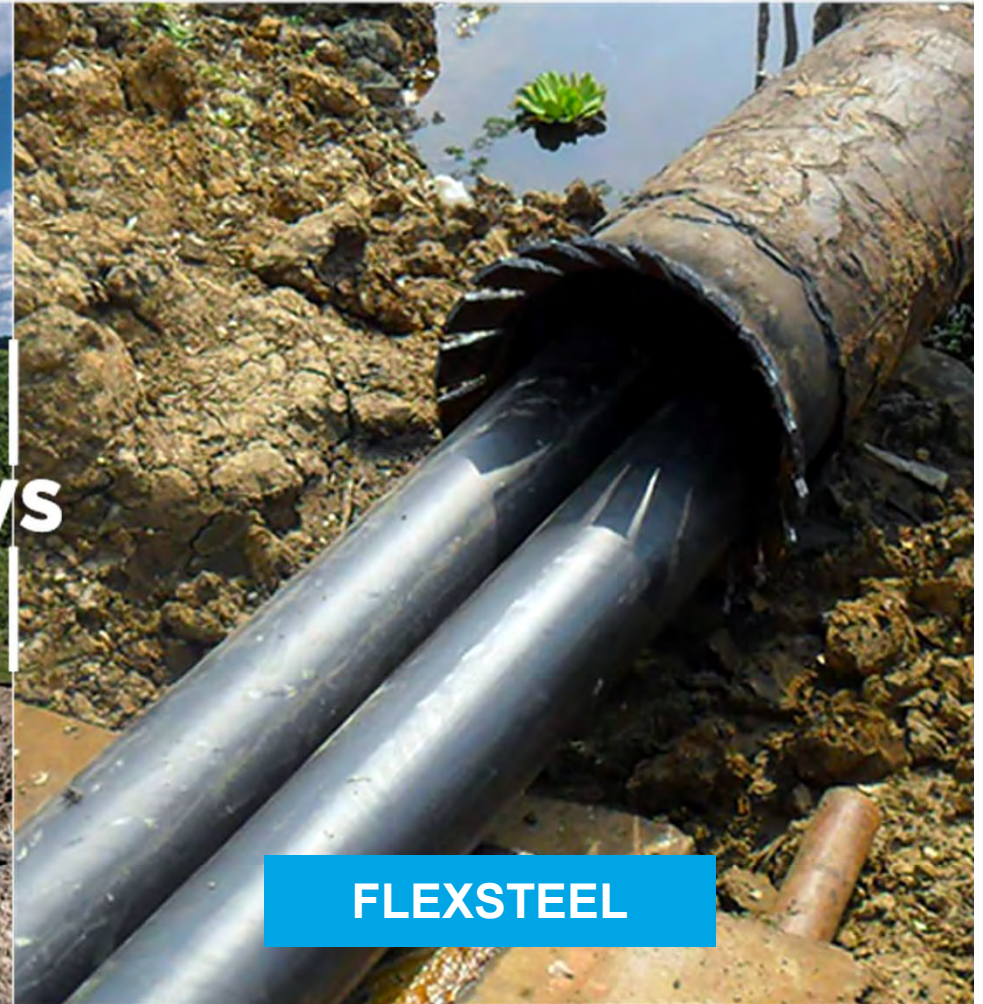


FlexSteel designs and manufactures its connections for complete quality control and superior performance



