

CONSTRUCTION

CarboStop 402 – CarboStop 402 ACC

WATER-REACTIVE ONE-COMPONENT RESIN & REACTION ACCELERATOR

DESCRIPTION

CarboStop 402 is a water-reactive one-component resin. CarboStop 402 is solvent- and CFC- free.

CarboStop 402 resin consists of modified isocyanates with additives. CarboStop 402 ACC is a catalyst mixture designed to adapt the reaction speed to the situation. After the addition of the catalyst, the mixture has a shelf life of at least 48 hours, when completely protected from moisture or direct contact with water.

CarboStop 402 is characterized by his high flexibility and elasticity. To adapt the reaction speed the accelerator CarboStop 402 ACC is added to the resin and mixed before pumping.

The reaction starts after contact with water. The reacted material has a high amount of closed cells under compressed and free rise conditions.

APPLICATION AND USE

CarboStop 402 is used for sealing in tunnels and underground constructions. Is is also used in geotechnical and water constructions, as well as in off-shore constructions.

- Stopping of water inflow (also salt water) under high pressure and speed
- Stabilisation and sealing of loose rock
- Sealing of cracks and joints
- Deep injection
- Suitable for the injection of medium-fine to larger cracks, fissures, honeycombs and joints
- Injections of man-accessible sewer lines and tubes

ADVANTAGES

- CFC, halogen, phtalate free
- Due to separate available catalyst product can be adjusted to conditions on application site
- Reacting fast with water
- Works with high pressure water
- Crack injection in 0.3 mm width (14 d, 3°C) fulfills the performance characteristics of `Adhesion and elongation of ductile crack fillers` >10%
- Grouts fine to grained sands

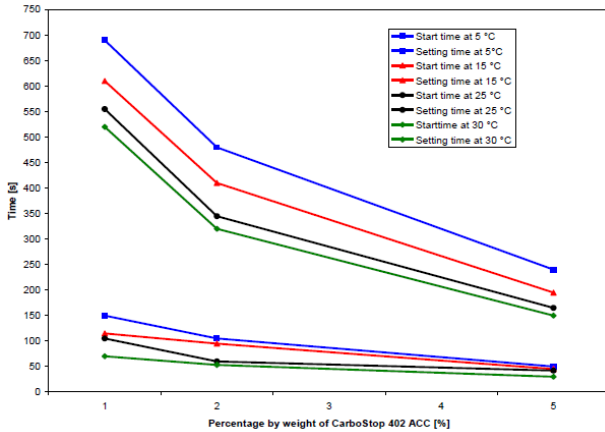
TECHNICAL DATA

The data below are laboratory data. They may vary in practice due to thermal exchange between the resin and strata, surface properties of the stone, (humidity) contamination deque of water and other factors.

MATERIAL DATA

Parameter	Unit	CarboStop 402	CarboStop 402 ACC	Standard
Density at 25 °C	kg/m ³	1035 ± 20	1015 ± 20	DIN 12791
Colour	-	yellow, transparent	yellowish, transparent	-
Flash point	°C	-	-	DIN 53213
Viscosity at 5 °C	mPa*s	3100 ± 50	66 ± 17	EN ISO 3219
Viscosity at 10 °C	mPa*s	2000 ± 50	49 ± 12	EN ISO 3219
Viscosity at 15 °C	mPa*s	1350 ± 50	38 ± 10	EN ISO 3219
Viscosity at 20 °C	mPa*s	970 ± 50	30 ± 8	EN ISO 3219
Viscosity at 25 °C	mPa*s	740 ± 50	25 ± 6	EN ISO 3219

REACTION TIMES AS A FUNCTION OF TEMPERATURE AND CATALYST CONCENTRATION



REACTION DATA

Percentage by weight of CarboStop 402 ACC	[%]	1.00	2.00	5.00
Temperature 5 °C				
Start time	[s]	150	105	50
Setting time	[s]	690	480	240
Temperature 15 °C				
Start time	[s]	115	95	45
Setting time	[s]	610	410	195
Temperature 25 °C				
Start time	[s]	105	60	42
Setting time	[s]	555	345	165
Temperature 30 °C				
Start time	[s]	70	53	30
Setting time	[s]	520	320	150

All measurements regarding MCT PV10-305. The reaction has been triggered by the addition of 10 %, clean tap water, to the freshly prepared blend. Specific contaminants in the water on the site may give different reaction times.

