

TECHNICAL DATA SHEET

CARBOTHIX 2

Approval of the German Mining Authority 62.12.22.67-7-4

Uses

Instantly thickening, fast curing two-component silicate resin for sealing bolts, CFC- and halogenfree.

It will quickly reach the final strength of the adhesive with CARBOTHIX 2.

Suitable for:

- Sealing of injection bolts, e.g. Wiborex (steel) or FRP-Rods ("grout into bolt")
- Sealing of roof bolts ("bolt into grout")

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.

Technical Data

The above 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.

Reaction data

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

Material data

		Component A	Component B
Density at 25 °C	kg/m ³	1460 ± 50	1160 ± 50
Colour		brownish-turbid	brown
Flash point	°C	-	> 100
Viscosity at 25 °C	mPa*s	310 ± 50	190 ± 40

Mechanical data

Time	15 min	30 min	60 min	2 h	4 h
Strength in % at 25 °C	50	70	90	100	100
Modulus of Elasticity					approx. 200 MPa
Shear Strength					approx. 14 MPa
Shore Hardness					D 60

In pull tests according to DIN 21 521 with 25 mm dia threaded bolts (GEWI) a pull out force of 360 kN were 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.²

Composition and Properties

Components

CARBOTHIX 2, comp. A, is a special sodium silicate with additives.

CARBOTHIX 2, comp. B, is a modified polyisocyanate.

System

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.

Final product

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

Processing

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 tubes (32 parts, Ø 13), l ≈ 320 mm
with pulsation-free pumps, e.g. CT-PM/A	two static mixer tubes in row (64 parts, Ø 13), l ≈ 640 mm

- a) Sealing 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) Sealing of roof bolts (“bolt into grout”)

The drillhole 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 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.

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 form the Approval of the District government Arnsberg are to be considered.

Risk and safety phrases for the handling of CARBOTHIX 2

Observe the usual precautionary measures for the handling of chemicals, see MSDS.

Packing

All forms of packing are approved to the danger goods regulation road (GGVS).

Component A	Component B
16 l in a can (green cap)	16 l in a can (black cap)
200 l in a drum	200 l in a drum
1000 l in a refillable container	1000 l in a refillable container

Other packing units on request.

Storage, Shelf-Life

At least six months from date of delivery or twelve months from date of production when stored in a dry place between -5 °C and 30 °C. If this time is exceeded, we recommend having the material checked by Minova CarboTech for compliance with specification.

Disposal

Follow local regulations.

We recommend either to dispose of liquid residues in an incineration plant (EU disposal code 070208 "other reaction and distillation residues") or to cure the liquids in ratio Comp. A : water : Comp. B = 2 : 1 : 2 and dispose of the cured foam in a domestic waste landfill or an incineration plant (EU disposal code 20 01 39).

Empty cans should be cleared of liquid by punching a hole through the edge of the cover and turn them upside down, until no liquid flows out any longer.

Expertise and Test Reports

1. Approval of the German Mining Authority 62.12.22.67-7-4
2. Report on bolt pull tests according to DIN 21 521 (DMT, Essen)

The data in this sheet conform to our best knowledge and experience at the date of printing, which is indicated below. The state of knowledge and experience are evolving constantly. Please pay attention therefore, that you always refer to the current version of this data sheet.

The description of the product application in this sheet cannot take the special conditions and circumstances into account emerging from the individual case. Please check our product therefore in any case prior to use for its aptitude in the actual application. Application, use and processing of our product occur outside of our control capabilities. That is why they as well as the processing result achieved based on our information are exclusively subject to your own responsibility.

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Technical Support

We provide a technical advisory service by a team of specialists in the field. The service includes on site assistance and advice on evaluation trials and laboratory work.

Additional Information

Started more than 40 years ago, Minova is a global manufacturer and supplier of chemical and mechanical earth control products, adhesives and support equipment. With manufacturing plants on five continents and operations in more than 25 countries, Minova is an industry-leading provider of ground support solutions for the underground mining, construction, tunneling and civil engineering industries. Minova is wholly owned by Orica Limited.

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