MINOVA

CARBOPUR WFA

TWO-COMPONENT POLYURETHANE
INJECTION RESIN

DESCRIPTION

CarboPur WFA is an extremly fast reacting two component injection resin used for sealing and stabilizing in dry and water bearing strata. CarboPur WFA is CFC-free and halogen-free.

CarboPur WFA, Component A is a mixture of various polyols and additives which reacts with the B-component to form a tough/hard polyurethane resin. CarboPur. Component B is a polyisocyanate.

APPLICATIONS AND USES

CarboPur WFA is compatible with concrete and steel. This resin is designed for sealing and consolidation in water-bearing strata and for:

- Consolidation in dry, wet and waterbearing strata
- Sealing against strong water ingress (also seawater)
- Sealing against water under pressure e.g. from strata, dams or shaft walls
- Stabilization and sealing work in tunnels
- Repair of old shafts and tunnels
- Stabilisation of crown abutments in tunnelling
- Sealing of anchoring of sheet pilings etc. in ground water

ADVANTAGES

- Very fast setting and immediate sealing effect
- Stabilizing effect
- For wide-ranging injections
- Compatible with CarboPur WF and WT
- Groundwater hygiene tested
- CarboPur WFA fulfils the fire examination according to DIN 4102-1 – Building material class B2 (normally inflammable)
- Applicable at temperatures between -25 °C and +30 °C, recommended for sealing water at low temperatures.

TECHNICAL DATA

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

TECHNICAL PROPERTIES

PARAMETER	UNIT	COMP A	COMP B	STANDARD
Density at 25 °C	kg/m3	1010 ±30	1230 ±30	DIN 12791-1
Colour	-	honey	dark brown	-
Flash Point	°C	> 150	> 150	DIN 53213
Viscosity at 25°C	mPa*s	200 ±50	200 ±50	ISO 3219
Viscosity at 15°C	mPa*s	430 ±100	550 ±100	ISO 3219
Viscosity at 10°C	mPa*s	640 ±150	920 ±150	ISO 3219
Surface tension (20 °C)	mN/m	36	48	EN 4210

MECHANICAL DATA

PARAMETER	VALUE	STANDARD	REFERENCE
Compression strength (unfoamed)	80 ± 10 MPa	ISO 604	*
Upsetting at break	10 ± 1.0 %	ISO 604	*
Compression strength (foam factor 1.7)	20 ± 5 MPa	ISO 604	*
Compression strength (foam factor 2.1)	14 ± 4 MPa	ISO 604	*
Upsetting at break	10 ± 1.0 %	ISO 604	*
Tensile strength (unfoamed)	50 ± 10 MPa	ISO 527	*
Elongation at break (unfoamed)	2.3 ± 0.5 %	ISO 527	*
Adhesive strength (dry surface, 30 °C, 80 % rel. h.)	"> 6,5 MPa after 1 h"	"DMT-Method"	1
dyn. E-Modulus (unfoamed)	~ 2500 MPa	EN 14146	4
dyn. E-Modulus (foam factor 3)	~ 200 MPa	EN 14146	4
Creep (2 MPa load, 40 d; unfoamed)	0.001	DIN 4093	5
Creep (2 MPa load, 40 d; foam factor 1.7)	0.002	DIN 4093	5
Creep (2 MPa load, 40 d; foam factor 2.1)	0.003	DIN 4093	5
Shore Hardness	D 78 ± 5	ISO 7619-1	*

* In house testing

CarboPur WFA can take a continuous load of 2 MPa at a foaming factor of 2.1 with the deformation increase in seven days being less than 0.02 %.

REACTION DATA

STARTING TEMPERATURE TEST METHOD	END OF FOAMING / SETTING TIME	FOAMING FACTOR	TEST METHOD
WITHOUT CONTACT TO WATER			
10 °C	45 s ±5 s	1.0 - 1.3	MCT PV 10-301
15 °C	35 s ±5 s	1.0 - 1.3	MCT PV 10-301

REACTION DATA WITH CONTACT OF WATER

STARTING TEMPERATURE TEST METHOD	START OF FOAMING	END OF FOAMING / SETTING TIME	FOAMING FACTOR	TEST METHOD
WITH CONTACT TO WATER (1% RELATIVE TO MIX)				
10 °C	50 s ± 10 s	1 min 20 s ± 20 s	3-8	MCT PV 10-301
15 °C	40 s ± 10 s	1 min ± 20 s	3-8	MCT PV 10-301
WITH CONTACT TO WATER (2% RELATIVE TO MIX)				
10°C	55 s ± 10 s	1 min 25 s ± 20 s	3-15	MCT PV 10-301
15°C	40 s ± 10 s	1 min 10 s ± 20 s	3-15	MCT PV 10-301

APPLICATION METHOD

The two components are pumped by a dual component pump at the volumetric ratio of 1 : 1, they are mixed thoroughly in a static mixer unit prior to injection into the 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 this mixture does not meet any more water it hardens without foaming to form a pore-free material. Thus, a water-tight shell is formed 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.

The mixed resin penetrates the structure to be sealed. The major part of water in there is displaced due to the hydrophobicity and the viscosity of the resin. Traces of water make the resin foam.

According to its contact with water, the resin foams up more or less. Thus, the mechanical properties vary a lot. The cured resin is resistant against many acids, alkali and salt brines as well as organic solvents (if in doubt consult your nearest Minova representative)

It needs 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 by any means.

SAFETY INSTRUCTIONS AND LIMITATIONS

Observe the usual precautionary measures for handling chemicals, see MSDS of CarboPur WFA component A and CarboPur component B. If the product is strong cooled down (< 0 °C) or at short notice lower temperatures (< -10 °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 °C and 30 °C. When this time is exceeded, we recommend having the material checked by Minova for compliance with specification. The local legislation on storage needs to be considered.

DISPOSAL

Follow local regulations.

MANUFACTURER

Minova USA Inc
An ISO 9001:2015
Quality Management Certified Company
Certificate No. FM 686583

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CUSTOMER SERVICE

Minova USA Inc

150 Summer Court

Georgetown, Kentucky

KY 40324

Email: minovana.customerservice@minovaglobal.com