STEEL

VS



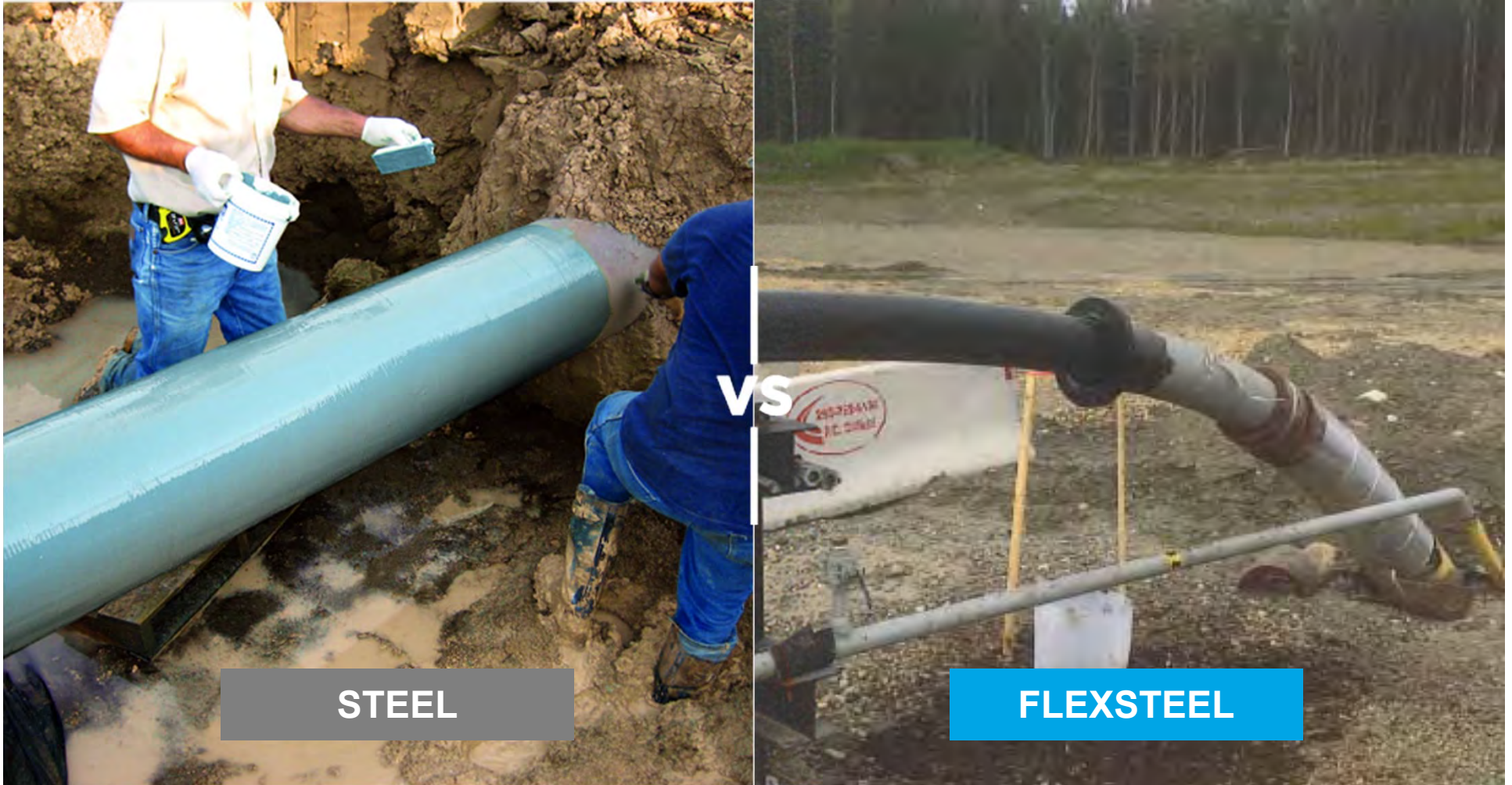
FLEXSTEEL



FlexSteel pipe is fast and easy to deploy and allows up to 4 km of pipe to be installed in a single pull through aged steel pipelines

2. New Pipeline Construction vs Pipe Rehabilitation

No Welding and No Bending



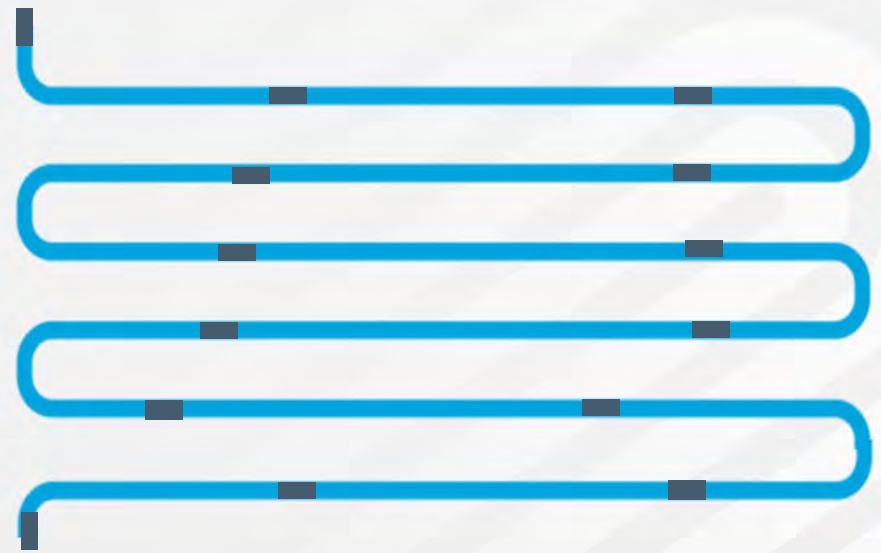
Significant speed and cost savings due to fewer installation steps

Far Fewer Joints – No Welding

Sample 5 mile 8-Inch Pipeline Project



STEEL: 660 WELD JOINTS



FLEXSTEEL: 20 CONNECTIONS

□ WELD JOINTS
■ FLEXSTEEL PIPE CONNECTIONS



FlexSteel connections require 640 fewer joints than steel pipelines

Project Profile – The Netherlands



Location: The Netherlands

Pipe Design: 8 inch 1,500 psi

Pipe Length: 28 miles (45 km)

Application Use: Produced Water

Installation: Rehabilitation

Project Profile – The Netherlands

Schoonebeek Field

Oil Produced 1940s – 1990s

Steam Injection EOR - 2013

Produced Water Piped to Twente



Project Profile – The Netherlands

Leak Discovered April 2015

Microbiologically Induced
Corrosion (MIC)

Transport Line Shut

Oil Production Ceased



Pipe and Installation Details

8-inch 1500 psi FlexSteel Pipe

600 ft Continuous Lengths

3000 – 6000 ft Pull Lengths

Pad Size: ~60 ft x 120 ft

Pit Size: ~25 ft x 60 ft



Complex Project – No Problem!

