

EPOXONIC® EX 1355

Socket putty for sewer renovation

EPOXONIC® EX 1355 is a solvent-free 2-part epoxy resin-amine based levelling compound. It is slightly flexibilised and has a high internal toughness, which enables the material to compensate for minor mechanical stresses. It has been specially developed for underwater application.

Key-features:

Free of solvents and nonylphenol
Internal toughness, therefore suitable for pipe sockets
Good workability
Processable overhead
Adhesion even on wet concrete
Curing possible from +8 °C
Curing under water
Low leaching during the curing phase
Low shrinkage
Specially optimised for robot applications
Resistant to e.g. household waste water, oil and petrol
Hot water resistant
Adhesion on PVC
Filling work on cracks, individual joints and small holes can also be done by hand

Recommended applications:

EPOXONIC® EX 1355 is particularly suitable for the rehabilitation / repair of wastewater, combined and rainwater sewers in nominal widths DN 150 to DN 800 using robot technology. Filling work on cracks, individual sockets and small holes can also be carried out by hand. The sewers can be made of vitrified clay, clinker brick, concrete, fibre cement, reinforced concrete or PVC. The preferred area of application is repairs to components where slight movements are unavoidable, e.g. pipe sockets. The properties of the material allow work to be carried out vertically, horizontally and overhead. Bonding of various materials, e.g. concrete, stoneware, PVC and metal is possible. Thanks to the medium curing speed and long working time, it can also be used to repair larger break-outs.

Monitoring:

External monitoring of **EPOXONIC® EX 1355** is carried out by **cbm Centrum Baustoffe und Materialprüfung - Technische Universität München**.

Recommended additional equipment:

- Climate cabinet
- Mixer with integrated timer and slowly rotating spiral helix according to manufacturer's specifications.
- Temperature measuring device (IR technology, non-contact measurement).

Table 1: Properties of uncured EPOXONIC® EX 1355

Technical data	Part A	Part B	Mixture
Form	paste-like	paste-like	paste-like
Colour	greyish-white	yellow-brown	cream-coloured
Mixing ratio (parts by weight)	100	33	

Processing:

In general, the device-specific specifications (manuals) of the respective sewer robot manufacturer must be observed during processing.

Preliminary work: Wastewater control

Depending on the damage arrangement, the user may have to carry out waste water control. It must be ensured that the milled and cleaned bonding surfaces are not contaminated by contaminated waste water before the application of the resin compounds has been completed.

If groundwater is present, formwork must generally be used for the repair work. The renovation area must be kept free of waste water during the repair or renovation work.

Preparation of the surface

The substrate must be clean and free of loose particles, dirt, grease, oil, rust and dust. In the case of cementitious materials, the cement skin must be removed. Depending on the type of surface, cleaning can be carried out by sandblasting, brushing, sanding, etc.

Preliminary work

In preparation for repair work in the old sewer, the damaged areas must be milled over a large area using a suitable milling tool in accordance with the specifications of the respective equipment manufacturer. If necessary, an existing liner in the old sewer must be milled open around the opening of the connecting sewer and the liner edge must be back-milled for optimised anchoring of the resin (e.g. in the presence of groundwater). The inlet area must then be cleaned with a suitable water jet technique to remove the grinding dust.

Mixing process

Part B is emptied completely from the bag into the can with part A and mixed thoroughly with a suitable mixing device until the mixture appears uniformly cream-coloured and streak-free. We recommend using a mixer with a helical, spiral-shaped kneading tool and a low speed of approx. 100 - 200 rpm.

When mixing, particular care should be taken to ensure that no unmixed material remains on the base and walls of the can and that no air is stirred in.

The mixing process should take at least 4 minutes and be completed within 10 minutes. The energy input during mixing increases the resin temperature. This temperature must be measured and documented after the mixing process.

Using Table 2, the expected pot life and demoulding time can be determined.

