

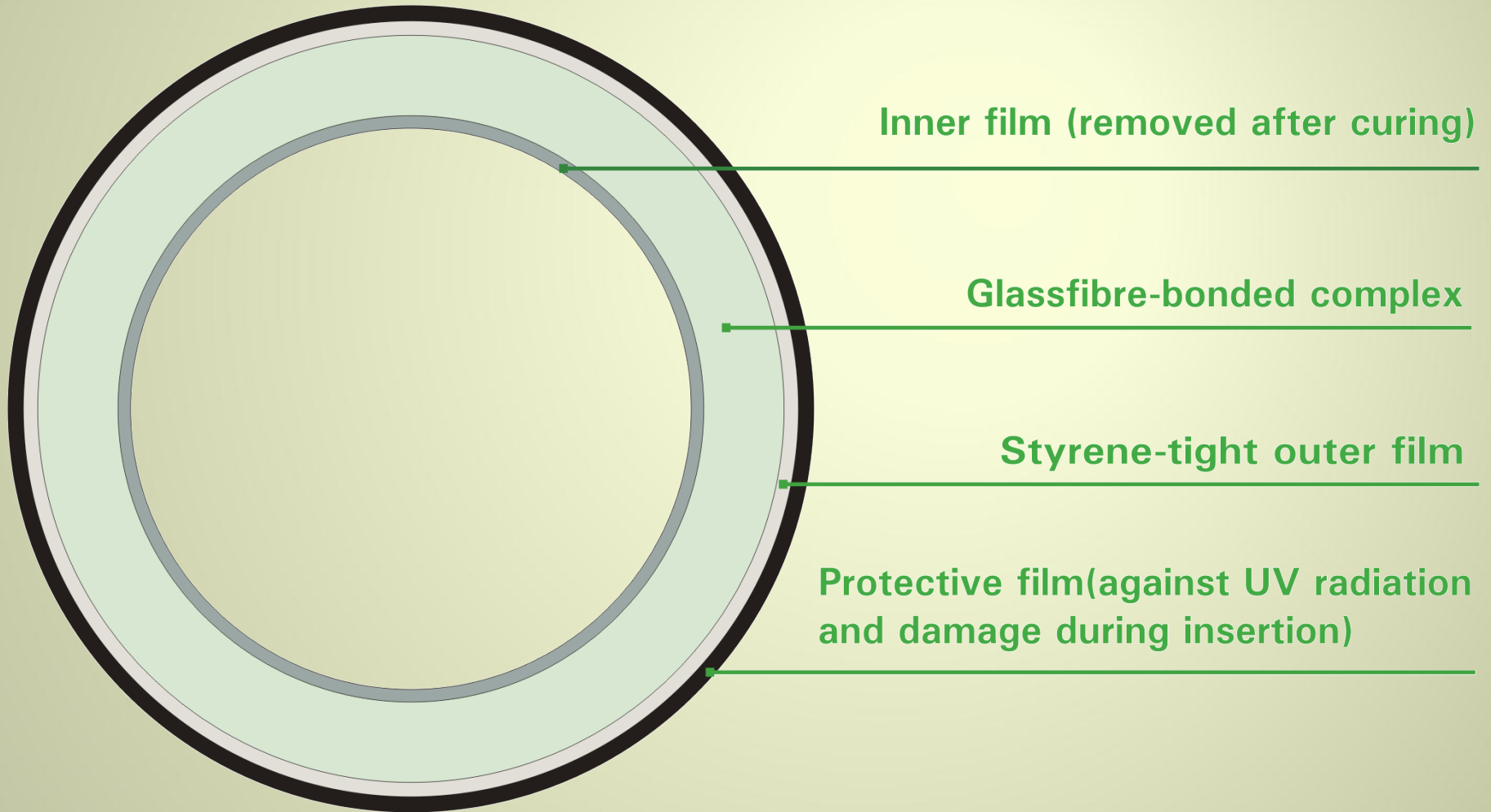
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Advancements in UV Technology for Curing Glass Fiber CIPP Liners

