

M F P A Leipzig GmbH

Recognised Test Office for Construction Materials, Components and Types

Test, Monitoring and Certification (PÜZ) Office according to the State Building Code (SAC 02), Building Product Law (NB 0800)



Test laboratory accredited by DAP GmbH according to DIN EN ISO/IEC 17025.
The accreditation applies to the test methods listed in the certificate.

DAP-PL-4077.99



Business division V - Civil and underground engineering

Head of Business division: Prof. Dr.-Ing. Olaf Selle
Work Group: Building Structure Sealing

General Building Supervisory Test Certificate

Test certificate number:

P-SAC 02 / 5.1 / 11 - 271

Object:

PC® BENTOSTRIP T 19 x 25 (Dim.: 20 x 25)
swellable joint tape based upon bentonite for inside sealing of working joints in building components made of concrete with high water penetration resistance as per building regulations list A, part 2, consecutive no. 1.4

Applicant:

TRADECC NV
Terbekehofdreef 50-52
B – 2610 Wilrijk

Initial issue:

06/05/2008

Applies to:

05/05/2013

The above mentioned object can be used as defined by the State Building Codes on the basis of this general building supervisory test certificate.

This general building supervisory test certificate includes 7 pages and 1 annex.

-This translation of the original German version not checked by MFPALeipzig-

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1 Object and area of application

1.1 Object

The general building supervisory test certificate applies to manufacturing and using the swellable natural clay joint tape based upon sodium-bentonite with the admixture of India rubber with the product name *PC[®] BENTOSTRIP T 19 x 25 (Dim.: 20 x 25)* from the company TRADECC NV as joint sealing in conformity with the building regulations list A, part 2, consecutive no.1.4, edition 2007/2: „Normally Inflammable Joint Seals for Building Components Made of Concrete with High Water Penetration Resistance against Pressurising and Non-Pressurising and Soil Moisture“ (Normalentflammbare Fugenabdichtungen für Bauteile aus Beton mit hohem Wassereindringwiderstand gegen drückendes und nicht drückendes Wasser und gegen Bodenfeuchtigkeit). In a dry state, the joint tape has a rectangular cross-section with a width of 25 mm and a thickness of approx. 20 mm; it has a black colouring.

1.2 Area of application

- (1) The swelling section *PC[®] BENTOSTRIP T 19 x 25 (Dim.: 20 x 25)* may be used for sealing working joints in concrete and reinforced concrete construction to protect against:

Moisture in the soil and against

Non-pressurising and pressurising water up to a maximum water pressure of 2 bar (20 m water column)

This system is suited for alternate water zones¹⁾. The seal satisfies the requirements of utilisation class A for the loading classes 1 and 2 in conformity with the WU guideline¹⁾.

- (2) Use is dependent on adherence to the processing guidelines issued by the aforementioned manufacturer. The material must only be processed in a dry state under dry weather conditions. The aforementioned geometry must not be changed. It must be fastened permanently on the even and dry subgrade, free of any loose parts, using the fixing grids offered by the manufacturer; fastening must be done in such a way that the position cannot be changed when concreting. The spacing between the fastening equipment of the fixing grids on the concrete subgrade must not exceed 25 cm in the longitudinal direction of the joint tape. In this context, a minimum edge distance of 10 cm must be guaranteed.

¹⁾ DAfStb guideline: Waterproof structures made of concrete (WU-Richtlinie: Wasserundurchlässige Bauwerke aus Beton), edition of November 2003

In order to guarantee the proper functions of the swelling tape, increase in volume must be restricted by complete embedding in concrete so that a swelling pressure can build up. The details provided by the applicant concerning the instructions for installation (Annex 1) are binding in terms of subgrade, preparation of the subgrade and the method of installation.

2 Determinations for the structural product

2.1 Properties and composition

- (1) The manufacturer stated that the rectangular swelling joint tape *PC[®] BENTOSTRIP T 19 x 25* (Dim.: 20 x 25) consists of natural sodium-bentonite and non-vulcanized India rubber. In a non-swollen state, the swelling joint tape has the following characteristics:

Colour:	black, talcumed
Density:	1.521 g/cm ³ at T = 23°C
Dimensions:	rectangular profile, 25 mm broad, 20 mm thick
weight per meter:	0.702 kg/m

- (2) The swelling tape increases in mass by max. 240 % based on its original mass, when immersed in neutral water. This process is reversible; this means that the material returns to its original mass once it has dried. When immersed in liquids that strongly attack concrete in accordance with DIN 4030, the mass of the swelling tape rises continually and reaches a maximum value of 120 %, whereas the maximum mass increase in alkali liquids is 220 %.

A swelling pressure builds up if the swelling tape is prevented from increasing in volume when installed. The magnitude of the produced swelling pressure is dependent on the conditions of installation and on the effects of liquids. The force built up as a result of the swelling process can reach maximum values of 30.5 kN/m (or a swelling pressure of 12 bar).

