

Sanikom Relining Systems

- Preparation
- Installation
- Curing
- **Movie for Liner impregnation and installation**
CIPP Lining Installation Training from Sanikom
<https://www.youtube.com/watch?v=WjO-BGChWDw>
- **SANIKOM Lining Method Statement 08.2020 EN**

Liner Installation

- **Construction site preparation**
 - Clean the host pipe section sufficiently to ensure any existing damage can be clearly seen on the monitor screen.
 - Measure the pipe diameter in the pipe at all accessible places (please note, it could be a pipe socket at the beginning of the pipe).
 - CCTV inspection (no deposits, no protruding shards, possible dimensional changes, infiltration of groundwater, sacking).
 - Mark in writing any lateral connections to be reopened after the lining job.
 - Measure the length of the pipe to be rehabilitated (measure on the camera cable, do not trust the display on the monitor).
 - accessibility to the pipe, in order to be able to position the inversion drum accordingly
 - Measure the distance from the drum to the beginning of the pipe

Use the prepared forms from the operating manual

- **With the information obtained beforehand, you select the liner and the way of installation**

- **Selection of resin**
 - Air temperature
 - Pipe temperature
 - Resin temperature
 - Length of the pipe
 - Bends
 - Impregnation of the liner in shadow or air-condition place
 - The drum is positioned in a shady place.

Temperature and solar radiation have a major influence on the processing time (potlife) of the resin

Calculate the time you need for impregnation and installation of the Liner

- **Please note**
the processing time of the resins was determined at a temperature of 22° C.
- + 10° C (32° C) means a 50% reduction in processing time (potlife)
- 10° C (12° C) means an extension of the processing time (potlife) by 50%
- **With the information obtained beforehand, you select the Resin**

Resin quantity calculation

For example: Liner DN150, 3mm, 10m with EX2-2 resin

$$\text{Diameter DN [m]} \times \text{Liner tickness [mm]} \times 3,14 \times \text{factor 1} \times \text{Liner length [m]} = \text{Volume [Liter]}$$
$$0,15 \text{ m} \quad \times \quad 3 \text{ mm} \quad \times 3,14 \times 1 \quad \times \quad 10 \text{ m} \quad = \quad 14,13 \text{ L}$$

Resin EX2-2, **mixing ratio 100 : 25 in kg** (epoxy resin calculated always in kg)

Density of EX2-2 = 1,1 kg/L

Density x Liter = amount of resin in kg

$$1,1 \text{ kg/L} \times 14,13 \text{ L} = \underline{15,54 \text{ KG}}$$

- **Before you start to cut the Liner and do impregnation, prepare your equipment**
 - Drum in position
 - Correct inversion fitting
 - checking the length of the control rope in the drum (then wrap it evenly in the drum and wrap it tightly)
 - pull the rope through the drum to pull out the liner at the inversion fitting
 - Put the glycerin-filled manometer on the drum and calibrate it to zero
 - Connect the compressed air hoses to the drum and carry out a test run with the compressor

- **Following items should be available and in position where you need it**

-power supply (electricity)	-temperature measuring device	
-Compressor	-items on the picture	
-Water for Steam unit		
-Diesel (fuel for Steam unit and compressor)		
-Usual hand tools (knife, scissors, allen key)		
-Waste containers		
-Gloves		
-Mixer for resin		
-Funnel (to fill the resin into the liner)		
-cable ties (5 mm)		
-fabric tape		
-cleaning cloths		
-sliding oil (cooking oil)		
		

▪ Liner length calculation

Distance from fitting of the drum to the pipe

+

Pipe length

+

70cm to connect the control rope with the Liner

If there are bends in the pipe...

1x 90° bend add 1x pipe diameter

1x 45° bend add 1x ½ pipe diameter

Clothe the end of the liner with fabric tape and connect vacuum.

Vacuum should be 0,35 – 0,5 bar

Clothe the other end of the Liner with Z folding, but enough space to fill a view liter of resin into it

- **Resin mixing and impregnation of Liner**
 - Resin has to be mixed in the correct mixing ratio
 - Each can has to be mixed 3 minutes
 - Fill the mixed resin into the Liner... care about it, that no air is able to get into the liner.
 - Roller gap of impregnation table: 2x liner thickness + 2mm (vertical pipes just 2x Liner thickness)
 - Slow impregnation without any white spots
 - **the impregnated liner never be stored on top of each other, otherwise the resin may react quickly and uncontrollably. A trapped heat is created! Keep the impregnated liner cool!**

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- **Loading the drum with liner and inversion**
 - the liner must be spread tightly over the entire width of the drum.
 - the liner should be provided with plenty of lubricant.
 - the time window in which the liner is in the drum must be as short as possible, since trapped heat can also arise
 - the inversion of the liner starts by carefully increasing the air pressure in the drum.
 - the inversion of the liner can be supported and controlled by the handwheel.
 - refer to the technical data sheets for the maximum inversion and curing pressure

■ Curing

- The curing time starts after potlife (processing time)
- Depending on the temperature, it will be regulated
- the coldest area of the liner determines the curing time
- Please note! Side connections, which are filled with water, slow down the hardening process. More time is needed here
- **it doubles the curing time for liners that were built into a groundwater zone!**
- after curing is complete, the liner must be cooled down to 35 ° C ... hold this temperature for about 20 minutes