Liner Construction



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MANUFACTURING
ISO 9001 CERTIFIED

Glass Fiber Liners Begin as a Single Strand of ECR Glass Fiber



Glass Fiber Mats Manufactured into Tubes



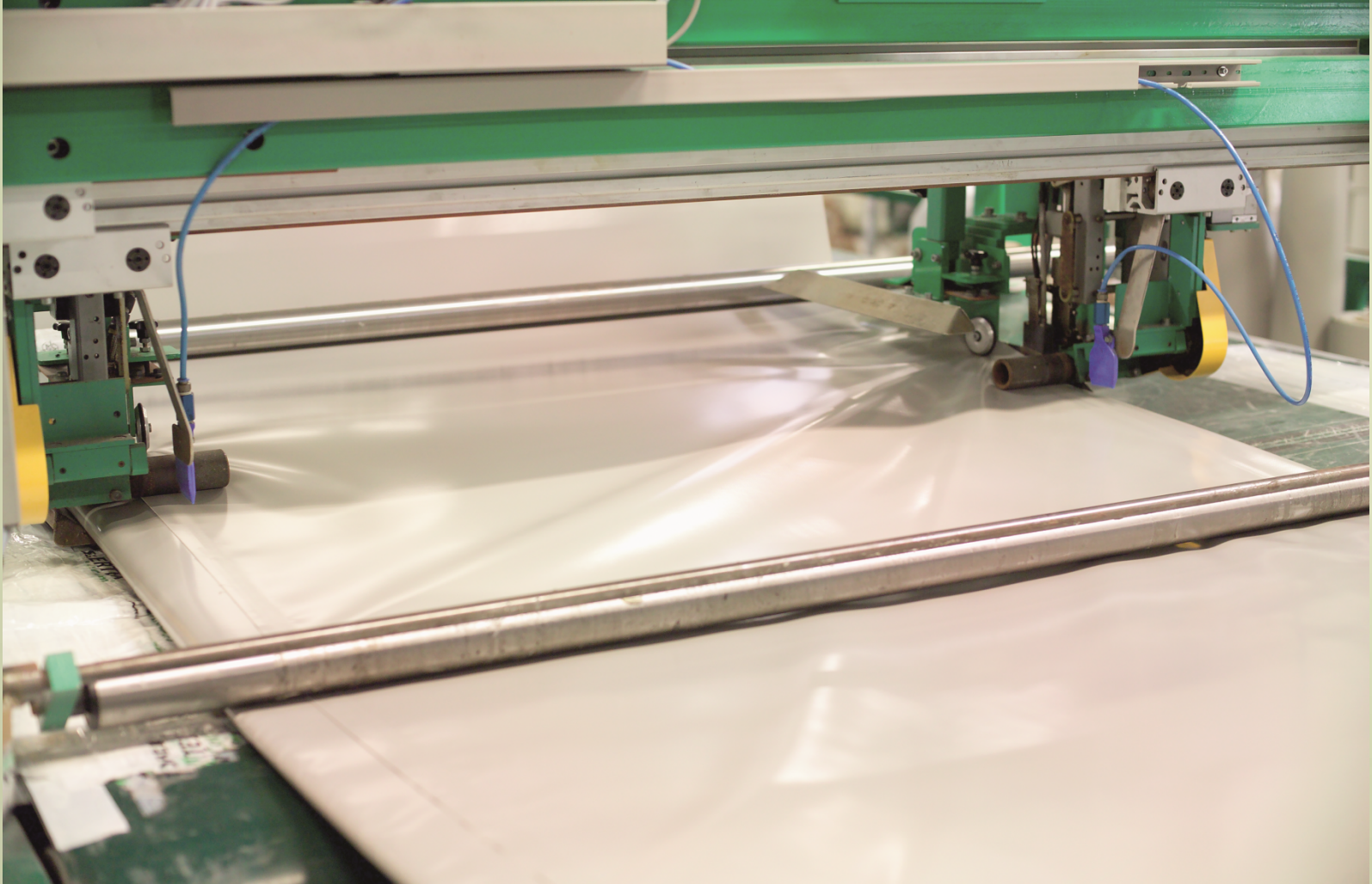
Wet Out Process



Applying the Outer Foil



Applying Protective UV Foil



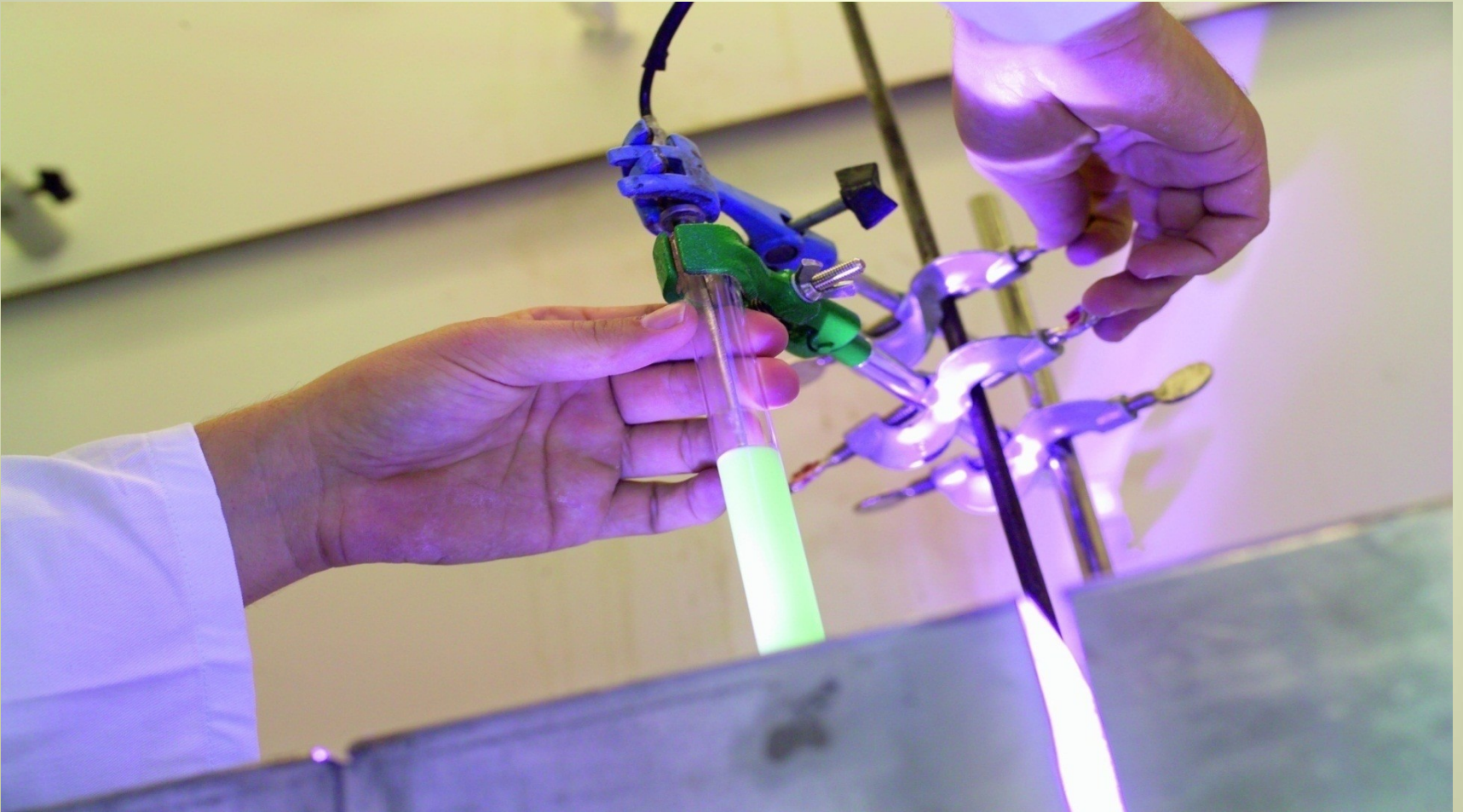
Completion and Packaging



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Quality Control

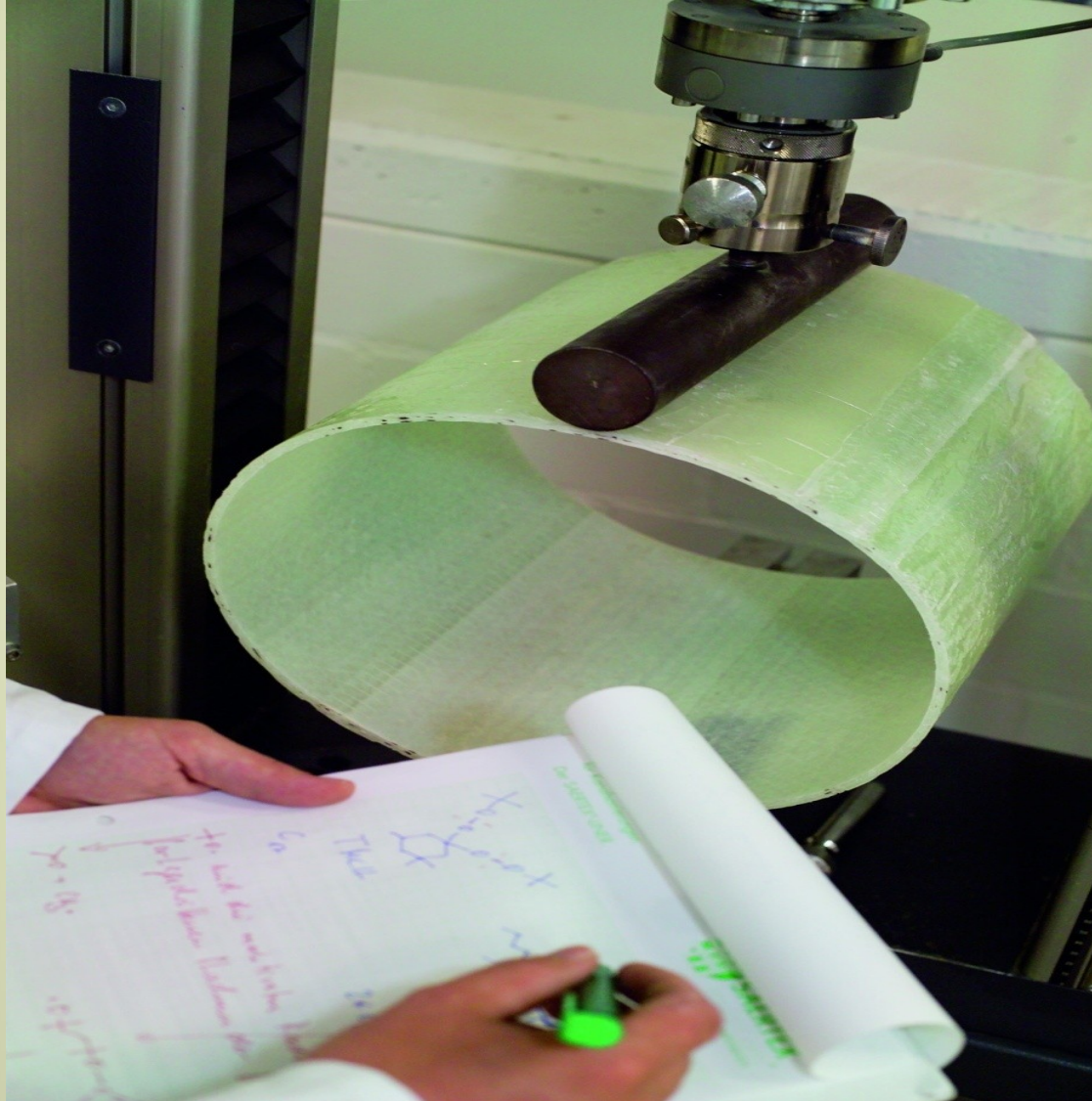
Resin Testing



Curing Test Samples



Flexural & Tensile Testing



Precision Trenchless LLC

INSTALLATION

Installation Benefits

