PURIS

STATEMENT OF QUALIFICATIONS

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PURIS

VALUE

Our trenchless rehabilitation offerings **minimize disruption** to the public by reducing noise, traffic disturbances and road repair - and can be done within a **far shorter time frame, at less cost** than dig and replace.

- Lower cost
- Lowest risk
- Less disruption - no closures
- Service life of 100+ years
- Proven technologies
- Faster installation
- Minimal to no digging

SOLUTIONS

- Mainline CIPP
- UV-Lining
- Waterline & Pressure Pipe Renewal
- Geopolymer Lining
- Manhole Renewal
- Static Pipe Bursting
- Pre-chlorinated Pipe Bursting
- Compression Fit HDPE Pipe Lining
- Slip Lining

COMPANY **OVERVIEW**

PURIS provides end-to-end water infrastructure renewal solutions, specializing in environmentally sustainable trenchless pipeline rehabilitation. PURIS is U.S.-based and vertically integrated. We perform turn-key installation services providing owners with a single source solution for all of their water infrastructure renewal needs. Our technologies operate within the existing infrastructure to minimize environmental impact and reduce community disruption.

We are committed to investing in new product development and partnering with leading-edge technology companies to offer our customers the best solutions for their projects, budgets, and environmental conditions. Our solutions, proven service model, and 1,000-member strong workforce are focused on solving our communities water infrastructure challenges with minimal environmental impact.

Our goal is to have as positive of an impact above ground as we do below it.

FAMILY OF COMPANIES

WASTEWATER

inliner SOLUTIONS — A PURIS COMPANY
iwpc — A PURIS COMPANY
pmc — A PURIS COMPANY
liquiforce — A PURIS COMPANY

WATER

MPC — A PURIS COMPANY

MANUFACTURING

Liner Products

Mainline CIPP

Product **Highlights**

- Limited or no excavation required
- Up to 120” in diameter
- Improves hydraulic capacity of existing pipelines
- Design life that exceeds 50 years
- Economic alternative to open cut replacement

Inliner® Cured-in-Place Pipe
Our most widely used solution is our proprietary Inliner Cured-in-Place Pipe. CIPP is a proven, cost-effective no dig solution for problems normally associated with leaking or deteriorated pipelines.

Installation
An Inliner crew will oversee the cleaning and televising of the existing pipeline to determine exact pipe diameters and pipe condition. The crew will then order a lining tube that is custom manufactured for the project and delivered to the jobsite, ready for installation. These tubes are designed as a fully structural pipe or can serve as an interior infiltration barrier only.
Immediately following a second thorough pipe cleaning, the crew will install the resin-saturated liner via manholes or other designated access points using one of two proven methods: direct inversion (ASTM F1216) or pulled in place (ASTM F1743).

Once the liner is in place, the workers apply hot water, steam, or UV light to cure the segment. The length of time required for this process is dependent upon diameter and length, but is typically achieved in a matter of hours. Crews then cut the ends, reinstate the customer lateral services from inside the pipe, and active use of the renewed pipeline can begin.

The Importance of a Proper Cure
In addition to continual monitoring of temperature readings at boiler trucks, our team has implemented new fiber optic monitoring technology. Where earlier efforts provided readings at intervals of 200 to 300 feet using thermocouple measuring devices at manhole access locations, our thermal imaging system now enables the monitoring of the curing process along the entirety of the pipe run at 6-inch intervals.
These readings can be monitored remotely by the project manager at an off-site office location, further ensuring a successful installation.

Benefits for Our **Customers**

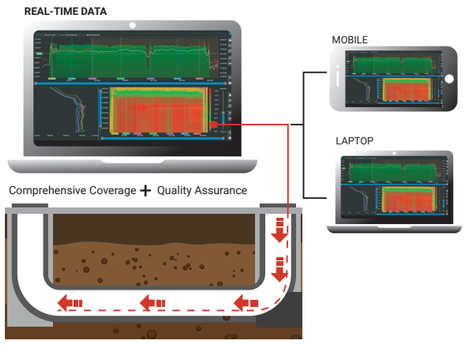
With our no-dig CIPP technology, a crew with a modest amount of equipment can install a durable new pipe directly inside the existing worn or damaged pipe without breaking ground. In all but the most extreme cases of deterioration or collapse, Inliner CIPP can fully restore pipelines up to 120 inches in diameter with an additional service life of 50 years or more.

