

## 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.

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**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

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

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

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

## Calculation of component A and B of EX2-2 Resin

Resin EX2-2, **mixing ratio 100 : 25 in kg**

Total resin amount : mixing ratio (100 + 25) = 125/1  
15,54 KG : 125 = **0,1243 kg**



125/1 x 100 = total amount of comp. A    **0,1243 kg x 100 = 12,43 kg of comp. A**

125/1 x 25 = total amount of comp. B    **0,1243 kg x 25 = 3,11 kg of comp. B**  
in total     15,54 kg

You also can use the Sanikom resin calculator (Excel file) or the tables in the manual and technical data sheet

- **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