Sil-Pur® 80

ORGANIC-MINERAL ADHESIVE

TECHNICAL DATA SHEET (TDS)

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1. PRODUCT DESCRIPTION

The two-component organic-mineral adhesive SIL-PUR 80 is intended for use in methane-bearing and non-methane-bearing underground mining operations, in areas classified as 'a', 'b' and 'c' for methane explosion risk and as A and B for coal dust explosion risk.

POLY COMPONENT (silicate mixture)	SIL-PUR 80
ISO COMPONENT (isocyanate)	ISO KOMPONENT B

SIL-PUR 80 is a flame-retardant and self-extinguishing adhesive. It does not contain free formaldehyde or phenol.

2. APPLICATION

SIL-PUR 80 is intended for sealing, strengthening and consolidating fractured rock masses in conditions involving dry, damp, and water-bearing loosened rocks and coal seams. It is also used for strengthening earth embankments, slopes, rubble deposits, deep excavations, and sewer tunnels. It can also be used for sealing and bonding building structures, as well as for anchoring steel, strand, and cable bolts made of smooth and deformed steel.

3. CHARACTERISTICS OF THE COMPONENTS

POLY COMPONENT – a formulated mixture of silicates and additives, colourless liquid free from suspended solids.

ISO COMPONENT – a mixture of aromatic polyisocyanates, mainly diphenylmethane diisocyanate. A brown liquid, free from suspended particles.

Parameter	POLY	ISO	Unit
Density at 25°C	1,5 ± 0.10	1,22 ± 0.02	g/cm^3
Viscosity at 25°C	300 ± 200	210 ± 50	mPa·s

4. FOAMING CHARACTERISTICS UNDER LABORATORY CONDITIONS

Reaction times and expansion ratios were measured under laboratory conditions (at 20°C) by manual foaming in a laboratory vessel.

Volumetric mixing ratio of POLY:ISO components	**100 : 100**	
Parameter	**Value**	**Unit**
Start time	15–100 *	s
Gelling time (end of reaction)	80–190 *	s
Time to full cure	≤ 30	min
Expansion ratio	1,0	v/v

* It is possible to precisely set the reaction time intervals according to the customer's requirements

5. RECOMMENDED PROCESSING CONDITIONS

The product is intended for application using standard two-component injection units equipped with a dosing and mixing system for the components in the required 1:1 volume ratio. It is recommended to use pneumatic or hydraulic pumps designed for polyurethane resins.

Recommended parameters for the injection unit.

Unit type	Two-component (2K)	
Drive	Pneumatic	
Component mixing ratio	1:1 by volume	
Mixing type	Static mixer	
Intended use	Polyurethane and silicate resins	
Explosion-proof design	Compliant with the requirements applicable at the site of use	
Parameter	**Value**	**Unit**
Air supply pressure	0,4 - 0,8	MPa
Maximum working pressure of the material	80 – 250	MPa
Capacity	5-20	dm^3/min

Recommended conditions for carrying out injection work.

Volume ratio of POLY:ISO components	**100 : 100**	
Parameter	**Value**	**Unit**
Temperature of components	+15 to +25	°C
Ambient temperature	+5 to +40	°C
Rock temperature	+5 to +40	°C
Substrate moisture content	Permissible	
Active water ingress	Assessment of the system's suitability for local conditions required*	

* depends on the intensity of the inflow and the water pressure

Before proceeding with the preparation of the adhesive, please refer to the guidance and information contained in the Safety Data Sheets for both components.

SIL-PUR 80 adhesive is used for injection bonding in dry, damp and water-saturated coal seams and other rock formations. Work begins by drilling injection holes in the section of the working to be bonded (sidewall, floor or roof). This work is carried out using a standard mining drill bit or a Ø 42 mm drill rod with a handle, to a depth determined by local conditions and technical specifications. The holes are drilled at intervals of between 0,8 m and 6,0 m. The spacing and density of the borehole grid must be adapted to the geological and mining conditions on a case-by-case basis.

Injection tubes are inserted into the drilled holes and connected via suitable hoses to a mixing and pumping unit (piston pump). Using this system, the individual adhesive components are injected under high pressure (up to approximately 20 MPa) into the rock mass in a 1:1 volume ratio. Once the components have mixed, a cross-linking process takes place, resulting in the adhesive bonding firmly to the rock. This adhesive can also be used to seal existing fissures and cracks in rock and coal (without drilling holes) in order to stop water flowing out of them.

During the bonding process, the feed pressure of the components and the quantity of component in the reservoir must be monitored continuously (it is essential to ensure that one component does not run out whilst the other continues to be fed) – the components must be replenished on an ongoing basis to prevent air from entering the system, and to ensure that only one component is fed into the rock mass, or that it is fed in a ratio other than the specified 1:1 ratio. The condition of the rock mass must be monitored so that, should any additional cracks

appear or adhesive leak from existing ones, the injection process can be halted.
Once the work is complete, the entire injection system must be cleaned – flushed with hydraulic oil. It is recommended to leave the entire injection system (suction hoses, pump and discharge hoses) filled with hydraulic oil until bonding work resumes during subsequent shifts. The entire system must not be flushed with water. It is not permitted to swap the positions of the pump lines, suction hoses and discharge hoses. This will result in the pump becoming blocked. The pump lines for each individual adhesive component should be clearly marked.

6. PROPERTIES OF THE CURED ADHESIVE

Parameter	Value	Unit	Standard
Burning and glowing time	<5	s	EN 13463-1
Heat release (Q)	<60	nC	EN 13463-1

7. PACKAGING

Containers with a capacity of 20–30 dm³ made of steel or plastic.

8. RECOMMENDED STORAGE CONDITIONS

Both adhesive components should be stored in tightly sealed containers in dry rooms at a temperature of 15–30°C. Protect from moisture and direct sunlight. The shelf life of the POLY component in the manufacturer's original, unopened containers, when stored under the recommended conditions, is **6 MONTHS**.

9. REGULATIONS, ND CERTIFICATES

- Transport regulations apply in accordance with Section 14 of the product's Safety Data Sheet.

10. ADDITIONAL INFORMATION

The data contained in this technical information is based on the results of our laboratory tests and practical experience and do not constitute a guarantee of the properties of the final finished product. The results obtained may differ from those stated if the product is used under conditions other than those specified. We therefore recommend carrying out your own tests to verify the product's suitability for the specific application. The use of the adhesive and the conditions of its application are not controlled by the manufacturer; responsibility for their correct selection rests with the contractor. Guidelines for using the system are contained in the Technical Data Sheet (TDS) and Safety Data Sheets (SDS). Failure to comply with the conditions recommended by the manufacturer may adversely affect the bonding process and the adhesive's performance.

IMPORTANT: We are happy to provide technical and expert assistance with the implementation and use of the SIL-PUR 80 organic-mineral adhesive. Furthermore, where necessary, we assist with adapting and selecting the relevant parameters. For all matters relating to the purchase and use of the SIL-PUR 80 organic-mineral adhesive, we encourage you to contact a technical sales representative or by emailing prodex@pcc.eu.