

SECTIONAL LINER REPAIRS

Installation Specifications

Intent: State requirements for design, materials equipment and labor deemed necessary to install sectional laminates in lined and unlined pipes using the cured in place fiberglass sectional liner insert.

Reference Specifications: This specification references the American Society for Testing of Materials (ASTM) standards which are made part hereof by reference and shall be the latest edition and revision.

D543 Testing Method of Plastics to Chemical reagents

D578 Standard Specifications for Glass Fiber Strands

D1600 Abbreviations of Terms Relating to Plastics

Reference is further made to NASSCO Standard: Recommended Specifications for Sewer Collection Systems Rehabilitations.

General Corrosion Requirements: The cured sectional liner insert shall consist of materials chemically resistant to domestic sewage. Fiberglass materials shall be corrosion resistant E-glass (ECR-glass). The fiberglass material shall be factory impregnated with Polyester, Vinyl Ester or Epoxy resins that are UV Light reactive. When the laminate is mounted on the applicator; epoxy or other adhesive products shall be used to secure a permanent bond between the laminate and host pipe.

Line preparation: To achieve a successful Sectional Liner seal the following steps shall be adhered to:

Prior to the installation of the sectional laminate, the area in and around the repair area shall be checked of sharp objects that could damage the bladder. Where such debris is found, initial cleaning of the area by high pressure hydraulic cleaning or mechanical cleaning is required.

Sectional Liner Construction: The laminate shall be constructed with sufficient flexibility, ensuring complete conformity to the main pipe. The laminates shall be 100% saturated with resin and have sufficient thickness to ensure a watertight seal.

Sectional Liner Dimensions: The laminate shall be fabricated to fit the specific size of the host pipe.

Installation: Sheltered in and interior space, protected from UV-light radiation, the laminate shall be removed from its packing and placed on the prepared applicator. The edges of the laminate shall next be coated with an additional suitable bonding agent to ensure a seal between the laminate and the liner and the lateral pipe. Then, the loaded

applicator shall be transport to the area needing repairing. The applicator shall be inflated with sufficient air pressure to allow the packer to push the laminate against the pipe walls with sufficient pressure to seal off water infiltration. When this is achieved, the UV-light curing system shall be activated from the time prescribed by the manufacture to complete a successful cure. Following the curing cycle, the applicator shall be deflated and brought back to the entrance point to begin the next laminate installation.

Bypassing: If bypassing is needed the contractor shall be responsible.

Deviations: The contractor shall inform the owner, about repair areas that are unable to have the sectional repairs performed.

Final Acceptance: Upon completion, the installer shall deliver a VCR (video tape), CD or DVD showing the installed sectional liners to the owner. The camera used shall have a lens system capable of viewing both edges of the sectional laminate ensuring a full inspection of the laminate seal and laminate edges.



Characteristics of the Top Hat™ Sectional Liner Laminates

- Manufacture:** Cosmic Sondermaschinenbau
Steinabruck 35
3072 Kasten Austria (43 27 44 70 04)
- Material:** ECR (E-glass Corrosion Resistant) fiberglass mat impregnated with an UV-light reactive Polyester resin. Bonded to the existing liner surface or existing pipe with an epoxy bonding agent.
- Wall Thickness:** 2.0 – 3.5 mm
- Flexural Modulus of Elasticity (psi) ASTM D 790**
800,000 (min)
- Strength @ Break (psi) ASTM D 630**
35,000 (min)
- Laminate length:** 8” pipes: @16 inches
10” to 20” pipes: @19 inches
Overlapping can create longer repairs if needed
- Installation:** Impregnated laminate is wrapped around a self-propelled packer and held in place with rubber bands. Epoxy sealant is added to both laminate ends. The loaded packer is driven into position. Exact position is achieved by watching a built in camera. The bladder is inflated to manufactures recommended pressure. Built in UV light source is activated and cures the Polyester resin in 7 minutes. The packer is deflated and returned to the entry point.
- Testing:** The method is part of the Top Hat™ lateral seal system. It was developed in Europe in 1995 and has been in extensive use. Bonding strength to an existing surface wetted with an oil emulsion and laminate strength has been tested by: Ingenieurburo fur Kunststofftechnik, Rolf Siebert Schulstrasse 22.22113 Oststeinbek/Hamburg Germany. Separations strength from wetted surface: Better than 275 psi (1.9 N/mm²). Modulus of Elasticity: Better than 1,100,000 psi (7,750 N/mm²)