Foaming factor (free rise) at 25 °C	approx. 11
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MECHANICAL DATA

Parameter	Unit	CarboStop 402 + 5% CarboStop 402 ACC	Standard
Tensile strength (adhesive strength) crack width: 0.3 mm	N/mm ²	0.26 - 0.31	EN 12618-1
Tensile strength (adhesive strength) crack width: 0.5 mm	N/mm ³	0.18 - 0.24	EN 12618-1
Elongation capacity crack width: 0.3 mm	%	20 - 32	EN 12618-1
Elongation capacity crack width: 0.5 mm	%	17 - 25	EN 12618-1

PROPERTIES

CarboStop 402 reacts on contact with water, see information "Reaction time", to form a polyurethane/polyurea product.

In practical application the foaming factor depends mainly on the counter-pressure in the medium, by the mechanical pressure generated by the pumping system, or by the contained expansion of reacting resin. The foaming factor is generally higher in wide cracks or in loose gravel, while fine cracks or sand will restrict the expansion factor. The density, rigidity and general strength of the foam will increase exponentially. It is in all cases advised to restrict the free expansion by the maintaining of sufficient back pressure. The foaming factor of the grout mix is not altered by the turbulence of the water streams.

APPLICATION METHOD

CarboStop 402 ACC must be added for a controlled start of the reaction.

Before the start of the pumping, the CarboStop 402 ACC is added in predestined quantity to the resin CarboStop 402. Herewith the reactivity of the grout can be adjusted to the given situation. Both components have to be mixed thoroughly. The prepared grout mixture can be stored for at least 48 hours without significant increase in viscosity under the condition that the grout mix is efficiently protected from moisture and water.

However, a skin may form on surface of the liquid surface, due to reaction with the moisture in the air. This has generally no further effect on the

resin underneath, but we recommend to skim this skin and also prevent obstructions in the pump.

The mix of CarboStop 402/CarboStop 402 ACC is injected as a one-component grout that reacts strongly and hardens after the contact and interaction with a sufficient quantity of water. Should the area to be sealed contain an insufficient quantity of water to trigger all the elements of the resin, then a complete reaction of the CarboStop 402 can be achieved by pre-, simultaneous-, or post-injection with water.

When compared to two-component systems, the CarboStop 402 contained in the high-pressure hose does not harden out. However, please assure yourself that the valves are closed so that no water can enter the hose and trigger the reaction of the grout.

Nevertheless, we always advise to flush the pump with the cleaner CarboSolv D to prevent the pump and valves from sludging.

Should the interruption exceed one day, we'll always advise to lubricate the internal parts of the pumps and the hoses with CarboSolv S as well.

It needs to be assured that the product temperature is between 15 and 30 °C before processing and during application.

When the material is warmed up, local overheating, e. g. at the container wall, must be avoided.

SAFETY INSTRUCTIONS AND LIMITATIONS

Observe the usual precautionary measures for handling chemicals, see MSDS CarboStop 402 and CarboStop 402 ACC.

PACKAGING AND TRANSPORTATION

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

CarboStop 402 can be delivered in 18/200/1000 l units. CarboStop 402 ACC is delivered in 1/5 l units.

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

STORAGE AND SHELF LIFE

CarboStop 402 and CarboStop 402 ACC are a moisture-reactive system and very sensitive to contact with moisture and humidity. Therefore they are filled under a protective blanket of dry nitrogen. The components can be stored for at least 12 months when kept at 10 - 30°C dry and in closed original package. Once opened, the components should be used as soon as possible.

The local legislation on storage has to be observed

DISPOSAL

Follow local regulations.

APPROVALS AND CERTIFICATES

1. DIBT: German approval as curtain injection Z-101.29-47 (2019)
2. Expertise on compatibility with groundwater according to DIBt regulation (Hygiene-Institut, Gelsenkirchen, 2019)
3. Hygienic drinking water test acc. to DIN EN 12873-1:2014-09 and DIN EN 1420:2016-05 (Hygiene-Institut, Gelsenkirchen, 2022)
4. Test report according to BS 6920:2000 No. MAT/LAB 552C/1 (WRc-NSF Ltd., UK, 2011)
5. Tests of adhesion and elongation capacity according to EN 12618-1 (University Duisburg-Essen, 2011)

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ADDITIONAL DOCUMENTATION

- Operating instructions on proper use of Minova injection resins
- MSDS CarboStop 402
- MSDS CarboStop 402 ACC

CUSTOMER SERVICE

For additional support options available at your area, contact our local offices:

www.minovaglobal.com/emea-cis