At temperatures above 25 °C, the working time is considerably reduced.

Working time resp. pot life

The resin compound can generally be applied between +8 °C and +25 °C. If possible, the temperature of the substrate should not be below 8 °C. Curing is possible from 5 °C, but curing must be expected to be severely delayed.

When applying to a wet surface, the material should be pressed on for ≥ 10 seconds before further pressing / levelling. This supports adhesion to wet surfaces.

Injection

EPOXONIC® EX 1355 can be processed using suitable shuttering technology (e.g. shuttering sleeve and bladder). The grouting pressure should be adapted to the robot and material. After the resin has hardened, the bubble and the formwork collar must be removed and the repaired area reworked if necessary.

EPOXONIC® EX 1355 can also be used to fill cracks, individual joints and small holes by hand.

Cleaning the devices

Uncured EPOXONIC® EX 1355 can be removed with paper and then warm water, possibly with the addition of detergent. Hardened product residues can only be removed mechanically.

Table 2: Processing data for EPOXONIC® EX 1355

Sewer temperature [°C]	Resin temperature after mixing [°C]	Pot life [min]	Demoulding times [hours]
10 – 12	10	100	12
10 – 12	20	45	6
10 – 12	30	25	3 – 4

Please note: Both the processing time and the time until stripping depend on the ambient temperature. Longer stripping times may be necessary in the case of groundwater flushing. Damaged areas may generally only be exposed to the HD flushing carriage after at least 10 days.

Table 3: Properties of cured EPOXONIC® EX 1355

Technical data	Value	Norm
Shore-hardness (23 - 25°C)	Shore D 75	DIN EN ISO 868
Density ¹	1.34 g/cm ³	EN ISO 1183
Raw-density ¹	1.32 g/cm ³	SN EN 196
Adhesive tensile strength on concrete dry surface ²	3.2 MPa	DIN EN 1542
wet surface ²	2.7 MPa	
concrete, water-saturated ¹	3.3 MPa	SN EN 1542
Compressive strength ¹	69.4 MPa	SN EN 196
E-modulus (compressive) ¹	1420 MPas	SN EN 196
Flexural tensile strength ¹	35.0 MPa	SN EN 196 (40 mm thickness)
Abrasion behaviour		
Volume-loss ¹	7.5 cm ³ /50 cm ²	DIN 52108
average thickness-loss ¹	1.5 mm	
Shear strength ²	23.8 MPa	

¹ LPM AG, Beinwill am See, Schweiz, Research report No. A-33`881-2 from 12-23-2008.

² TU München, Baustoffinstitut, Dr. Letsch, Research report 2527a-98 from 11-02-1998.

Delivery form:

EPOXONIC® EX 1355 is supplied in part A and B as a set in the correct mixing ratio.

Part A	3-litre cans
Part B	welded aluminium/plastic bags
- big	2.73 kg part A + 0.91 kg part B
- small	1.66 kg part A + 0.55 kg part B

Storage

EPOXONIC® EX 1355 part A and part B can be stored for 12 months at 0 - 35 °C, ideally at ≤ 25 °C in closed original containers in a dry place. Avoid direct sunlight.

Safety instructions

The safety precautions and personal protection measures to be observed when processing epoxy resins and hardeners apply; in particular, protective gloves must be used and skin and eye contact must be avoided. Do not eat, drink or smoke while working.

Further information can be found in our safety data sheets and the hazardous substance information system of the BAU trade association (Gisbau). Please pay particular attention to the technical data sheet and the "Practical guide for handling epoxy resins", available at

https://www.bgbau.de/fileadmin/Gisbau/676_Praxisleitfaden-Epoxidharze_2-2018.pdf (German)

Important user information

The information in this data sheet is provided to the best of our knowledge, but to the exclusion of any liability. It is not intended as an authorisation for licence-free use, but merely as a working aid for the user, who should carry out his own tests to determine the suitability of the product for his specific requirements.