

# BPA-CEMTOBENT® CS PLUS (COMBISEAL)

## BENTONITE WATERPROOFING LINER

**BPA-CEMto bent CS-Plus double-sealing bentonite liner equipped with root protection and radon-seal**

### PRODUCT DESCRIPTION

BPA-CEMto bent® CS Plus system is a unique bentonite membrane especially designed for structural waterproofing. BPA-CEMto bent® CS Plus can be used for the sealing and protection of reinforced concrete in underground structures and tunnels. BPA-CEMto bent® CS Plus consists of three complementary components:

- ☞ a geo-composite clay liner
- ☞ a polyethylene honeycomb liner where the sodium bentonite powder is held
- ☞ a rain protection fleece and a strong polyethylene coated geotextile (root-resistant and radon tight)



### APPLICATION AREAS

BPA-CEMto bent® CS Plus can be used for the sealing and protection of reinforced concrete in underground structures and tunnels. It can be used for both vertical and horizontal applications.

### HOW DOES BPA-CEMTOBENT® CS PLUS WORK?

The sealing process of the bentonite lining system is activated immediately by penetrating water causing a controlled swelling of the bentonite clay within the matrix forming a dense, impermeable waterproofing membrane. Even if the primary sealing, the 3D-PE-Sheet, is damaged, the exposed bentonite reacts with the incoming water creating an extremely tight and strong, gel-like film, which seals the concrete structure (secondary sealing) and stops any water circulation between the membrane and the concrete. Even shrinkage cracks are reliably sealed and overbridged.

### CHARACTERISTICS AND ADVANTAGES

- ☞ Higher puncture and tear resistance compared to conventional foils and coatings
- ☞ High compound shear strength
- ☞ Can be installed in every season independently of temperature and weather conditions
- ☞ Quick and easy to install without complicated welding equipment
- ☞ Demonstrates self-healing properties
- ☞ Seals small cracks in the concrete
- ☞ Root resistant and certified as radon-tight
- ☞ More than 500% swelling volume
- ☞ May be pre-applied or post-applied
- ☞ Quality control tests to ensure consistent high quality

### CERTIFICATION

- ☞ CE-Marking
- ☞ Root resistance and radon tightness
- ☞ Clearance Certificate of environmental soundness



**PRODUCT DATA**

	Bentonite Waterproofing Liner BPA-CEMto bent® CS (CombiSeal)	Article-No.
<b>Dimensions/ Packaging</b>	1,80x30 m; Roll in black foil; Ø ca. 60 cm; approx. 300 kg/roll	20-100
	3,60x30 m; Roll in black foil; Ø ca. 60 cm; approx. 600 kg/roll	20-101
	1,20x30 m; Roll in black foil; Ø ca. 60 cm; approx. 200 kg/roll	20-102
<b>Storage</b>	BPA-CEMto bent® CS (CombiSeal) should be stored off the ground in dry conditions.	

**TECHNICAL DATA**

Technical Data	Test Method (based on)	Unit	Value
Mass per unit area, total	DIN EN 965	g/m <sup>2</sup>	5.500
Mass per unit area, non-woven extra light <i>(PP white, filled with bentonite)</i>	DIN EN 965	g/m <sup>2</sup>	60
Mass per unit area, honeycomb <i>(PE-3-D-Composite, filled with bentonite)</i>	DIN EN 965	g/m <sup>2</sup>	70
Mass per unit area, bentonite layer <i>(sodium bentonite, powder)</i>	DIN EN 965	g/m <sup>2</sup>	5.000
Mass per unit area, carrier woven <i>(PP-slit film woven, beige)</i>	DIN EN 965	g/m <sup>2</sup>	120
Mass per unit area, top layer woven <i>(PE-coated woven, black)</i>	DIN EN 965	g/m <sup>2</sup>	200
Thickness, total	DIN EN 964-1	mm	≥ 8
Max. tensile strength, md / cmd*	DIN EN ISO 10319 ASTM-D-4595	kN/m	30 / 25
k-value	DIN EN ISO 18130 ASTM-D-5887	m/s	2 x 10 <sup>-15</sup>

\*md= machine direction, cmd= cross machine direction



Bentonite Properties	Test Method (based on)	Unit	Value
Montmorillonite content	XRD	%	≥70
Methylene blue consumption	Methylene blue test, VDG P 69	mg/g	≥200
Water content	DIN 18121 (5h, 105°C)	%	≤15
Water absorption	DIN 18132 (24 h)	%	≥500
Swell index	ASTM-D-5890	ml/2g	≥20
Fluid loss	ASTM-D-5891	ml	<20

## ADDITIONAL INFORMATION

### Surface:

Bentonite waterproofing liner BPA-CEMto bent® CS should be placed on a properly prepared flat surface that is free from voids > 20mm and free from construction debris.

Cracks > 1 mm and/or offsets > 1 mm should be sealed with BPA-CEMtopaste® before installing the bentonite waterproofing liner.

### Methods of the sealing of overlappings

- 🔗 Overlap edges of the membrane by 15 cm and detail overlaps using BPA-Bentonite Powder.
- 🔗 Overlap edges of the membrane by 15 cm and seal with BPA-SealTape.
- 🔗 Overlap edges of the membrane by 15 cm and seal with BPA-CEM 805 Adhesive.
- 🔗 Overlap edges of the membrane by 15 cm and seal with BPA-CEMtopaste bentonite paste.
- 🔗 In addition to the above nail fixings may be used to secure the overlaps if required

### Preparation and general advice

Surrounding air temperature: minimum -5°C

The above mentioned temperatures constitute the generally valid area in which no additional measures need to be taken during application.



### **Environment and health**

This product does not represent a hazardous substance within the meaning of the EU Hazardous Substances Regulation. A safety data sheet for transport, placing on the market and use is available on the request.

### **Dangers and Safety**

The essential safety, toxicological, physical and ecological data for the handling of BPA-CEMto bent® CS can be taken from the product-specific safety data sheets.

### **Data**

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.

### **Legal advice**

All above mentioned Information concerning BPA-products, especially any recommendations and advices relating to the application and use of BPA products are given in good faith based on BPA's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with BPA's recommendations.

In practice, the differences in materials, actual site conditions and other factors outside are such that no warranty 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 before proceeding with the full application of the products. BPA reserves the right to change the properties of its products without notice.

Users must always refer to the most recent issue of the Product Data Sheet for the product concerned, copies of which will be supplied on request. All sales of BPA are subject to our current terms and conditions.

### **Local Restrictions**

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.