ASTM F1216

Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of Resin Impregnated Tube

ASTM F1743

Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe



UV-Cured CIPP Lining

Product **Highlights**

- Fiberglass-reinforced tubes with styrene barrier
- Reduced wall thickness design; added strength
- Suitable for gravity, pressure, and water
- Small carbon footprint
- Six-month shelf life of resin-saturated tubes
- Pipes ranging 6” to 64”

While traditional felt-based liners continue to offer reliable solutions in today’s marketplace, fiberglass UV-cured liners can be a valued alternative.

Installation
After thoroughly cleaning the host pipe, installation crews pull the UV liner into place. A protective sliding film or glide foil can be used in significantly deteriorated lines to aid in the pull-in process and to further protect the liner. Both ends of the liner are then sealed with protective end caps and air pressure is introduced, allowing the liner to expand into place. Workers then run a UV light train through the line at a controlled, pre-configured speed of up to 6 feet per minute to cure the liner.

Cameras on the train allow for viewing of the alignment and fit—both before and during the cure process. This computer-monitored process collects and stores data relevant to temperature, pressure and rate of conveyance to ensure proper curing of the installed liner. When complete, the laterals can be reinstated using a remote-controlled cutting unit or via man entry in larger diameter pipelines.

Benefits for Our **Customers**

UV-cured CIPP provides all the benefits of our thermal-cured product with some additional perks. Our proven UV-cure lining technology has a design service life of 75 or more years, is eco-friendly, several times stronger, and provides increased hydraulic capacity over traditional CIPP. A pre-cure inspection ensures the installation is flawless, and there is virtually no on-site styrene odor.

ASTM F2019

Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic Cured-in-Place (GRP-CIPP) Using the UV-Light Curing Method

Water and Pressure Pipe

Product **Highlights**

- Epoxy is applied using mobile saturation technology
- Certified for drinking water
- Capable of internal connection reinstatements
- Flexible for moderate alignment deflection
- Extensive pressure range
- Resin saturation in a controlled manufacturing facility

Water & Pressure Pipe Applications
We offer several options for renewing pressurized potable water and wastewater systems. Inliner utilizes both a pressure rated, pulled-in-place glass reinforced plastic (GRP) tube cured by UV-light and a glass reinforced felt tube composite installed by the inversion method and cured with heat (steam or water).

Heat-Cured CIPP
Similar to CIPP applications for storm and sanitary sewers using the inversion over-the-hole method, our teams saturate the reinforced tube on-site per ASTM F2994 with epoxy or resin for immediate inversion into the pipe. Liner curing is completed using hot water or steam.

UV-Cured CIPP
This technology utilizes a GRP tube that is saturated with resin at the manufacturing facility prior to delivery, and is pulled into place and cured by exposure to UV light. The instrumentation of the UV light train allows for an internal pre-cure QA inspection of the liner prior to activating the UV lamps.

Benefits for Our **Customers**

We recommend a variety of glass-reinforced pressure pipe lining solutions for both potable water and wastewater uses.

ASTM F2994
Standard Practice for Utilization of Mobile, Automated Cured-In-Place Pipe (CIPP) Impregnation Systems

ASTM F2016
Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of Resin Impregnated Tube

ASTM F2019
Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic Cured-in-Place (GRP-CIPP) Using the UV-Light Curing Method

Geopolymer Applications

Product **Highlights**

- Monolithic mineral polymer with ceramic properties
- Single-pass applications
- Adheres to any structure surface
- Eco-friendly; composed of over 50 percent recycled materials
- Ideal for large-diameter pipes

Installation
Using a spin caster or low-pressure hand-sprayer, our crews apply a consistent and evenly coated layer of geopolymer material from the top to bottom of the structure. Following the coating, crews use trowels to smooth out the finish. Once applied to the damaged or deteriorated surface, the geopolymer material quickly forms into a crystalline structure for higher resistance to acids, lower porosity and greater surface durability.

