

EPOXONIC®

EX1824 NF

Formwork resin for sewer renovation

EPOXONIC® EX 1824 NF is a solvent-free, 2-part formwork resin based on epoxy resin amine with a particularly low density. It is slightly flexibilised and has a high internal toughness, which enables the material to compensate for minor mechanical stresses. It was specially developed for robot technology.

Key-features:

Especially for robot applications
Good workability for injection and filler
Adhesion to wet concrete and stoneware
Also adheres to PVC and pipe liners
Low density ~1.2 g/cm ³
Curing possible from +8 °C
Curing under water
Low shrinkage
Free of solvents and nonylphenol
Resistant to e.g. household waste water, oil and petro
Hot water resistant

Recommended applications:

EPOXONIC® EX 1824 NF is particularly suitable for the rehabilitation of damaged side inlets in wastewater, combined and rainwater sewers in nominal sizes DN 150 to DN 800 using robot technology. The sewers can be made of vitrified clay, sewer clinker, concrete, fibre cement, reinforced concrete, inliner or PVC.

With EPOXONIC® EX 1824 NF, fast and complete filling is achieved when using formwork for the renovation of side inlets. Thanks to the medium curing speed and long working time, it can also be used to repair larger breakouts.

The use of heated moulds is possible if the maximum curing temperatures are adhered to.

Approval:

DIBt-Approval Z. 42.3-599 dated 18 July 2023 is available for EPOXONIC® EX 1824 NF.

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 1824 NF

Technical data	Part A	Part B	Mixture	Norm
Appearance	paste-like	paste-like	paste-like	
Colour	medium blue ¹	greyish-brown ¹	medium blue ¹	
Mixing ratio (parts by weight)	100	30		
Density [g/cm ³]	1.24 ± 0.05	0.95 ± 0.05	1.16 ± 10 %	DIN EN ISO 1183-1

¹ minor differences in colour are due to technical reasons and do not affect the quality

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 dirty waste water before the application of the resin compounds has been completed. 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.

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 milled back for optimised anchoring of the resin. 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 compound appears uniformly blue. We recommend the use of a mixer with a helical, spiral-shaped kneading tool and low rotation

speed of about ca.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 stripping time can be determined.

Working time resp. pot life

The working time resp. pot life can be found in table 2. Processing is generally possible 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 very delayed. Caution! At mixing temperatures above 25 °C, the working time is considerably reduced! When applying (levelling) on a wet surface, the material must be pressed on for \geq 10 seconds to achieve initial adhesion.

Injection

EPOXONIC® EX 1824 NF can be processed using suitable formwork technology (e.g. formwork collar and formwork 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.

Cleaning the devices

Uncured EPOXONIC® EX 1824 NF 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 1824 NF

Property / parameter				
Material temperature [°C]	15	20	25	30
Sewer temperature [°C]	5	8	10	12
Operating time [min]	50	40	30	20
Switch-off time [h]	10 – 13	8 – 10	6 – 7	5 – 6
Curing time [days]	approx. 10	approx. 10	approx. 10	approx. 10

The values stated are approximate values. Thin layers cure more slowly.

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 1824 NF

Property / parameter	Value	Norm
Shore hardness type D (23-25°C)	≥ 69	DIN EN ISO 868
Density [g/cm³] (25°C)	1.16 ± 10 %	DIN EN ISO 1183-1
Adhesive tensile strength [MPa]		
on dry concrete pipe	≥ 3	DIN EN ISO 4624
on GFK-pipe/pipe liner	≥ 5.8	DIN EN ISO 4624
on dry stoneware tube	≥ 10	DIN EN ISO 4624
on wet concrete	approx. 3	DIN Spec 19554
Flexural-E-modulus [MPa]	≥ 4,000	DIN EN ISO 178
Compressive strength [MPa]	≥ 40	DIN EN ISO 604
Heat distortion temperature [°C]	52 ± 1	DIN EN ISO 75-2
Shrinkage behaviour	≤ 0.2 %	ISO 2377:2007-12

Delivery form:

EPOXONIC® EX 1824 NF 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	2.51 kg part A + 0.75 kg part B

Storage

EPOXONIC® EX 1824 NF part A and part B can be stored for 12 months at 2 - 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.