

Sika® Injection 451(IN)

Low viscosity injection resin

Product Description

Sika® Injection 451(IN) is a special solvent free, very low viscous epoxy injection resin for water proofing application.

Uses

Sika® Injection 451(IN) is suitable for closing, sealing and bridging of dry and damp cracks and cavities, where structural bond strength is required to restore structural integrity. It is suitable for use in concrete, brick and natural stone substrates, particularly in civil engineering structures, i.e. bridges, tunnels and shafts.

Characteristics / Advantages

- Very low viscosity (especially at low temperatures)
- Very good adhesion on dry and damp surfaces in most mineral substrates (i.e. concrete, masonry and natural stone etc)
- Excellent barrier against water infiltration and corrosion promoting media
- Due to its low viscosity it can penetrate into cracks >0.2 mm in width
- No subsequent shrinkage in dry conditions
- Solvent-free

Product Data

Form

Colours
Part A: colourless
Part B: Amber
Part A+B mixed: Amber

Packaging
1.0 kg (A+B) Pre-batched unit.
Part A: 0.80 kg Metal container
Part B: 0.20 kg Metal container

Storage

Storage Conditions/ Shelf-Life
12 months from date of production if stored properly in unopened, undamaged and sealed original packaging, in dry conditions at temperatures between +5°C and +40°C.

Technical Data

Chemical Base
Epoxy resin.

Mixed Density
~1.1 kg/l (at +27°C)

Viscosity
~ 170 MPa . s (at +30°C)



Mechanical / Physical Properties

Compressive Strength	~ 50.0 N/mm ² (after 7 days at +30°C)	(According to ASTM D 695)
Flexural strength	~ 45.0 N/mm ² (after 7 days at +30°C)	(According to ISO 178)
Tensile Strength	~ 35.0 N/mm ² (after 7 days at +30°C)	(According to ISO 527)
Tensile Elongation	~ 5 % (after 7 days at +30°C)	(According to ISO 527)
Tensile Modulus	~ 1600 N/mm ² (after 7 days at +30°C)	(According to ISO 527)
Bond Strength	<i>On Water Saturated Concrete</i> After 5 days storage in water at + 30°C : > 10 N/mm ² (failure in concrete) <i>On Water Saturated Concrete:</i> After 5 days storage in water > 2.5 N/mm ² (failure in concrete)	(According to ASTM C 882) (According to EN 1542)

System Information

Application Details

Substrate Preparation	Requirements: Sound, clean, free from oil and grease and surface treatments etc. Pre-treatment for good bond: Concrete, mortar, stone should be thoroughly prepared by high pressure water jetting or mechanical means such as grinding, chiselling etc. Cracks must be cleaned to remove dust with compressed air.
------------------------------	--

Application Conditions / Limitations

Substrate Temperature	+10°C min. / +40°C max.
Substrate Moisture Content	Dry condition/ Wet condition

Application Instructions

Mixing	Part A : Part B = 4 : 1 (by weight)
Mixing Time	Pre-batched packaging: Add all of part B to part A. Mix with an electric mixer at slow speed (max. 250 rpm) for at least 3 minutes. Avoid entraining air. Bulk packaging: Add both parts in the correct proportion into a suitable clean, dry container and mix in the same way as for the pre-batched units.
Application Method / Tools	Successful application depends on very careful preparation. The surface to be treated must be structurally sound, free from standing water, oil, grease, surface contaminants. Dirt, dust and other foreign materials must be removed. Concrete which is fully contaminated with oil / grease, must be removed to the depth of sound & uncontaminated concrete. Impregnation of cracks on horizontal slabs: Impregnation is applied with a paint brush or roller until complete saturation of the substrate is achieved. Cracks are sealed by pouring mixed Sika® Injection 451(IN) directly from the mixing vessel between two "dams" made from Sikaflex® sealant. Crack penetrating slabs to their soffit should first be sealed on the underside with Sikadur®-31 epoxy mortar or a suitable cementitious Sika mortar. Injection of cracks on horizontal / vertical slabs: Injection flange / nipples are fixed along the crack line at an approximately 25 cm

center-to-center distance with Sikadur[®]-31. Crack mouth should be opened and sealed with Sikadur[®]-31. Crack penetrating slabs to their soffit should also be sealed on the underside with Sikadur[®]-31 epoxy mortar or a suitable cementitious Sika mortar. Mixed Sika[®] Injection 451(IN) can be injected under pressure through injection ports using injection pump, such as Aliva AL-1200, AL-1250 or the Sika[®] Hand Pump. As soon as injection resin oozes out of the next injection port, the first one is sealed and injection process is continued from next port.

For horizontal crack, injection should start from any of the ends and to be continued and completed till the last port is used. For vertical crack, injection should start from the lowest port and continued upwards.

After completion of the injection process, the injection ports as well as the sealing materials between the ports are removed.

Cleaning of Tools

Clean all tools and application equipment with Sika[®] Colma-Cleaner immediately after use. Hardened / cured material can only be mechanically removed.

Potlife

100g mass (According to FIP 5.1)

Temperature	Time
+30°C	~ 80 min

The potlife is also dependent on the amount of material that has been mixed, higher volumes will decrease the potlife.

Once the pot life has elapsed, the material reacts very quickly with strong exothermic heat development including smoke generation.

Therefore, only mix that amount of material which can be used within the specified pot life.

Notes on Application / Limitations

The injection process is divided into three phases:

Injection:

The time during which the injected material under pressure flows from the pump to the desired moisture/water containing areas.

Induction:

The time from mixing until the reaction starts.

Reaction in dry or damp conditions:

The period during which the mix viscosity increases and the hardening process takes place

Value Base

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

Legal Notes

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