Inliner site crews can complete preparation and installation for each segment in the same day, eliminating lead time for ordering materials. Typically, the application of the geopolymer coatings require one pass, in the range of thickness of .5" to 1.5", with a maximum thickness of approximately 3". The quick cure rate shortens bypass time and allows flows to be re-established much quicker than Portland cement-based mortars.

GEOPOLYMER

Exceptional Strength	Cost Effective
Can be Applied in One Pass	Strong Bonding & Durability
Eliminates Excavation & Utility Locates	Chemically Resistant

Benefits for Our **Customers**

Geopolymer applications are ideal for large-diameter pipelines and are an eco-friendly solution, composed of more than 50 percent recycled materials. Site prep and installation can be completed in a single day per segment, with no material lead time.

Lateral Lining

Product **Highlights**

- Laterals 4” to 6” (100-150mm) in diameter
- Mainlines 8” to 36” in diameter
- No bypass or cleanout required
- All work completed through existing manholes
- Custom CIPP lining tubes
- Liner is ambient-cured

Installation
Preparation is a critical part of our lateral lining installations. Our PFM (Prep-From-the-Main) tools are inserted into the lateral from within the mainline sewer to remove the roots, calcite, blockages, obstructions and other debris. The PFM uses a combination of reamers, flushers, nozzles, and CCTV cameras to clean the laterals through remote means.

The PFM tools also consist of a remote measuring process for determining the diameter of a lateral at every point along its length. This allows our teams to build a customized CIPP liner for a specific residence or business address. The PFM does not require a bypass of the mainline sewer, cleanout access or residential access to facilitate the process. All work is completed through existing manholes in the municipal right-of-way.

Inliner’s Measure from the Main (MFM) process utilizes a linear variable displacement transducer (LVDT) to transmit data back to the control system. Running hundreds of diameter checks per linear foot, the LVDT system averages the sizing and determines the appropriate lateral tube sizing for manufacturing.

The liner is ambient-cured and does not require other energy sources such as hot water or steam to achieve full cure.

Lateral reinstatement is not needed with the junction liner installation process. Once the liner is installed, the installation bladder is removed and the line is placed back into service.

Benefits for Our **Customers**

Our lateral lining renewal eliminates root growth in pipelines, improving the hydraulic characteristics while mitigating infiltration and inflow issues. Our process allows for installation without cleanout or bypass, and the liners are ambiently cured with no need for artificial heat or light.

Manhole Renewal

Manhole Renewal Applications
We perform manhole renewal installations using both Cured-in-Place Manhole (CIPMH) and a variety of cementitious, epoxy-based applications.

Our NASSCO-certified superintendents provide extensive manhole inspections, which is the first step in determining the best application(s) for improving sewer system performance. These comprehensive inspections provide a concise evaluation of the state of the structure, spanning from the cover/frame to the bench and base.

Benefits for Our **Customers**

Whether cementitious, epoxy, or CIPMH application, we will recommend the right trenchless manhole rehabilitation solution, including specifying mixture additives to address specific structural or chemical concerns. Manhole renewals are completed quickly, with a single crew performing three to seven installations per day.

