

# Sika® Injection-451

## Low viscosity Epoxy Injection resin

**Product Description** Sika® Injection-451 is a special solvent free, very low viscous, high strength structural epoxy injection resin.

**Uses** Sika® Injection-451 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

### Tests

**Approval / Standards** Tested and approved according to ZTV-ING (RISS)

### Product Data

#### Form

**Colours** Component A: Yellowish - Transparent      Component B: Brownish

**Packaging** Component A: 0.78 and 13.26 kg      Component B: 0.22 and 3.74 kg

**Storage Conditions / Shelf-Life** 12 months from date of production if stored in unopened, undamaged original and sealed packaging, in dry conditions at temperatures between +5°C and 25°C.

### Technical Data

**Chemical Base** Solvent free, 2-component Epoxy resin

**Density** Component A: ~1.14 kg/l (at 20°C)      Component B: ~0.87 kg/l (at 20°C)

**Viscosity** Of Mixture:  
At +8°C:      ~ 350 mPa·s  
At +15°C:     ~ 180 mPa·s  
At +23°C:     ~ 100 mPa·s  
At +35°C:     ~ 70 mPa·s

**Curing Time** Fully cured: 7 days (at +23°C)



## Mechanical / Physical Properties

<b>Compressive Strength</b>	70 -80 N/mm <sup>2</sup>
<b>Tensile Strength</b>	~50 N/mm <sup>2</sup>
<b>Bond Strength</b>	<i>On Water Saturated Concrete:</i> After 5 days storage in water: 2.6 N/mm <sup>2</sup> (failure in concrete)

## System Information

### Application Conditions/ Limitations

<b>Substrate Preparation</b>	Surfaces and cracks need to be clean, free of loose and friable particles, dust and any other bond-breaking substances. Any dirt must be blown out using clean compressed air.
<b>Substrate Temperature</b>	+8°C min. / +30°C max.
<b>Ambient Temperature</b>	+8°C min. / +30°C max.

### Application Instructions

<b>Mixing Ratio</b>	78 : 22 parts by weight (refer to Application Instructions/Mixing)
---------------------	--

- Mixing**
- The material is supplied in containers pre-batched according to the required mixing ratio of 78 : 22 parts by weight
  - Empty components A and B completely into a mixing vessel and mix until homogeneous.
  - When required, smaller quantities can be measured out and mixed in the correct proportions. The table below illustrates some different mixing ratios that may be convenient.
  - Mix the components together thoroughly but without excessive aeration, using a low-speed mechanical stirrer (max 300 rpm) for at least 3 minutes until a fully homogeneous mixture is obtained. Make sure that the material on the container walls and bottom is also mixed in thoroughly (use a spatula or pour again into another clean container and remix).
  - After mixing, fill the material into the pump's feed container, stir briefly and **use within the pot life**

Partial Unit Mixing Guidelines:

Component A by weight	Component B by weight	Component A + B mixed by weight
0.78 kg	0.22 kg	1.0 kg
3.00 kg	0.85 kg	3.85 kg
5.00 kg	1.41 kg	6.41 kg
8.00 kg	2.26 kg	10.26 kg
10.00 kg	2.82 kg	12.82 kg

<b>Application Method / Tools</b>	Injection pumps for single component products, such as Sika® Injection Pump EL-1, EL-2, Hand-1 or Hand-2.
-----------------------------------	---

<b>Tool maintenance</b>	Removal of fresh remnants from tools and application equipment can be carried out using Sika® Colma immediately after use. Hardened / cured material can only be mechanically removed. Do not leave Sika® Colma in the injection pump.
-------------------------	--

<b>Potlife</b>	(for 1kg)				
		+ 8°C	+ 10°C	+ 20°C	+ 30°C
		~ 90 min	~ 80 min	~ 65 min	~ 10 min
<p>The potlife is also dependent on the amount of material that has been mixed, higher volumes will decrease the potlife.</p> <p>Once the pot life has elapsed, the material reacts very quickly with strong exothermic heat development including smoke generation.</p> <p><b>Therefore, only mix that amount of material which can be used within the specified pot life.</b></p>					
<b>Notes on Application / Limitations</b>	<p>The injection process is divided into three phases:</p> <p><i>Injection:</i> The time during which the injected material under pressure flows from the pump to the desired moisture/water containing areas.</p> <p><i>Induction:</i> The time from mixing until the reaction starts.</p> <p><i>Reaction in dry or damp conditions:</i> The period during which the mix viscosity increases and the hardening process takes place</p>				
<b>Value Base</b>	<p>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.</p>				
<b>Local Restrictions</b>	<p>Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.</p>				
<b>Health and Safety Information</b>	<p>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.</p>				
<b>Legal Notes</b>	<p>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.</p>				



Sika Hellas ABEE  
 Protomagias 15  
 GR 14568 Kryoneri  
 Athens-Greece

Phone +30 210 8160600  
 Telefax +30 210 8160606  
 www.sika.gr  
 sika@gr.sika.com

