



CSI: DIVISION: 22 00 00—PLUMBING  
Section: 22 13 16—Sanitary Waste and Vent Piping

**Product certification system:**

The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

**Product:** MaxLiner® Cured-in-Place Pipe (CIPP) System

**Listee:** MaxLiner LLC  
450 College Drive  
Martinsville, Virginia 24112  
[www.maxlinerusa.com](http://www.maxlinerusa.com)

**Compliance with the following codes:**

2024, 2021, 2018, 2015, 2012 and 2009 *International Plumbing Code*® (IPC)  
2024, 2021, 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)  
2024, 2021, 2018, 2015, 2012 and 2009 *Uniform Plumbing Code*® (UPC)\*  
2022 *Uniform Illustrated Plumbing Code – India*™ (UIPC-I)\*

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**Compliance with the following standards:**

ASTM F1216-2024, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of Resin-Impregnated Tube, ASTM International.

NSF/ANSI 14-2023, Plastic Piping System Components and Related Materials, National Sanitation Foundation.

ICC-ES LC1011 (October 2010), PMG Listing Criteria for the Rehabilitation of Existing Building Drains and Building Sewers by the Inversion and Curing of Resin-impregnated Tube.

**Identification:**

At a maximum distance of 20 feet (6096 mm), aboveground, along the resin-impregnated lined pipe or tube and at each fixture connection, a label is attached indicating the listing holder's name (MaxLiner LLC), the words "Attention, resin impregnated tube liner", and ICC-ES PMG listing mark. The label must include a warning against using flame or heat when repairing any part of the piping system. (See Figure 1)

**MaxPox Resin:** Each container bears a label with the product name, the manufacturer's name (MaxLiner LLC), NSF listing mark and the ICC-ES PMG listing mark.

**MaxPox Hardener:** Each container bears a label with the product name, the manufacturer's name (MaxLiner LLC), NSF listing mark and the ICC-ES PMG listing mark.

MaxLiner tubes: Each container or package bears a label with the product name, the manufacturer's name (MaxLiner LLC), NSF listing mark and the ICC-ES PMG listing mark.

#### Installation:

Installation must comply with the manufacturer's published installation instructions and the applicable codes.

The MaxLiner® Cured-in-place pipe (CIPP) System must be applied by installers trained and certified by MaxLiner LLC.

**Inspection and Cleaning:** The pipe must be clean of all debris, roots and other obstructions that would block proper inversion of the CIPP. The cleaning must be done with a high-velocity jetter or with mechanically powered cleaning equipment.

Inspection of the pipe must be done using a closed-circuit television (CCTV) camera and performed by experienced personnel trained in locating breaks, obstacles and service connections. The interior of the pipe must be carefully inspected to determine the location of any conditions that may prevent proper installation of the CIPP liner into the pipe, conditions such as protruding service taps, collapsed or crushed pipe, reductions in the cross-sectional area of more than 40%, or other obstructions must be corrected.

If inspection reveals a condition that cannot be removed by conventional sewer cleaning equipment, then a point repair excavation should be made to uncover and remove or repair the obstruction.

**Preparation, Installation and Curing of the Liner:** The quantity of the specified MaxPox Resin and MaxPox Hardener required must be calculated in accordance with the manufacturer's formula based on pipe diameter, length and liner thickness. The quantity should be adjusted by adding 5% to 10% more than calculated to allow for migration into the cracks and joints of the original pipe.

The MaxPox Resin and MaxPox Hardener must be mixed in accordance with manufacturer's recommendations.

The installer must remove all air from the liner tube using vacuum equipment approved by the manufacturer prior to filling the liner with the blended epoxy resin.

Once the liner tube has been "wetted out" with the blended epoxy resin, the installer must evenly distribute the blended epoxy resin in the liner tube using a calibration roller approved by the manufacturer to insure thorough saturation.

The "wetted out" liner tube must be inverted into the pipe, cured and inspected in accordance with the manufacturer's published installation instructions using equipment approved by the manufacturer. The epoxy must be cured using one of the following methods:

**Circulation of hot water, or air, or steam:** A bladder, referred to as a calibration tube, is installed inside and beyond the length of the liner. The bladder is filled with water, hot air or steam pressurized to manufacturer's recommendation. The bladder is connected to a heater which circulates the water, air or steam in the bladder and raises the temperature to between 120°F and 160°F. This temperature and pressure are maintained for a minimum of one hour. This forces the liner against the inside diameter of the piping during curing. The liner must be properly cooled down in accordance with manufacturer's recommendations before the bladder can be removed.

**Ambient air curing:** Depending on the air and ground temperatures, the appropriate mixture of MaxPox hardener is mixed with MaxPox Resin to "wet out" the liner, which is inverted into the pipe. There are different formulations of MaxPox hardener, depending on the temperature (hot weather, warm weather and cold weather mixtures). Once the liner is installed in the pipe, the epoxy can be cured by exposing the liner to ambient air.

#### Models:

**MaxLiner® Cured-in-place pipe (CIPP) System:** The system consists of components tested and listed to NSF 14 and ASTM F1216. The system consists of the MaxLiner tubes, MaxPox Resin and MaxPox Hardener.

## Conditions of Listing:

1. Installation must be performed by installers trained and certified by MaxLiner LLC.
2. The MaxLiner® CIPP System may be used to line pipe with minimum diameter of 2 inches (50 mm) to maximum diameter of 10 inches (254 mm).
3. The minimum wall thickness of the liner must meet minimum design calculations per ASTM F1216 Non-Mandatory Appendix X.1 (if applicable).
4. The pipe must be inspected and cleaned in accordance with the Inspection and Cleaning section of this listing and the manufacturer's published installation instructions.
5. Samples of the MaxLiner® CIPP System taken in accordance with ASTM F1216 Sections 8.1.1, 8.1.2 and 8.1.3 must be tested in accordance with ASTM D 790 for short-term flexural strength and flexural modulus. The minimum flexural strength must be 4500 psi (31 MPa) or greater and minimum flexural modulus must be 250,000 psi (1724 MPa) or greater. The testing must be conducted by an accredited laboratory acceptable to ICC Evaluation Services.
6. Final video inspection in accordance with ASTM F1216 must be performed and witnessed by the code official or his designated representative. The final inspection must verify that the liner is continuous over the entire length of the inversion and is free of dry spots, lifts, and delamination.
7. Leakage verification testing must be performed and witnessed by a representative of an accredited laboratory. A test assembly must be set up utilizing a 4-inch-diameter (102 mm) pipe that is a minimum of 50 feet (15.24 m) in length with fittings used to simulate an actual installation. The test assembly must be lined and cured in accordance with the manufacturer's installation instructions. The completed test assembly must be tested for leakage in accordance with ASTM F1216 Section 8.2. Maximum leakage with the maximum pressure of 4.3 pounds per square inch (psi) (29.7 kPa) at the lowest point should be 50 gallons per inch of pipe diameter per mile per day with all air bled from the system.
8. MaxLiner® CIPP System materials are under a quality control program with annual inspection by ICC-ES.



FIGURE 1—CAUTION LABEL