CIPMH Product Highlights • Engineered for a service life of 50 years • Restores structural integrity, eliminating infiltration and inflow • Cured-in-place seal creates a watertight, corrosion-resistant structural lining, resisting freeze and thaw conditions • Each crew can complete 3-7 installations per day	**CIPMH Installation** Our CIPMH liners are customized to fit manholes and related structures constructed of brick and mortar, pre-cast concrete or block. Inliner crews can complete preparation and installation in the same day, eliminating lead time for ordering materials. The liner will cure under ambient temperature and pressure in one to two hours.
Epoxy Product Highlights We also provide epoxy-based solutions. Epoxy products offer great advantages in adhesion, chemical resistance and structural renewal strength.	**Epoxy Installation** Prior to applying the epoxy product, the Inliner team performs a visual assessment of the manhole structure, then cleans the surface using water blasting. Cracks and damaged areas are patched, and if the damage is severe, a cementitious underlay is applied. The epoxy is applied with a hand-spray gun with a technique called cross-hatching, or “boxing,” to ensure even coverage and thickness. Final thickness can range from 80-125 mils or more per application.

Pre-Chlorinated and Static Pipe Bursting

Product **Highlights**

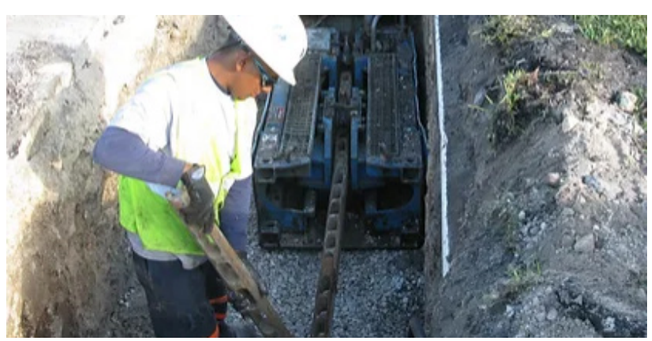
- Eliminates need for temporary water services
- Disinfected and tested above grade
- Pipe installation completed in a single day
- 2-inch through 36-inch diameter

Pre-chlorination eliminates the need for temporary water services. The High Density Poly Ethylene (HDPE) pipe is bacteriologically disinfected and pressure tested above grade prior to installation, allowing it to be placed into service immediately after installation.

The method utilizes HDPE pipe and entails the pre-assembly and testing of approximately 300 to 600 foot lengths of pipe above grade at a nearby staging location. This work is completed in advance of pipe bursting operations. Once the pipe string is proven to be sound by the testing and disinfection procedures, bursting operations can begin. In the area of water main being replaced, a series of small excavations are made and the new pipe is pulled into place by pipe bursting the existing main. A post-chlorination and flushing of the main is then performed and the new line is connected into the distribution system.

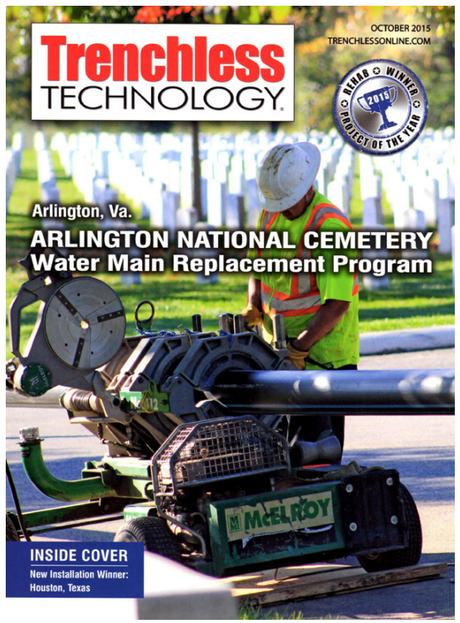
Ultimately, all services are connected into the new main and the surface area is backfilled to preconstruction grade. The entire process is completed within a single day, 6 to 8 hours, thereby minimizing the disruption to area residents.

Residents connected to the main being replaced that day only experience a 6- to 8-hour interruption in water service before being reconnected. Crews typically begin preparations around 7 a.m. and by noon the new pre-chlorinated HDPE is in place. Between 3 p.m. and 4 p.m., residents are reconnected to the water system. At the end of each day, pits are backfilled to grade. By the end of each week, a restoration crew completes final grass and road restoration.



