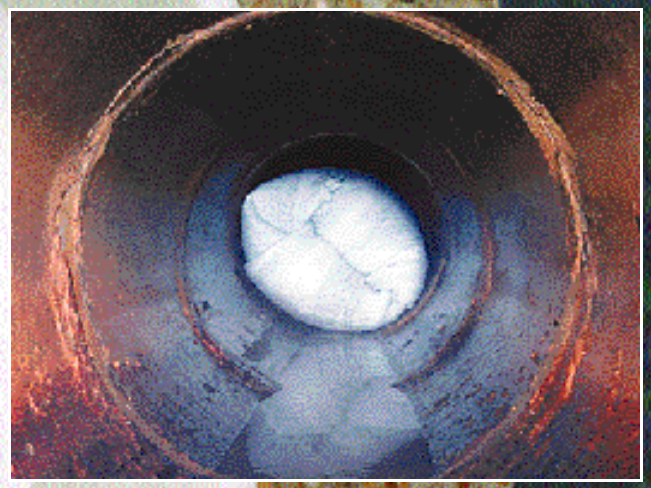
National Liner

Cured-In-Place Pipeline Rehabilitation
& Unmatched Product Performance.

Cured-In-Place Pipeline Repair:

A Time-Tested, Proven Pipeline Rehabilitation System

For more than 30 years, Cured-In-Place Pipe (CIPP) has proven to be one of the most cost-effective methods of repair to damaged and corroded pipelines. Thousands of installations and millions of feet of later, CIPP remains the leader and the preferred method of trenchless repair of municipal and industrial sewer lines. Its strength, life expectancy, chemical resistance and non-disruptive installation have revolutionized the pipe rehabilitation industry.



The Product: National Liner®

National Liner consists of two primary components. The first is a precisely fabricated, non-woven and needled polyester felt liner. The second, a thermosetting resin, thoroughly saturates the liner during the manufacturing process.

National Liner is not limited in diameter or wall thickness and can be specifically manufactured for pipelines ranging from 6" to 84" in diameter. It also has a 50-year design life and economically restores damaged pipelines to their original specified operating efficiencies.

The Benefits:

A Long Term, Trouble-Free Pipeline Rehabilitation Solution

In addition to strengthening the host pipe and halting the infiltration of ground water, the physical properties of National Liner resist corrosion and abrasion caused by effluents. Upon project completion, National Liner's smooth inner surface actually increases the flow capacity of the pipe and helps reduce turbulence. Here are a few more reasons why you should specify National Liner:

Performance and Testing:

- Meets or exceeds installation standards per ASTM F-1216
- Flexural Modulus of Elasticity exceeds 250,000 psi per ASTM D-790
- Flexural strength exceeds 4,500 psi per ASTM D-790
- Tensile Strength exceeds 3,000 psi per ASTM D-638
- Meets or exceeds Resin Corrosion Testing per ASTM C-581
- Meets or exceeds 50-year design life criteria per ASTM D-2990
- L.A. Greenbook qualified
- All material components produced in ISO 9002 certified facilities

Product Features:

- Can repair damaged pipelines made from any material
- Negotiates bends and transitions in both size and shape
- Spans missing sections, cracks and offset joints
- Jointless construction eliminates root intrusion and groundwater infiltration
- Fits tight, allowing for a mechanical lock into existing pipe
- Strengthens pipes weakened by cracks and corrosion

Engineered Pipeline Rehabilitation System:

The science of Cured-In-Place Pipe has been long studied and well documented. National Liner is a proprietary system of trenchless pipeline reconstruction and is manufactured and installed to meet individual project specifications.

Critical to any National Liner installation is the use of accurate design data. National Liner offers free *Engineering Design Software* on its website (www.nationalliner.com). This online program allows you to input your design criteria to determine the CIPP liner design thickness specifications for your project.

Experienced & Qualified Contractors:

Another key ingredient to a successful installation is the contractor. Since it is a proprietary product, National Liner can only be installed by licensed, trained and experienced utility contractors. Each contractor in the National Liner network has been carefully selected to ensure each project is completed on time, on budget and mistake free.

The Process:

Fast, Simple & Non-disruptive Installation

1. After the host pipe has been cleaned, the resin impregnated softliner is readied for insertion into the pipeline from an upstream manhole.

2. The liner is inverted or winched into place, then expanded using a hydrostatic head of water, air or steam pressure to press it firmly against the interior of the host pipe. During this process, excess resin is forced into cracks, joints and irregularities of the host pipe resulting in a permanent bond between new and old pipe.

3. Heat is then introduced throughout the liner to cure (polymerize) the resin. Once cured, a new structural pipe is formed within the damaged host pipe.

4. After the cure is complete, lateral lines are re-opened using a remote controlled cutting tool. The pipeline is then video inspected to insure it meets owner specifications.

National Liner

www.nationalliner.com

National Envirotech Group • 12707 North Freeway • Suite 592 • Houston, Texas 77060 • 281-874-0111