

MINING / CONSTRUCTION

CARBOTHIX 2

TWO-COMPONENT SILICATE RESIN

DESCRIPTION

Instantly thickening, fast curing two-component silicate resin for grouting of bolts. CARBOTHIX 2 is CFC- and halogen-free.

CARBOTHIX 2, Component A is a special sodium silicate with additives. CARBOTHIX 2, Component B is a modified polyisocyanate.

The relatively low e-modulus of the resin, combined with high strength, provides a uniform transfer of local rock stresses over the whole length of the bolt rod.



APPLICATION AND USE

- Sealing of injection bolts, e.g. Wiborex (steel) or FRP-Rods (“grout into bolt”)
- Sealing of roof bolts (“bolt into grout”)
- and many more special applications

ADVANTAGES

- Fast reacting
- High strength
- Easy to pump with dosing pumps
- Intermediate fixation of the bolt is not required
- Fast loading capacity of the bolt
- No dripping in overhead application

TECHNICAL DATA

The below data are laboratory data. They may vary in practice due to thermal exchange between resin and strata, surface properties of the rock, humidity, pressure, and other factors.

MATERIAL DATA

| Parameter | Unit | Comp. A | Comp. B | Standard |
|--------------------|-------------------|-----------------|-----------|-----------------|
| Density at 25 °C | kg/m ³ | 1460 ± 50 | 1160 ± 50 | DIN 12701 |
| Colour | - | brownish-turbid | brown | - |
| Flash point | °C | - | > 100 | DIN 53213 |
| Viscosity at 25 °C | mPa*s | 310 ± 50 | 190 ± 40 | DIN EN ISO 3219 |

REACTION DATA*

| Starting temperature | Open time | Mix viscosity after 10 s |
|----------------------|------------|--------------------------|
| 30 °C | 40 s ± 5 s | > 100.000 mPa*s |

* In house testing

TENSILE FORCE

| Time | 15 min | 30 min | 60 min | 2 h | 4 h |
|---|--------|--------|--------|-----|-----|
| % of bolt tensile force (referring to 4h) at 25 °C ² | 50 | 70 | 90 | 100 | 100 |

MECHANICAL DATA

| Parameter (25°C) | 4 h |
|------------------------|-----------------|
| Modulus of Elasticity* | approx. 200 MPa |
| Shear Strength* | approx. 14 MPa |
| Shore Hardness* | D 60 |

* In house testing

In pull tests according to DIN 21 521 with 25 mm diameter threaded bolts (GEWI) a pull-out force of 360 kN was achieved on 600 mm grouted length in a 32 mm hole after 4 h as well as 7 d. In a 42 mm hole, 265 kN were achieved.³

APPLICATION METHOD

The two components are pumped by a dual component pump at the volumetric ratio of 1 : 1 and mixed thoroughly in a static mixer.

Mixer

- with pulsation pumps, e.g. CT-DP 40 one static mixer tube (32 parts, Ø 13)
- with pulsation-free pumps, e.g. CT-PM two static mixer tubes in row (64 parts, Ø 13)

a) Grouting of injection bolts (“grout into bolt”)

The mixed resin is injected into the hole bottom via the injection channel (core of the tubular bolt or attached injection hose), thus filling the annular space and the adjacent large cracks.

b) Grouting of roof bolts (“bolt into grout”)

The drill hole is filled using a filling lance or hose with the appropriate amount of resin. Immediately afterward, during the open time, the bolt rod is pushed into the resin mass. An intermediate fixation of the bolt is not required. The length of the lance/hose (DN 10) should not exceed 5 m.

In the container, a thin film of polyurea may form on the surface of Component B, but this will not affect pump suction.

After mixing the two components, the resin instantly achieves a grease-like viscosity level so that the mix stops flowing, even in large fissures, and requires pump pressure for displacement. The mix then hardens to form a hard resin.

For detailed instructions on use in particular before a change of the injection resins, consult the „Technical handbook for the safe use of injection resins in the mining sector “.

The regulations and references from the Approval of the District government Arnsberg are to be considered.

SAFETY INSTRUCTIONS AND LIMITATIONS

Observe the usual precautionary measures for handling chemicals, see MSDS of CARBOTHIX 2 Component A and Component B.

This product is designed, manufactured and sold specifically and exclusively for use in drilled boreholes in underground mine and tunnel applications. When the product is exposed to open air wet conditions outside of the confined space of a borehole, or if there is not sufficient coverage of rock and earth surrounding the product in the borehole in wet conditions, the product could swell, contract, crack and become destabilized. Any use of this product outside of a fully encircled bore hole is at the user’s sole risk and responsibility and Minova disclaims all liability.

PACKAGING AND TRANSPORTATION

All forms of packing are approved to the danger goods regulation road, railway, domestic shipping.

The components can be delivered in 20/26/200/1000 l units.

Other packaging units are available on request. Details are shown in the offer.

STORAGE AND SHELF LIFE

At least six months from date of delivery when stored in a dry place between 10 °C and 30 °C. If this time is exceeded, we recommend having the material checked by Minova for compliance with specification.

DISPOSAL

Follow local regulations.

APPROVALS AND CERTIFICATES

1. LOBA Approval of the District Government of Arnsberg 62.12.22.67-7-4
2. Report on short bolt pull tests (DMT, U1135CTM1)
3. Report on bolt pull tests according to DIN 21 521 (DMT, Essen)

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ADDITIONAL DOCUMENTATION

- Operating instructions on proper use of Minova injection resins
- Technical handbook for the safe use of injection resins in the mining sector
- MSDS CARBOTHIX 2 Component A
- MSDS CARBOTHIX 2 Component B

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