



PERFORMANCE LINER® SECTIONAL FAQ

What is Performance Liner® Sectional?

LMK's Performance Liner® Sectional system is a unique one-step air-inversion point repair. This unique process prevents resin contamination and prevents resin loss which is the "KEY" component of a cured-in-place pipe. In fact, the resin that provides a structural seal only contacts the pipe only at the point of repair, ensuring the best possible cured-in-place pipe repair.



What pipe sizes can be renewed using the Performance Liner® Sectional?

This system renews mainlines from 6 to 42-inches. Smaller diameter (8-12- inch) sewer pipes can range in length from 3-50 –feet. Larger diameters can range from 3-30 –feet.

How is Performance Liner® installed?

First, the pipe is cleaned removing all debris and tree roots. The liner tube is inserted within LMK's patented translucent bladder and the liner is frangibly attached to the inversion bladder. This combination forms LMK's liner/bladder assembly.

A pre-measured amount of resin and catalyst is provided for the liner depending on diameter, length, and thickness. The resin and catalyst are mixed and introduced into a liner/bladder assembly under vacuum. The translucent bladder allows the installer and the inspector to visually verify the liner is fully saturated with the approved thermo-set resin ensuring there are no dry spots.



Then, the resin saturated liner/bladder assembly is inserted into a flexible launching hose that transports the liner to the point of repair. Once positioned, air pressure is applied causing the liner/bladder assembly to invert simultaneously through the section of damaged pipe. Continual CCTV documentation is performed as the liner is inverted and formed to the host pipe ensuring proper placement prior to curing the resin. Once the liner is cured, the bladder is peeled back from the liner like a banana peel and drawn into the launching hose. The launcher and bladder are removed from the pipe leaving a new cured in-place pipe.



How long does it take to cure?

Typically the resin is cured within 2-hours at ambient temperatures, or as fast as 30-minutes using LMK's steam curing system.

How do you cut the end of the liner open?

There is no cutting required since the liner is open-ended. This is accomplished by inverting the liner/bladder simultaneously. The bladder is longer than the liner so that when the liner is fully inverted, the bladder continues inverting so as to extend at least another 12 inches beyond the end of the liner allowing the liner to cure open-ended.



Will the liner reduce pipe size?

The liner thickness is determined by pipe condition, diameter, depth, soil modulus, and flexural properties of the liner. Liner thickness can range from 4.5mm to 30mm depending on design calculations. Regardless of liner thickness, LMK's Performance Liner® is engineered by design to incorporate tapered transitions at each end of the liner providing a smooth transition from the liner to the host pipe.

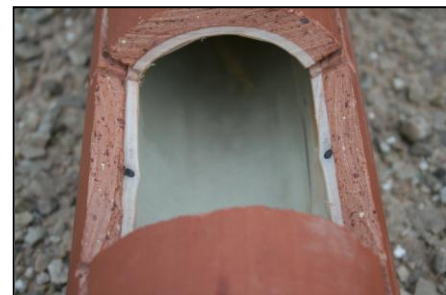


How do you verify the liner is bonded to the old pipe?

Sometimes liners stick and sometimes they do not. How do you verify the bond between a liner and the host pipe? No one can determine how well the liner is stuck to the pipe. Due to F.O.G. (Fats, Oils, and Grease) in a sewer pipe which has a negative effect on adhesion. Some sewer pipes are even made of polyethylene, a material well known to resist any adhesion. Since the Performance Liner® is a tubular liner inverted in-place, full resin contact is achieved allowing resin to migrate into pipe defects and pipe joints, mechanically anchoring the liner permanently in-place.

How do you verify the liner won't leak?

Since adhesion cannot be verified, the Performance Liner® Sectional system incorporates two hydrophilic swelling O-rings (1 on the upstream and 1 on the downstream ends) that are embedded between the old pipe and the new liner forming a uniquely designed compression gasket seal that is compatible with all pipe types.



How long will the liner last?

The Performance Liner® Sectional system has a minimum engineered service life of 50 –years, based on extrapolating test data of the liner's physical properties as described in ASTM F1216.



Is the Performance Liner® Sectional system resistant to corrosive chemicals?

A variety of thermo-set resin systems are available based on chemical content and temperature of the effluent. LMK has an engineering staff that will design the liner specifically for your project. Performance Liner® Sectional has been tested and complies with ASTM D5813, D790, D2990, F1216-06, and F2561-09.

Are liners custom made?

LMK offers custom made *kits* for the installer that appreciates convenience. LMK's Performance Liner® Sectional system is also available in *bulk* rolls of liner and bladder for the installer that needs the flexibility to assemble liner kits to a specific size for immediate use on pipeline repairs.



How does the Performance Liner® compare to a packer-wrapper spot repair?

Packer-wrapper spot repairs consist of spreading resin onto flat sheet liners, and wrapping the resin-soaked flat sheet around a sewer plug. This process does not incorporate vacuum impregnation as customarily taught and practiced in the cured in-place pipe industry. The resin-soaked flat sheet is held in place by rubber bands, Velcro, zip ties, or other means of attachment. The resin-soaked flat sheet is uncontained and exposed to workers and the environment during resin saturation. The resin-soaked flat sheet and plug are inserted into the pipeline and towed to the point of repair. Since the resin is exposed, the resin is wiped off as the liner is pulled to the point of repair. Every offset joint scrapes the resin from the liner. The Performance Liner® is a much different process and offers a superior method of installation. The Performance Liner® is vacuum-impregnated, meaning it is clean and safe for workers and the environment. No resin is wiped off as the resin saturated liner tube is towed to the point of repair; yet full resin migration is achieved at the point of repair as described in ASTM in F2599-06.





Is the Performance Liner® truly a structural liner?

Yes, the Performance Liner® is available as a standard cured in-place pipe (felt/ thermo-set resin) and is also available as an engineered glass reinforced cured in-place pipe utilizing LMK's ISG™ Liner (Inverted Structural Glass Liner).

Can large diameter liners be inserted through a standard manhole casting?

Yes, since the Performance Liner® is not wrapped around a sewer plug, but is a tubular liner/bladder assembly, repairs up to 48-inches in diameter can be folded and installed through a standard 22 -inch diameter casting.