Benefits for Our **Customers**

- Existing utility path followed (requires limited design)
- 92% less excavation vs. open cut
- Reduction in community impact
- Limited noise and dust
- No traffic disruption
- Residents drive in/out of driveways
- Water service maintained with temporary by-pass
- Expedited project schedules
- Increase pipe diameter up to two times larger



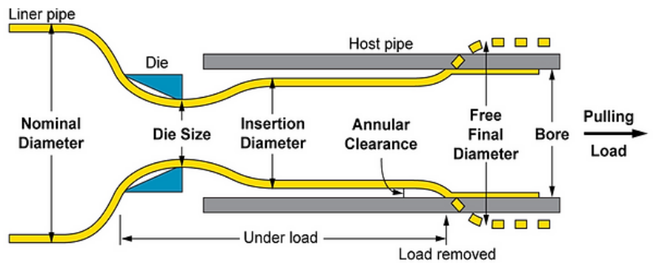
CompressionFit™ HDPE Pipe Lining

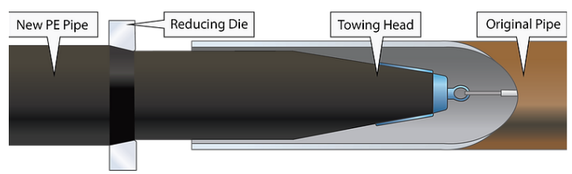
Product **Highlights**

- Increased Flow Rates over Slip Lining
- Tight fitting HDPE provides maximum Internal Diameter allowing greatest flow
- Smooth wall of HDPE (150 C-factor) reduces friction and pumping costs
- No grouting required due to compressive tight fit of new HDPE

Governed by ASTM F3508, the Compression Fit HDPE pipe lining technology specifies an HDPE pipe with an outside diameter larger in size than the inside of the host pipe to be renewed. After the HDPE is butt fused to correspond to the pull distance, the pipe is pulled through a reduction die immediately before entering the host pipe. This reduces the HDPE pipe temporarily below the ID of the host pipe allowing it to be inserted.

While the towing load keeps the HDPE under tension during the pull, the pipe remains in its reduced size. The HDPE remains fully elastic throughout the reduction and installation process. After installation, the pulling load is removed. The HDPE pipe expands until it is halted by the inside diameter of the host pipe. The effectively natural 'tight' or 'compression fit' is accepted as exchanging an existing failing pipeline with a composite pipe in its place.





Benefits for Our **Customers**

Solution to the Problem
- Fully structural HDPE can be installed if the host pipe has no integrity
- Semi-structural HDPE can be installed if the host pipe has some integrity, yet increase strength, span holes and provide corrosion protection
- Thin walled HDPE can be installed if the host pipe is sound, but joints are leaking or corrosion protection is required

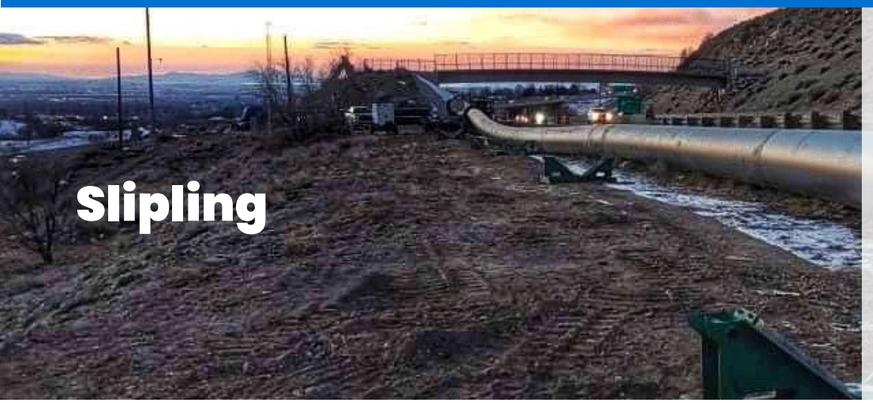
Minimal Schedule and Impact
- Production rates of up to 5,000 feet in a single pull
- 91% less excavation than open cut

