RS MaxLiner®

Cured-in-place pipe (CIPP) system for the rehabilitation of house connections and laterals

Fields of Application	Sewer gravity systems and drain lines
Diameter	2” to 12” (50mm to 300mm)
Resin	Epoxy resin system MaxPox® Resin with MaxPox 20 / 30 / 60 Based on bisphenol A/F, amine curing, solvent-free, filler-free
Liner	MaxLiner PU-coated polyester needled-felt liner
Impregnation	On-site impregnation under vacuum
Curing	Cold, hot water or steam

1. Description

The RS MaxLiner system is a technique (pipe-in-pipe relining) for the trenchless rehabilitation of house service connections and laterals. A flexible liner is impregnated with the two-component epoxy resin system and, depending on the arrangement of the pipes, installed through the shaft, inspection opening, access holes or roof runoffs. A new pipe is formed as the liner is cured within the host pipe.

The RS MaxLiner system combines two installation options:

- the inversion of the impregnated liner by means of compressed air (inversion device RS LinerGun®) and
- the inversion of the impregnated liner by means of hydrostatic water column

The resin system is cured by circulation of hot water or steam in the installed liner or in particular applications under ambient temperatures.

There are three different resin systems with varying working and curing times used. MaxPox 20 for working times of approximately 20 min at 23°C, MaxPox 30 for approximately 30 min and MaxPox 60 for a working time of approximately 60 min at 23°C.

The ratioing and mixing of the resin components and the impregnation under vacuum take place on-site by using the RS CCM®, a computer controlled mixing unit.

The RS MaxLiner® system may be designed to assume all functions of the previous pipe. The pipe-in-pipe solution is solely sustainable and may bear all structural external loads without the support of the previous pipe. The hydraulic efficiency of the sewer is generally improved based upon the smooth surface of the installed liner.

Figure 1: Sewer before and after rehabilitation

2. Fields of application

- RS MaxLiner may be used for all pipe materials
- Any house and underground pipes from the house or clean-out to the sewage system
- Drop pipes from the roof to the basemenet
- Drainage pipes for garages, gardens and courtyards
- Lengths of up to 300 ft (100m) with bends of up to 90° and siphons are possible
- Selective rehabilitation of bushings and holes
- Installation through existing shafts and openings
- Industrial sewers under consideration of the medium transported.

3. Technical data

For the detailed structure and mechanical parameters, please refer to our product datasheets.

- The liner is soft and flexible before curing and the elasticity allows for diameter changes of up to 35% depending on the liner material used
- The wall thickness is between 3 and 6 mm
- Operating temperatures up to 40 degrees C are acceptable with the standard resin and coating system. Higher temperatures are considered on a case-by-case basis.

4. Installation

The host pipe must be cleaned prior to the installation of the liner, generally using high pressure water. The cleaning is important to remove loose particles and obstructions. Protruding obstructions, such as improperly installed taps or root penetrations, must be removed flush with the pipe surface.

The liner is impregnated on-site using the two-component epoxy resin system MaxPox Resin and MaxPox 20, 30 or 60. This involves the use of the automated mixing unit in which the resin components are mixed by a static mixer to achieve a homogeneous and air-free result. Prior to impregnation, the liner is set under a vacuum to remove air remaining in the felt. The homogeneous distribution of the resin system in the needled felt material controlled by calibration (calibration roller distance and speed, Figure 2).

The impregnated liner is inverted in the sewer by means of the RS LinerGun (Figure 3).

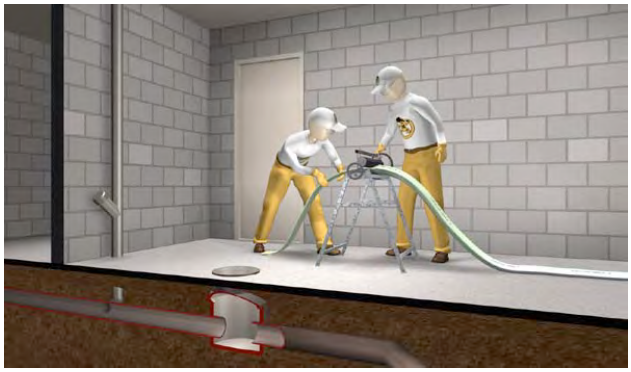

Figure 2: Liner calibration using calibration roller

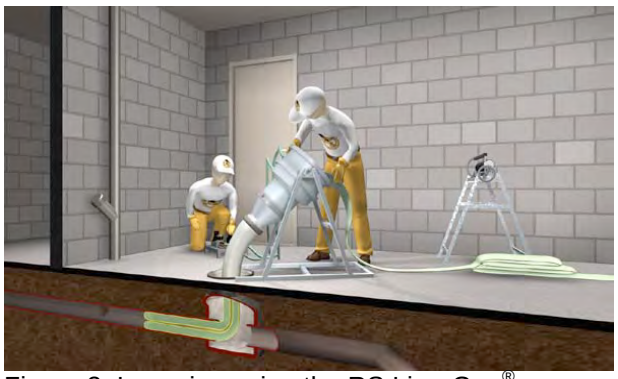

Figure 3: Inversion using the RS LinerGun®

The resin system may be cured by using hot water or hot steam circulation in the installed liner.

5. Connection techniques

After completed curing and cooling, the liner is to be opened in the shaft areas and lateral pipes. Inlets sealed by the liner may be opened using a robotic cutter.

6. Classification

- All resin components comply with REACH. REACH means the **R**egistration, **E**valuation, **A**uthorisation and Restriction of **Ch**emicals (Regulation (EC) No. 1907/2006).
- The system is generally approved by building authorities: DIBt approval no. Z-42.3-454
- RAL quality mark S29.10

7. Features

- Highly flexible application by mobile impregnation with MaxPox epoxy resin
- Optimum compatibility to hardener and liner materials
- Extensive measuring and documentation technology with RS CCM®
- Various installation and curing options
- Very good adhesion
- Very good chemical resistance

- Styrene-free
- Reliable and long-term structural strength
- Tool kit and safety at work items
- The RS MaxLiner® equipment is mounted on a completely equipped vehicle

RS Technik offers its customers a comprehensive training and education program that is related to both theory and practice.

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