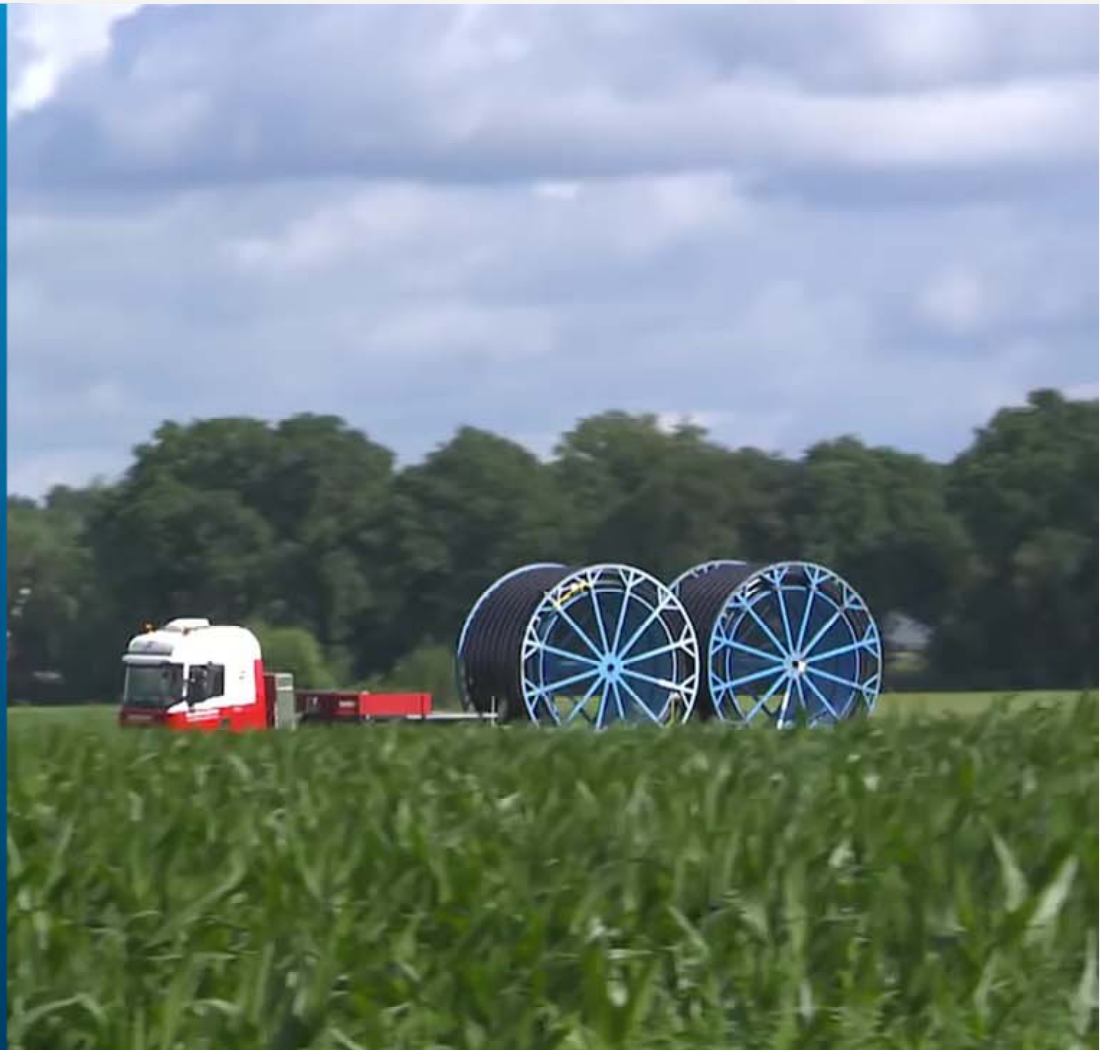
30 Miles of Pipeline

62 Pulling Pits

107 Landowners

260 Reels and 275 Connectors

2,500 Freight Transports



Meeting the Challenge

Construction Time: 5 Months

Meets Dutch Regulations

Production Resumed Sept. 2016

2016 ISTT No-Dig Award





**SUPERIOR QUALITY AND
PROVEN PERFORMANCE**



**ACCELERATED TIME
TO PRODUCTION AND
MINIMAL MAINTENANCE**



**BEST VALUE
SOLUTION**

Increase and accelerate the reliable, safe adoption of spoolable reinforced plastic line pipe by:

1. Guiding & targeting industry testing & technical work,
2. Educating the industry, and
3. Influencing regulatory adoption and incorporation into regulations

Join at:

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**SPOOLABLE PIPE
USERS GROUP**



FLEXSTEEL

www.flexsteelpipe.com