Superior Long-Term Design Life
- HDPE has a design life in excess of 100 years, unlike short term fixes

Existing Utility Path Followed
- No available easement? We won't need one
- Design hours reduced as utility relocates are irrelevant

ASTM F3508

Standard Practice for In-Situ Pipeline Re-Construction As Coupled Dual-Wall Composite Pipeline by Push/Pull Installation



Slipling

Product **Highlights**

- Proven technology
- 2-inch through 100-inch or more diameter water & sewer forcemain replacement
- Pre-fused pipe lengths
- Installation distances up to 5,000 ft

Sliplining is completed by installing a smaller, carrier pipe into a larger host pipe, grouting the annular space between the two pipes, and sealing the ends. The trenchless method is generally a cost-effective rehabilitation method to replace water and sewer force mains.

Sliplining is one of the oldest forms of trenchless technology. The most common material used to slipline an existing pipe is high-density polyethylene (HDPE).

Continuous sliplining uses HDPE pipe that is fused into long lengths prior to installation. The HDPE pipe is pulled through the existing host pipe starting at an insertion pit and continuing to a receiving pit. Long installation distances of up to 5,000 feet are possible.

Potential limitations are the new pipe will generally have a reduced cross sectional area due to installing a smaller sized pipe, thus reducing flow rates and capacity. Hydraulic calculations need to be considered.

For pipeline projects that need to maximize final Internal Diameter, CompressionFit HDPE pipe lining can add value over sliplining.

Benefits for Our **Customers**

- The slipling process uses the old pipe to protect the newly installed pipe.
- This method is cost effective and can be completed in a shorter time frame.

Liner Manufacturing

Liner Products® is a Inliner-owned liner manufacturing operation that provides reliable and high-performance CIPP products to installers throughout the U.S. These products include tubes for inversion and pull-in-place methods for mainline CIPP, calibration hoses, lateral liners, and pre-liners where required.

Our meticulous standards and our Paoli, IN manufacturing facility's ISO 9001 certification assures installers and owners alike, that they will receive a final product that consistently performs beyond expectations. Liner Products can manufacture liners in diameters of 3" to 120" and can produce them in varying thickness levels based upon design conditions.

Rigorous specifications established in-house and throughout our supply chain ensure quality for all components that go into our material (including raw felt and a variety of tube coatings). Working closely with other industry professionals, Liner Products can provide solutions for the most difficult installations along with more traditional projects. Tubes can be heat-bonded or steam-stitched, fiber-reinforced or straight polyester and even transition from one diameter to another in the same run.

This vertical integration and quality assurance within our CIPP offerings allows us to work closely with our customers to ensure consistent products and exceptional service while meeting recognized industry standards including ASTM D5813, ASTM F1216, and ASTM F1743.

Liner Products®

LEADING A CULTURE OF SAFETY

At PURIS, we strive each and every day to prevent incidents that might otherwise cause harm to our workforce, the general public, or the environment.

Our goal is to protect our biggest assets, our people, and our communities, by promoting an injury-free and incident-free workplace. Employees at every level of our organization are empowered to take ownership of their own safety and promote a “see something, say something” safety culture.

BUILDING STRONGER, SUSTAINABLE COMMUNITIES

Millions of Americans benefit from renewed water mains, sewer, and storm drain infrastructure. Stronger, more efficient water systems restore efficiencies that have been lost over time. By improving the reliability of these systems, PURIS can help communities save millions of gallons of water. More efficient wastewater systems also prevent contaminated runoff from leaching into the ground and polluting waterways, further protecting the health and vitality of people and communities.

RENEWING AGING UNDERGROUND INFRASTRUCTURE

With more than 2.2 million miles of sewage lines and 1.8 million miles of potable water infrastructure needing replacement in the U.S, communities require systems that are resilient and enduring.

We have expanded our portfolio of services by thoughtfully curating some of the most established and proven technologies in water, wastewater, and stormwater pipelines.

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