

## Sewer Pipe Spot Repair using sikotec - 3P® Plus Shortliner Resin DIBt Z-42.3-326

### Process Overview

#### Product Information

The 3P-Plus Shortliner Process is a sewer spot repair method that allows for the “trenchless” (without need to excavate the sewer pipe) and remote repair of sewer/underground pipes. It restores leak-tightness in the short to medium term and provides continued stability of the sewer pipe.

The process is defined under DIN EN 752-5, the German standard for drain and sewer systems located outside of buildings. The 3P-Plus Shortliner resin comes with a 5-year warranty and has a minimum life span of ten years. It is approved by the German Institute of Civil Engineering (DIBt) until 2015.

#### Areas of Use

The 3P-Plus Shortliner Process is ideal for the repair of cracks (e.g. radial or longitudinal cracks, or a combination) and leaky pipe connections, irrespective of pipe material, provided that the existing pipe system is stable (e.g. longitudinal cracks with minimal pipe deformation and an intact lateral foundation; if required assess foundation through long-term observation and/or probing tests).

The process can be used for the restoration of the following types of sewer/underground pipes:

- concrete, armoured concrete
- vitrified clay
- fibre cement
- cast iron
- glass fibre reinforced plastic

with a circular cross-section of 100 to 700 mm in diameter; as well as for the repair of leaking PVC-U sewer pipe joints or inspection points.

The 3P-Plus Shortliner has a coverage range of 0.4 - 1.4 m in length (depending on the repair bladder used). With cracks longer than the stated coverage range, liners can be overlapped (2-3 layer construction must not fundamentally be altered). The certification by the German Institute of Civil Engineering (DIBt) is based on a standard length of approx. 50 cm.

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### Preparatory Work

The liner must only be applied to a repair site that has been cleaned, mechanically pretreated and is temporarily without flow. The damaged area must be measured accurately prior to performing the repair work, and placement of the repair bladder should be observed with a surveillance camera.

#### *Inspect, clean and pretreat repair site*

Perform an in-depth inspection of the damaged sewer pipe and its crosssection using a surveillance camera. Clean the sewer pipe and take measurements if necessary.

Remove any obstacles.

If strong infiltration is present, seal existing pipe with a suitable method prior to commencing repair work. While performing the repair work keep sewer pipe free of flow. Maintain the run-off capability of the sewer pipe and ensure waste water from side branches is diverted.

Clean and pretreat the inside wall of the pipe just before applying the liner. Remove any grease or other residue from the surface. Lightly sand pipes with a smooth surface, such as glazed vitrified clay pipes. Concrete pipes or pipes with a similar surface need to be milled.

### Surveillance Camera

Different types of surveillance cameras are available for the inspection and assessment of the repair site and the positioning of the repair bladder. Please contact us for details.

### Spot Repair Process

A resin-saturated fibreglass laminate is wrapped around an inflatable repair bladder. Sliding rods, pressurized sliding rods or a lifting jack can be used to position the repair bladder at the damaged area of the sewer pipe (using a surveillance camera if required). The repair bladder is inflated with air and the saturated fibreglass laminate is pressed against the inside wall of the sewer pipe, forcing the excess resin into the damaged area for a long-lasting seal. Structural load bearing capacity can be achieved with a multi-layer laminate.

After a two-hour curing period (at an ambient temperature of 20 °C) the repair bladder is removed from the sewer. The cured-in-place liner covers the damaged area seamlessly and doesn't restrict drainage. The repaired wall thickness is > 3 mm.

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### Repair Bladder

Repair bladders are used for the spot repair and maintenance of sewer and other underground pipes. They are ideal for the repair of fissures, leaky joints, misalignment, root in-growth or corroded pipe sections. Sewer lines of all types with a circular cross-section of 50 to 800 mm in diameter can be repaired or maintained by repair bladders. All bladders are made of a special rubber guaranteeing the necessary flexibility, strength and resistance. All metal parts are made of corrosion-resistant materials.

#### *Select correct bladder size according to size of pipe*

- Each repair bladder is designed for a specific diameter range. This diameter range is clearly marked on the bladder.
- Before using the bladder always measure the inside diameter of the pipe and check if the pipe diameter is within the range that is marked on the bladder.
- Never use a bladder in a pipe that has a larger or smaller diameter than the one marked on the bladder.

#### *Position wheels of repair bladder correctly*

Incorrect adjustment of the wheels can create difficulties during insertion into the pipe and cause a delay when positioning the bladder at the damaged section. Fast positioning of the bladder at the repair site is important for the proper curing of the resin-saturated fibreglass laminate; a delay could result in poor- quality repair work or even damage the bladder.

#### *Protect repair bladder from chemicals*

Prior to wrapping the resin-saturated laminate around the repair bladder, the bladder should be covered with PE-foil or a suitable protective coating to prevent a chemical reaction between the rubber of the bladder and the resin.

#### *Position repair bladder*

Sliding rods, pressurized sliding rods or a lifting jack can be used to position the repair bladder at the damaged area of the sewer pipe. These rods also serve to measure the exact distance between the inlet and the repair section as well as to inflate the bladder.

#### *Deflate the bladder before removing it from the pipe*

- Do not remove bladder before it is completely deflated.
- Never remove it by pulling the inflation hose! Always use the provided rope attached to eyebolt.