

509 Z Rubber

Acrylate injection liquid with excellent tough, elastic and physical properties

1. Description

509 Z Rubber Acryl is a tough and elastic four-component acrylate-based injection fluid in which salt, rather than dissolving within water which is usually the case, instead produces a strengthening polymer blend producing excellent physical properties to gel masses.

2. Application

509 Z Rubber Acryl has been specifically developed for injecting structures in which waterproofing imposes strict requirements on the physical properties of the gel masses (fluctuating groundwater levels, settling of the concrete, expansion joints, etc.).

3. Properties

- Sealing injection of cracks, fissures and voids in concrete and masonry.
- Curtain injections (around tunnel segments, drainpipes, porous concrete structures, etc.).
- 509 Z Rubber Acryl is especially suitable for treating leaks in tunnels. These leaks can be due to expansion joints and fissures or cracks to concrete floor plates, walls or tunnel roofs.
- 509 Z Rubber Acryl has outstanding adhesion to mineral surfaces (concrete, brick). On contact with water expansion can amount to 290% of the original volume.
- Low viscosity allows deep penetration into fissures and cracks
- Good general chemical resistance
- Free from harmful solvents and non-flammable
- 509 Z Rubber Acryl gel masses have outstanding water retention capacity so there is no crack formation in the gel as a result of injected fissures and voids drying out under the influence of fluctuations in the groundwater level. As the salt is not dissolved in water, as is usually the case with acrylic injection resins, the gel mass improves physical properties - outstanding cohesion upon swelling, good stability, high water retention capacity, outstanding behaviour through wet-dry cycles, and improved tear strength in comparison to standard acrylate injection liquids.

4. Technical data (typical values)

Component A₁ (509 Z Rubber Acryl):

- Appearance: purple-pink liquid
- Viscosity (20 °C): 14 mPa.s
- Density: 1.15 g/ml
- pH: 6.5 - 8
- Solid matter content: 42% - 48%
- Fully miscible with water

Component A₂ (509 Z Rubber Acryl Cat):

- Appearance: pale-yellow liquid
- Viscosity (20 °C): 22 mPa.s
- Density: 1.11 g/ml
- Fully miscible with water

Stabila UK Ltd. Oxon. OX27 7SR
tel 01869 346010 fax 01869 345455

Component B (509 Z Rubber Acryl Init): white, water-soluble powder

Component C (509 Z Rubber Acryl Strengthener):

- Appearance: white liquid
 - Viscosity (20 °C): 15 mPa.s
 - Density: 1.033 g/ml
 - pH: 6.5 - 8
 - Solid matter content: 38% – 40%
 - Fully miscible with water
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- Elongation at fracture: > 50%
 - Minimum processing temperature: 5 °C
 - Watertightness under pressure (EN 14068): watertight at 2×10^5 Pa
 - Compatibility with concrete (EN 12637-1): pass (compatible with concrete)
 - Sensitivity to wet-dry cycles: the swelling reaches a constant level after 10 wet-dry cycles. A wet-dry cycle consists of 1 day of drying at 50 °C followed by 6 days of immersion in tap water at a temperature of 20 °C.
 - Swelling under water (EN 14498 A): the swelling reaches a constant level
 - Volume increase when kept under water (EN 14498): 137% after 10 days, 210% after 20 days, 290% after 36 days (end swelling) in tap water at a temperature of 20 °C.
 - Shelf life: 6 months after production date in the original, unopened and undamaged packaging. Stored between + 5 °C and + 25 °C in a dark place. If 509 Z Rubber Acryl is stored at temperatures higher than 25 °C the shelf life of 509 Z Rubber Acryl cannot be guaranteed.

5. Processing

The 509 Z Rubber Acryl system consists of four components:

- A₁: 509 Z Rubber Acryl (the resin)
- A₂: 509 Z Rubber Acryl Cat (the catalyst)
- B: 509 Z Rubber Acryl Init (the initiator)
- C: 509 Z Rubber Acryl Strengthener (the strengthening polymer blend)

Two solutions are made up for processing.

Solution 1:

This is a mixture of the 509 Z Rubber Acryl resin (component A₁) with the 509 Z Rubber Acryl Cat catalyst (component A₂).

Solution 2:

This is a mixture of the 509 Z Rubber Acryl Strengthener strengthening polymer blend (component C) with the 509 Z Rubber Acryl Init initiator (component B).

To produce the acrylate gel, these two solutions are mixed in a 1/1 volume ratio. 509 Z Rubber Acryl is injected into the crack, fissure or void with a two-component pump (manual, electric or pneumatic). Machine parts that come into contact with the resin should be made of stainless steel.

Reaction times (20 °C; at higher temperatures the gel time falls. At lower temperatures the gel time rises):

To change the reaction time, keep the quantity of catalyst constant and vary only the quantity of initiator.

Solution 1:

Add 0.45 L (0.5 kg) of catalyst (A₂ component) to 8.7 L (10 kg) resin (A₁ component).

Solution 2:

Add X kg of initiator (B component) to 8.7 L (9 kg) of strengthening polymer blend (C component).

x kg Initiator (B Comp) in 8.7L (9kg) Strengthening Polymer Blend (C Comp)						
	0.5kg	0.4kg	0.3kg	0.2kg	0.1kg	0.05kg
0.45 L (0.5kg) Catalyst (A2 Comp) In 8.7 L (10 kg) Of Resin (A1 Comp)	25 sec	31 sec	39 sec	45 sec	1 min 45 sec	2 min 35 sec

Prepare only as much solution 1 and solution 2 as can be used the same day.

6. Sizes and weights

- 509 Z Rubber Acryl (component A₁): 10 kg or 25 kg blue plastic jerry cans (this corresponds to 8.7 L or 21.8 L respectively).
- 509 Z Rubber Acryl Strengtheners (component C): 9 kg or 22.5 kg white plastic jerry cans (this corresponds to 8.7 L or 21.8 L respectively).
- 509 Z Rubber Acryl Initiator (component B): 0.625 kg plastic pots
- 509 Z Rubber Acryl Cat (component A₂): 0.5 kg (0.45 L) or 1.25 kg (1.13 L) plastic containers

7. Cleaning

Clean the equipment with water.

8. Precautions and safety recommendations

- Protect the product from UV light and sunlight and store between 5°C and 25°C.
- Do not use calcium-rich water for the B-component: calcium in the water accelerates gel formation.
- Irritant: wear safety goggles and gloves.
- In case of contact with the skin: wash with water and soap. Rinse well afterward.
- In case of contact with the eyes: rinse for several minutes with clean water. Consult a doctor.
- Mix surplus with sand and sawdust and dispose of according to local regulations.
- For more information we refer you to the safety information sheets for the various products.



EN 1504-5
U(S1)W(1)(1/2/3/4)(5/30)
Concrete injection product for swelling fitted filling of cracks

Watertightness	$\geq 2 \times 10^5$ PA
Workability - Viscosity	≤ 60 m Pa.s
Corrosion behaviour	Deemed to have no corrosive effect
Expansion ratio and evolution by water storage	Volume change: 290%
Durability – Sensitive to water	The expansion reaches a constant level
Durability – Sensitivity to wet-drying cycles	After the wet-drying cycles, the expansion reaches a constant level
Durability – Compatibility with concrete	Pass
Dangerous substances	Comply with 5.4