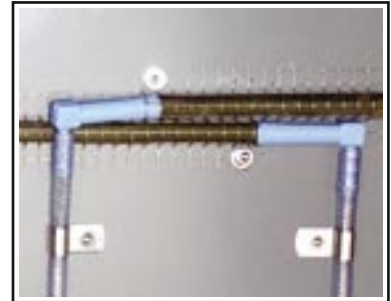


Bentoject® is the combination of a hydrophilic bentonite strip and a post-injectable injection tube into 1 system for the sealing of construction joints in concrete.



### • field of application

- Bentoject® is designed for the secure sealing of construction joints, cold joints and working joints in concrete, where there is a deficiency in the concrete. The product is ideally suited for concrete constructions with limited wall thickness.
- Bentoject® can also be used to replace combinations of 2 and more passive construction joint sealing systems.

### • advantages

- Bentoject® is the combination of two systems into one:
  - a) the preventative element:**
    - Through the expansive outer skin based on bentonite rubber (type Bentorub®+).
    - Swells in contact with water to a maximum of 400%<sup>(\*)</sup> of its original dry volume.
    - Does not dissolve in water and is non-polluting.
  - b) the remedial element:**
    - Through the micro-porous injection tube on the inside (type Infiltra Stop), the system can be injected under low pressure at any chosen time and will work in those places where the contact area was bigger than the total swelling capacity of the bentonite rubber skin, which has therefore led to local leakage (e.g. honeycombing).
    - The injection tube has an open structure over its full length and can be injected with resins & acrylates from De Neef and with micro-fine cements.
- Bentoject® is simple and quick to install in combination with the Bentoject® wire mesh profile.
- Bentoject® can be placed on irregular cold joints and construction joints in combination with Bentostic.
- The composition of the bentonite rubber outer skin avoids premature swelling of Bentoject®.
- The injection of Bentoject® can be performed at any chosen time after installation.
- Concrete will not be damaged due to the installation or the injection of Bentoject®.
- There is no interruption of the building activities when Bentoject® is installed.

• **description**

**Bentoject® is manufactured out of 3 layers:**

- A reinforced spiral of steel wire on the inside prevents the collapse of the tube and hence blockage of the injection channel.
- A filtrating membrane between spiral and outer skin prevents the silting up of the injection channel and the inward swelling of the bentonite rubber.
- A bentonite rubber outer skin. This is the active part of the system and is made out of natural sodium bentonite and synthetic rubber. The outer skin will swell in contact with penetrating water and will thus seal hair line cracks and small voids in the joint.



• **application**

- Bentoject® should preferably be installed on a smooth and dust-free surface. The product can be used under most weather conditions. However, installation during heavy rain or in prolonged contact with water can result in a premature swelling of the strip, which should be avoided.
- Bentoject® can only function properly in a confined space in order to develop sufficient expansion pressure and assure waterproofing, without the necessity for post-injection.
- Bentoject® must, over its full length, always be in direct contact with the construction joint that needs to be sealed. That is why the rolls will be installed by means of the Bentoject® wire mesh profile. This profile must be gun nailed to the surface, minimum one nail every 25 cm (use nails with washers).
- If the surface is very irregular, level the gap between the rolls and the substrate out with Bentostic. No special precautions are to be taken during the preparatory activities (installation of the reinforcement bars, placement of shuttering, ...) in view of the subsequent installation of Bentoject®.
- The rolls are positioned during the installation of the 2<sup>nd</sup> phase reinforcement bars, in between inner and outer rows of tie bars.

**1. Assembly of the system.**

- Bentoject® can be cut to lengths shorter than 5 metres.
- The ends should be prepared by cutting back the bentonite rubber skin by about 4 cm.
- The skin should be tapered at the end for easy installation of the trumpet. The membrane can also be smoothed down with a twist.
- The blue trumpets are then slid over the injection tube until they are securely fixed in place.
- The Bentoject® wire mesh profile should be cut to length with a pair of cutters.

**2. Procedure for the installation.**

**Step 1**

- Remove dust, dirt and loose parts by brushing firmly.

