THE TITE LINER® SYSTEM

Pressure pipe rehabilitation systems for municipal water and wastewater applications

Much of the world's pressure pipe infrastructure is long past its design life or is in need of repair. Complete replacement of these pipes using conventional dig and replace solutions can be time consuming, costly (up to 3 times the cost of insitu rehabilitation) and very disruptive to traffic, the general public and the environment. These problems can easily be avoided by choosing the Tite Liner® system—a close-fit, high-density polyethylene (HDPE) solution for pipe renewal.

The Tite Liner® system is ideal for the renewal of distribution and pressure mains. The Tite Liner® system installation cuts down on digging and disruption while helping water companies and municipalities extend the life of their existing infrastructure. The continuous HDPE liner is installed with a close fit against the inner wall of the host pipe after temporarily reducing the liner diameter using our proprietary roller reduction processes.

The HDPE liner isolates the flow stream from the host pipe wall, eliminating internal corrosion and improves flow capacity by up to 50% by maximizing flow characteristics and reducing annular space and friction.

The Tite Liner® system provides solutions for your pressurized pipe system

- Nominal diameter ranges from 2 to 54 inches and higher
- Produces a continuous, close-fitting solution. Semi-structural or fully structural solutions available.
- Drinking water approved NSF 61
- Can navigate minor bends or miters
- Utilizes high-performance HDPE 4710
- Fast and cost-effective installation
- Maintenance-free solution
- Extends the life of existing assets
- United's powered roller box technology allows for the longest possible installation methods with lowest possible installation forces. Pull lengths of 8,000 feet have been achieved.

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The Tite Liner® system utilizes PE 4710 and offers a cost-effective and dynamic solution compared with historical materials

- Engineered liner provides a custom fit and performance while minimizing material cost
- Improves performance properties including long-term pressure rating, tensile strength and toughness
- Increased resistance to slow crack growth propagation
- Allows for the use of standard IPS or DIPS connections
- Can be repaired or modified for future needs
- Close-fit eliminates the need for grouting

Testing and Certification

The following third-party tests have been performed on the Tite Liner® pipeline renewal system:

Industry Standard	Application
ASTM D 3035	Pressure and non-pressure fluids, municipal and industrial water, sewer and culvert, rehabilitation, geothermal, heat transfer
ASTM F 714	
AWWA C901	Water service and distribution
AWWA C906	Water distribution and transmission
FM1613	Underground fire main
NSF 61 and 14	Potable water
AASHTO M-326	Sewer and culvert sliplining
CSA B137.1	Potable water

Sample Municipal Installations

Village of Valley Forge, PA
Sanitary sewer
- 18,000 LF of 30 in
- DR 32.5 and DR 26

City of Laramie, WY
Potable water
- 95,000 LF of 20 in Tite Liner®
- DR 32.5

City of Richardson, TX
Sanitary sewer
- 4,000 LF of 12 in
- DR 26

City of Manhattan, NY
Potable water
- 10,000 LF of 48 in
- DR 40

City of Victoria, BC, Canada
Potable water
- 11,000 LF of 24 in
- DR 32.5

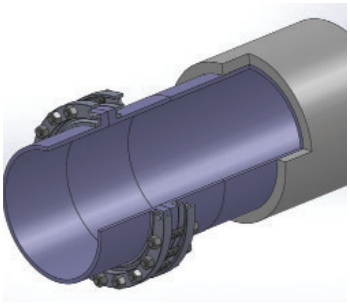
City of Greeley, CO
Raw water
- 5,000 LF of 20 in Tite Liner®
- DR 21

AWWA Class IV Tite Liner® System Technical Envelope

Diameter (in)	Standard DR	Max Operating Pressure Rating (psi)	Max Hydro Test Pressure (psi)
6	9.00	252	378
8	9.00	252	378
10	9.00	252	378
12	9.00	252	378
14	11.00	202	303
16	11.00	202	303
18	13.50	161	241
20	13.50	161	241
22	15.50	140	210
24	15.50	140	210
26	17.00	126	188
28	17.00	126	188
30	17.00	126	188
32	17.00	126	188
34	17.00	126	188
36	17.00	126	188
42	21.00	101	151
48	21.00	101	151
54	21.00	101	151

Values above are guidelines only and may not apply in all situations.

End Connections and Fittings



The Tite Liner® system is suitable to connect to all types of piping systems (DIP, CS, PCCP, AC, HDD, etc). Fittings, valves and miters can be accommodated with HDPE, DI, CI or other materials and bolt directly to the Tite Liner® system.

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United Pipeline Systems, Inc.
135 Turner Drive
Durango, CO 81303
970.259.0354
www.unitedpipeline.com
ups@unitedpipeline.com