

CONSTRUCTION / ENERGY

CarboPur WS

TWO-COMPONENT POLYURETHANE INJECTION RESIN

DESCRIPTION

Fast reacting two-component injection resin according, CFC-free and halogen-free, for sealing and consolidation in dry, water-bearing strata and against water under pressure.

CarboPur WS consists of a component A and a Component B. CarboPur WS component A is a mixture of various polyols and additives, which reacts with the CarboPur component B to a tough-rigid polyurethane resin. CarboPur Component B is a polyisocyanate.



APPLICATION AND USE

- Consolidation in dry, wet and water-bearing strata
- Sealing against water under hydrostatic pressure from strata, dams or shaft walls, also against salt-water
- Repair of wet shafts, tunnels, channels and walls

ADVANTAGES

- CarboPur WS is characterized by a very fast setting / immediate sealing effect
- Stabilising effect
- Due to the volume ratio 1:1 a simple and safe processing is possible
- Due to the inertia of the material and the absence of toxic reactions, there are no objections against CarboPur WS coming in contact with ground or surface water
- CarboPur WS fulfils fire test to DIN 4102-1 construction material class B2 (normal flammability)

TECHNICAL DATA

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

MATERIAL DATA

Parameter	Unit	Comp. A	Comp. B	Standard
Density at 25 °C	kg/m ³	1000 ± 30	1230 ± 30	DIN 12791-1
Colour	-	honey	dark brown	-
Flash point	°C	> 150	> 150	DIN 53213
Viscosity at 30 °C	mPa*s	220 ± 50	160 ± 50	ISO 3219
Viscosity at 25 °C	mPa*s	290 ± 50	200 ± 50	ISO 3219
Viscosity at 15 °C	mPa*s	650 ± 100	550 ± 100	ISO 3219

REACTION DATA

Starting temperature	End of foaming / setting time	Foaming factor	Test Method
without contact to water			
15 °C	1 min 50 s ± 20 s	< 1,5	MCT PV 10-301
25 °C	50 s ± 15 s	< 1,3	MCT PV 10-301
30 °C	40 s ± 10 s	< 1,3	MCT PV 10-301

REACTION DATA WITH CONTACT OF WATER

Starting temperature	Start of foaming	End of foaming / setting time	Foaming factor	Test Method
with contact to water (1% relative to mix)				
15°C	35 s ± 15 s	1 min 35 s ± 30 s	5 ± 2	MCT PV 10-301
25°C	20 s ± 15 s	1 min ± 20 s	6 ± 2	MCT PV 10-301
with contact to water (2% relative to mix)				
15°C	35 s ± 15 s	1 min 30s ± 30 s	7 ± 2	MCT PV 10-301
25°C	20 s ± 15 s	1 min ± 20 s	9 ± 2	MCT PV 10-301

MECHANICAL DATA

Parameter	Value	Standard
Adhesive strength (dry surface, 30 °C, 80 % rel. F.)	1,0 MPa after 30'	DMT-Method
Flexural strength 2 % deformation (unfoamed) (2d/RT)	> 25 MPa	ISO 178
Shore hardness D (2d/RT)	> 75	ISO 7619-1
Compression strength 10 % deformation (2d/RT)	> 50 MPa	ISO 604
Fire class	B2	DIN 4102-1

APPLICATION METHOD

The two components CarboPur WS component A and CarboPur component B are pumped by a dual component pump at the volumetric ratio 1 : 1; they are mixed thoroughly in a static mixer unit prior to injection into strata via a packer installed in a previously drilled borehole.

In contact with water, the resin foams up. The following reaction mix displaces then the preceding one. Since the mixture does not meet any more water, it hardens without foaming to form a pore-free material. Thus, a water-tight shell is foamed which, in turn, is surrounded by a zone consolidated by foamed-up polyurethane. This means that only one application cycle with one material is necessary for arriving at permanent sealing and consolidation.

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

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

With strong outflow of water or in case of cold water the use of CarboPur WFA or CarboPur WT is recommended.

SAFETY INSTRUCTIONS AND LIMITATIONS

Observe the usual precautionary measures for handling chemicals, see MSDS of CarboPur WS component A and CarboPur component B.

If the product is strong cooled down ($< 0\text{ }^{\circ}\text{C}$) or at short notice lower temperatures ($< -10\text{ }^{\circ}\text{C}$), it should be warmed up before application to the recommended processing temperature.

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 $10\text{ }^{\circ}\text{C}$ and $30\text{ }^{\circ}\text{C}$. When this time is exceeded, we recommend having the material checked by Minova for compliance with specification.

The local legislation on storage has to be considered.

DISPOSAL

Follow local regulations.

APPROVALS AND CERTIFICATES

1. **DIBt:** German approval as curtain injection Z-101.29-26
2. Expertise on compatibility with groundwater according to DIBt regulation (Hygiene-Institut, Gelsenkirchen, 2019)
3. Test certificate No. PZ 3.1 / 15-303-1 (MFPA Leipzig, 2015) test on standard inflammability (construction material class B2) acc. to DIN 4102-1

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ADDITIONAL DOCUMENTATION

- Operating instructions on proper use of Minova injection resins
- MSDS of CarboPur WS component A and CarboPur component B

CUSTOMER SERVICE

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

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