

Bentorub® +

Hydrophilic bentonite strip for the sealing of construction joints in concrete.



• field of application

- Bentorub®+ is designed for sealing construction joints, cold joints and working joints in concrete, around pipe penetrations, in sewer joints, against slurry walls, sheet piling, etc.
- Can be used in combination with Infiltra Stop in situations, which are deemed to be high risk.

• advantages

- Bentorub®+ is a permanently active system, which swells up to approximately 400% of its original dry volume^(*).
- Bentorub®+ is an ecological and user friendly system: simple and quick to install by means of gun nailing or glueing. The use of Bentosteel will help the installation and will protect the Bentorub®+ strip against damage during pouring or compaction of the concrete.
- The composition of Bentorub®+ prevents premature swelling.
- Bentorub®+ has a proven track record in water treatment plants, water purification plants, underground parking lots, water reservoirs, swimming pools, water tanks, metro works and other concrete structures subject to high water pressure.
- Bentorub®+ can resist hydrostatic pressures of up to 80 metres of water column = 8 bar.
- The durability and performance of the Bentorub®+ will exceed the design life of the structure (bentonite is a product of nature).
- The highly elastic and plastic properties of Bentorub®+ will easily counter-balance the initial concrete shrinkage of the structure.
- Bentorub®+ can fill small honeycombs.
- Bentorub®+ will not dissolve in water and is non-polluting.

• description

- Bentorub®+ is a green flexible hydrophilic strip of approx. 25 by 20 mm, made of natural sodium bentonite clay and synthetic rubber.
- It comes in lengths of approx. 5 metres.
- Due to the shrinkage of the drying concrete, small cracks and voids will appear in the construction and cold joints, through which water can penetrate.
- In contact with water, Bentorub®+ will swell to approximately 400% of its original volume^(*). The expansive clay mass will thus seal these hair line cracks and voids in the joint.
- The first expansion is retarded to prevent the strip from reacting too soon with possible rainwater, before or during the installation.

• **application**

- Bentorub[®]+ is preferably applied onto a smooth and dust-free concrete surface. Bentorub[®]+ can be used under most weather conditions.
- Installation during heavy rain or in prolonged contact with water can result in a premature swelling of the strip, which should be avoided.
- No special precautions should be taken during the preparatory activities (installation of the reinforcement bars, placement of shuttering, etc) in view of the subsequent installation of bentonite strip.
- The Bentorub[®]+ is applied during the installation of the 2nd phase reinforcement bars, in between inner and outer rows of reinforcing bars.

Procedure for the installation of Bentorub[®]+

Step 1

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

Application by means of gluing with Bentoglu (horizontal and horizontal hanging applications)

Step 2

- Apply Bentoglu to the surface exerting pressure while caulking in order to obtain a good contact with the surface. Apply a bead of approx. 5x10 mm.

Step 3

- Unroll the Bentorub[®]+ strip and press firmly into the glue. Wait until the glue is dry before pouring concrete (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. The ends need to be pressed firmly together.

Application by means of gun nailing with or without Bentosteel

Step 2

- Level uneven and irregular surfaces with Bentostic or Swellseal Mastic.

Step 3

- Unroll the Bentorub[®]+ strip (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. The ends need to be pressed firmly together.

Step 4

- In case of application with the Bentosteel wire mesh (preferred), install the Bentosteel wire mesh over the Bentorub[®]+ strip. Gun nailing without Bentosteel is only possible in horizontal applications, in vertical or hanging applications the use of Bentosteel is required.

Step 5

- Fix the system by nailing or gun nailing (use nails with washer, approx. 4 per metre).
- Bentorub[®]+ can be fixed around pipe penetrations with steel wire or Bentoglu.

• **technical data/properties**

| Property | Value | Norm |
|---|---|----------------------------|
| Swelling capacity in contact with water | Swells approx. 400% of its original dry volume ^(*) . | Test report KUL University |
| Density | Approx. 1,44 kg/dm ³ | ASTM D71-84 |
| Weight | Approx. 0,72 kg/m | Test DNC |
| Cone penetration | 35,5 | ASTM D217 |
| Expansion pressure under complete enclosure | ≥ 0,70 N/mm ² | Test report KUL University |
| Resistance against hydrostatic pressure | Up to 80 m water column = 8 bars | Test report DNC |
| Elongation at rupture | 7500% | Test method KUL University |
| Maximum bend allowed | No cracks at 180° above 0°C | Test method KUL University |
| Installation temperatures | -15°C to 60°C | Test DNC |
| Operating temperatures | -45°C to 120°C | Test DNC |
| Odour | Odourless | |

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|---------------------------------|--|
| • | <ul style="list-style-type: none"> • The swelling properties are created by the particle structure of the clay. • Bentorub[®]+ can only function properly in a confined space in order to develop sufficient expansion pressure and assure waterproofing. • The expansion of Bentorub[®]+ will create a certain pressure, which needs to be counteracted by at least 7 cm of concrete coverage at both sides (installation in the middle of the joint is preferred). • The durability and performance of the Bentorub[®]+ system are superior to the life expectancy of the construction, since it is composed out of inert rubber and clay, a natural product aged millions of years. • For special applications, such as contact with strongly polluted water or chemicals, it is recommended to consult the De Neef representative. For contact with salt water, use Bentorub[®] Salt. |
| • appearance | Green, rectangular plastic strip of approx. 20 by 25 mm, in rolls of approx. 5 metres length. |
| • consumption | The necessary quantities depend on the length 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 2 lengths of Bentorub [®] + is necessary. |
| • packaging | <p>Cardboard boxes containing 30 metres of strip: 6 rolls of approx. 5 m length.</p> <p>Weight per cardboard box: approx. 21,6 kg net/approx. 23 kg gross.</p> <p>A full pallet contains 24 cardboard boxes of 30 m = 720 m.</p> |
| • storage | <p>Bentorub[®]+ should be stored under cover, clear of the ground. Protect the materials from all sources of moisture and frost.</p> <p>Storage temperature must be between 5°C and 30°C.</p> <p>Shelf life is unlimited.</p> |
| • certificates/approvals | Socotec - France. |
| • accessories | <p><u>To be ordered separately</u></p> <p><i>Bentosteel</i></p> <ul style="list-style-type: none"> • Steel wire mesh profile for Bentorub[®]+ • Mesh grid: 10,6 by 10,6 mm. Section: 25,5 mm by 9 mm. • Length: 1 metre. • Packaging: 30 x 1 metre. <p><i>Bentostic</i></p> <ul style="list-style-type: none"> • Mastic for levelling the surface. • Green colour. • Packaging: plastic pails 5 kg. |
| • health & safety | <p>For full information consult the relevant Material Safety Data Sheet.</p> <p>^(*) Tested under laboratory conditions.</p> |

All data mentioned on this technical data sheet are product descriptions. They are the result of general experience and experiments and don't take any specific application into account. No further demands may be derived from these data. The manufacturer has the privilege to implement technical changes, which result from new research concerning the material composition and form. To verify that you are holding the latest version of this Technical Data Sheet, please visit www.deneef.eu.

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