**Step 2**

- Level uneven and irregular surfaces with Bentostic.

**Step 3**

- Unroll the Bentoject® (a concrete cover of 7 cm at all sides should always be respected). The roll ends should have a lateral overlapping of 5 to 10 cm (cfr. fig.3). The green ends need to be pressed together as well as possible.

- In order to be able to inject at a later stage, the PVC ends have to protrude out of the concrete at well accessible spots. The green part of the Bentoject® tube may not protrude out of the concrete.

**Step 4**

- Place the wire mesh profile over the Bentoject®.

**Step 5**

- Fix the system by hammering or gun nailing (use nails with washer, approx. 4 per metre).

**3. Injection.**

- When water is infiltrating through the joint, De Neef injection grouts or micro-fine cements are injected through the injection ports which protrude from the concrete.
- Preferably the injection will be done after curing and initial shrinkage of the concrete. This way the joint is sealed.
- The injection fluid (e.g. HA Flex LV) is a very thin liquid injection resin, which remains elastic after polymerisation, is not corrosive for the reinforcing bars and is environmentally friendly.
- For permanent injections, use HA Flex LV. The maximum injection pressure is 14 bars (when the length of the tube is too long, the pressure of injection at the entry side is too high and can damage the concrete).

• **technical data/properties**

Property of the outer skin	Value	Norm
Swelling capacity in contact with water	Swells up to max. 400% of its original dry volume <sup>(*)</sup>	Test report KUL University
Density	Approx. 1,48 kg/dm <sup>3</sup>	ASTM D71-84
Weight	Approx. 0,125 kg/m	Test DNC
Expansion pressure under complete enclosure	≥ 0,70 N/mm <sup>2</sup>	Test report KUL University
Resistance against hydrostatic pressure	Up to 50 metres of water column = 5 bars	Test DNC
Installation temperatures	-15°C to 60°C	Test DNC
Operating temperatures	-45°C to 120°C	Test DNC
Property of the injection tube		
Consumption during injection	Minimum 190 g/m to fill the tube	
Steel wire tensile strength	Approx. 1800 N/mm <sup>2</sup>	

• **appearance**

Diametre of Bentoject® : Ø approx. 16 mm  
 Outer diametre of the spiral : Ø approx. 8 mm  
 Thickness of bentonite skin : approx. 4 mm

• **consumption**

The necessary quantities are dependent on the lengths of the various (construction) joints, which need to be sealed. It has to be taken into consideration that a lateral overlapping of 5 to 10 cm between the green parts of 2 lengths of Bentoject® is necessary (cfr. fig.3). The consumption of resin is dependent on the hollow voids around the Bentoject®, which need to be filled.

• packaging

**Bentoject® is supplied in 2 packs.**

**Bentoject® rolls in a cardboard box containing the complete kit:  
i.e.**

- 8 rolls of 5 metres = 40 metres.
    - + reinforced PVC-tube°: 4 metres + 16 caps°.
    - + blue trumpets°: 16 pieces.
    - + anchoring clips°: 16 pieces.
- (° can also be ordered separately.)

**Bentoject® wire mesh in a pack containing 40 x 1 metre.**

- mesh grid: 10,6 by 10,6 mm.
- diameter of the steel wire: 0,90 mm.

**1 pallet = 24 x 40 metres = 960 metres.**

**Weight:**

- Bentoject® in cardboard box.
  - 13 kg/kit of 40 metres gross.
  - 11 kg/kit of 40 metres net.
- Bentoject® wire mesh profile.
  - 1,4 kg/kit of 40 metres gross.
  - 1,3 kg/kit of 40 metres net.

• storage

Bentoject® should be stored under cover, clear of the ground. Protect the materials from all sources of moisture and frost. Shelf life is unlimited.

• accessories

**To be ordered separately.**

**Bentostic.**

- Mastic for levelling the surface.
- Green colour.
- Packaging: plastic pails of 5 kg.

• health & safety

For full information consult the relevant Material Safety Data Sheet.

(\*) Tested under laboratory conditions.