- ❖ The ability to inspect the inside of the liner before curing and during curing
- ❖ Higher strength than felt or fold & form liners
- ❖ 70 year life expectancy
- ❖ Shorter cure times
- ❖ No resin slugging at laterals
- ❖ Uniform wall thickness

Installation Benefits

- ❖ Not weather dependent, can line anytime of the **year**
- ❖ Can line any shape or size up to 60"



7 different layers to UV cured fiberglass CIPP



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Outer protective UV removal-
curing begins within minutes



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Fully deteriorated culvert



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Pre-jetting Lines and CCTV



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Marking the Lateral's



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Install Gliding Foil



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Pull in Liner



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Liner is winched into place



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Preparing to insert light train and outer sleeve



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Insertion of UV Light source



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12" line and protective outer sleeve install



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24" installation



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Ready for air



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Liner pulled through middle MH



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Packer Install



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Curing of CIPP



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Before. During. And After.



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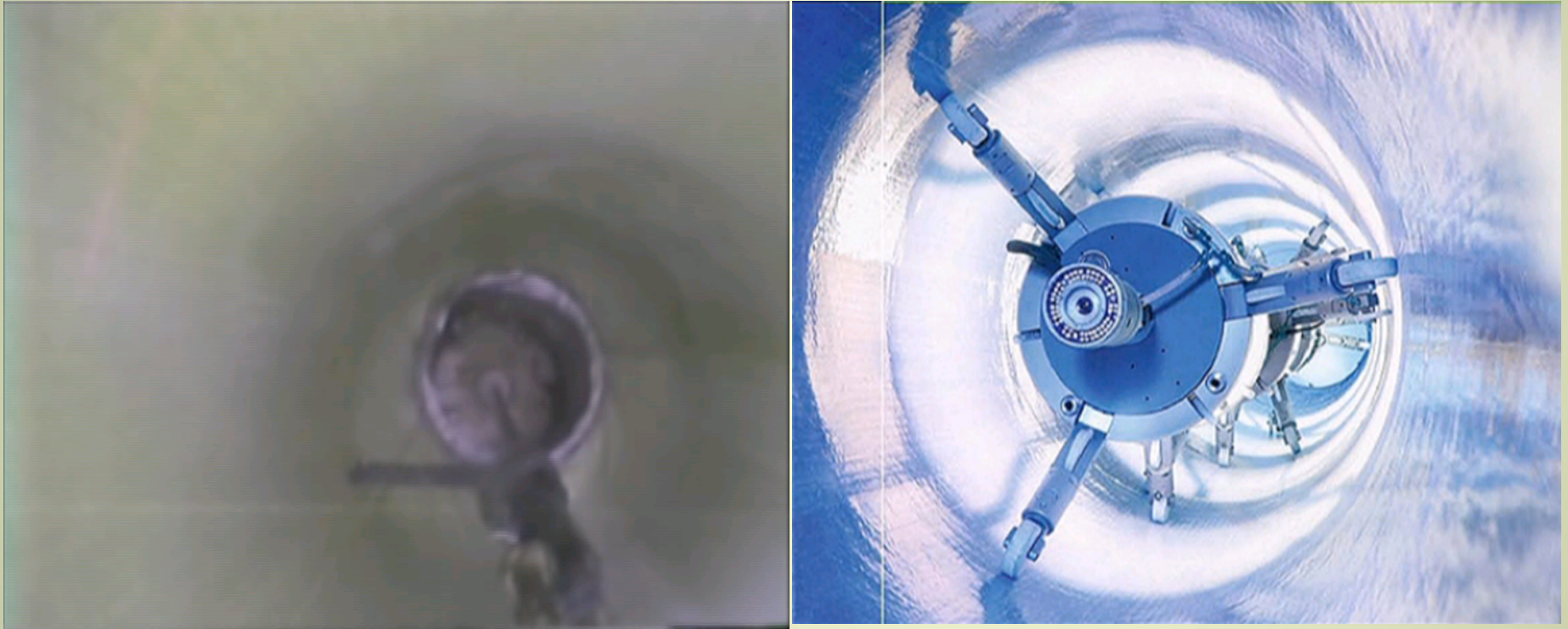
Camera once train is inserted and control panel for curing



Control & Recording



Document the curing process



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Little disruption to traffic flow



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View one manhole to the other



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24" 120 LF Pre-Install



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Finished Liner



Finished Liner



Before

After





Up to 60 inch

Challenging Locations



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Environmental Benefits

- ❖ No detect of any styrene leaching from cured liner at 1 PPM threshold
- ❖ No resin washout or slugging
- ❖ No discharge of Styrene laden water an 8" line with a 400 LF Run will need about 1,100G of water, a 48" line will need over 37,000 G!
- ❖ No resin discharged downstream or into wetlands
- ❖ Up to 90% less fuel consumed
- ❖ Smaller carbon foot print
- ❖ Environmentally friendly

End User Benefits

- ❖ Thinner wall profile no more than 12mm
- ❖ Return to service within an hour of cure completed.
- ❖ Uniform wall thickness
- ❖ Higher strength than Felt liners and Fold & Form – 1.7M PSI vs 350,000 PSI for Felt
- ❖ Longer life = Longer Asset Depreciation
- ❖ Less disruption to the public

D. A. Van Dam & Associates, LLC

MANUFACTURERS REPRESENTATIVES

REPRESENTING PRODUCTS WITH PROVEN TECHNOLOGY & PROVEN RESULTS SINCE 1970

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Precision Ultra Violet (CIPP) Cured In Place Pipelining System

BENEFITS

- ✓ The installation with UV-Systems in combination with high performance UV resins results in extremely short curing times – up to 6 feet per minute
- ✓ Is not affected by water table issues
- ✓ Nearly all the equipment for installing and curing the liner is contained on one truck resulting in a small jobsite footprint – less disruption to the public
- ✓ Liner sizes 6" to 60" diameter
- ✓ ISO 9001 manufactured products assuring quality on every job
- ✓ 90% Less Fuel Consumed – smaller carbon footprint

Further Advantages of UV Cured Liner:

- Enormous economic & ecological advantages as well as high environmental compatibility compared to conventional open design
- Curing by steam or UV light, thus permitting an eco-friendly, fast & flexible procedure compared to hot water curing
- Use of a high performance resin that allows extremely fast curing speeds compared to comparable systems with UV curing
- Short delivery times-Quick response to customer needs
- Systems for municipal sewage and industrial waste water
- NO DIG system, no or little service interruption
- Proof of durability service of at least 70 years
- Cost/Value advantages in larger diameters
- Established manufacturer over 20 years
- Fits/Conforms to all shapes of pipes (oval, square)
- No resin washout-no discharge downstream – no styrene odors

At a Glance:

Material Properties as per ASTM Standards

	Precision Liner	Traditional Felt Liners
Flexural Modulus	1,015,264 psi - 1,740,453 psi	250,000 psi - 400,000 psi
Flexural Strength	29,008 psi - 36,259 psi	4,500 psi - 5,000 psi
Product Life	70 Years (Longer Life)	Up to 50 Years

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