The swelling tape preserves its functional capacity even in the event of alternate drying and renewed exposure to water. The functional capacity proven in the sealing test at 5 bar water pressure, even after 3 alternate exposures to water, confirms that the swelling joint tape can be used under practical circumstances with a permanent water pressure of up to 2 bar, taking into consideration a safety factor of 2.5. The swelling joint

tape is normally inflammable in accordance with DIN 4102, part 1 (05/1998). It does not drop off burning in the meaning of this standard.

- (3) The described properties (2) were proven in extensive tests on the short-term and long-term behaviour under unrestricted swelling in different liquids as well as in a sealing test with alternate exposure, swelling pressure tests and in a combustion behaviour test. There are thermograms and density determinations for the identification of the tested product. Proof of its suitability for use was provided in accordance with the test principles for the issue of a general building supervisory test certificate for joint sealing, valid version of September 2002. The description of the tests and an extensive presentation of the results are contained in test report no. P 2.2 / 11 - 271 dated 05/05/2003. *PC® BENTOSTRIP T 19 x 25 (Dim.: 20 x 25)* must correspond with the material analysed in the suitability test for use. It must possess the technical ratings specified in the test report.

2.2 Manufacturing, packaging, transport, storage and labelling

- (1) The primary product for the swelling tape is manufactured in a plant which is made known to the test office. Packaging of the product takes place in the applicant's plant. Changes in the formulation and a switch in supply plant must be notified immediately to the test office.
- (2) Packaging, transport and storage must take place in such a way that *PC® BENTOSTRIP T 19 x 25 (Dim.: 20 x 25)* does not come into contact with water, is not exposed to high humidity levels or is protected against the effects of UV radiation. The packaging must be labelled with this instruction. Joint tapes that are already swollen must not be installed.
- (3) The details listed on the packaging concerning requirements specified in other areas of law must be adhered to.
- (4) The manufacturer's details concerning the duration of storage must be adhered to. System parts that belong together must be clearly labelled and sold together. The product delivery slips must be labelled with the conformity symbol (Ü-symbol), as specified according to the state conformity ordinances. Labelling may only take place if the requirements defined in section 3, proof of conformity, have been fulfilled.



3 Proof of conformity

(1) General points

In accordance with the building regulations list A, part 2, chapter 1, no. 1.4, the conformity of the construction product with the requirements of this general building supervisory test certificate is indicated by a declaration of conformity on the part of the manufacturer on the basis of an in-house production control (WPK) and an audit of the construction product before confirmation of the conformity (first test - EP), carried out by a test office that is recognised under building inspectorate laws (ÜHP).

(2) First test of the building product by a recognised test office

The first test is not necessary since the samples for the usability certification tests were taken from the manufacturing facility's production.

(3) In-house production control

The manufacturer is required to maintain an in-house production control in accordance with DIN 18200:2000-5. This requires constant monitoring of the production in order to ensure that the manufactured products correspond with the requirements of the general building supervisory test certificate. In-house production control includes the tests described below. The adherence to the properties defined in Section 2.1 with maximum permissible deviations of 10 % must be checked in each production plant as follows:

for each batch or

at least once a quarter:

increase in mass in the event of unrestricted swelling in neutral water on 3 test specimens ($l = 15 \text{ cm}$) over a period of 7 days, weight per meter

according to scope of delivery:

raw material test - for each supplied batch on the basis of plant test certificates from the suppliers, visual control

The aforementioned test criteria must be adhered to. The results of the in-house production control must be recorded and evaluated. The records must be kept for at least 5 years and submitted to the test office on request.



4 Conformity symbol

(1) The manufacturer has to label the construction product with the conformity symbol (Ü-symbol) according to the state conformity symbol ordinances. The Ü-symbol should be placed on the packaging or, if this is not possible, on the instruction leaflet with the information specified there:

- the production plant and
- the number of the general building supervisory test certificate

It may only be labelled if it meets the conditions called for in Section 3.

(2) The following details must be on the packaging of the construction product or on the instruction leaflet:

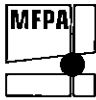
- product name
- batch number
- purpose of use
- reference to the corresponding processing regulation

5 Legal basis

This general building supervisory test certificate is issued on the basis of § 21a of the Saxon Building Code (SächsBO) in the version dated 18/03/1999 in connection with the Building Regulations List A, part 2, chapter 1, consecutive no. 1.4, edition of 2007/2.

6 Rights of recourse


An appeal can be lodged against this general building supervisory test certificate within one month of receipt thereof. The appeal must be lodged in writing or dictated to the managing director of *Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig mbH*, Hans - Weigel - Straße 2 b, 04319 Leipzig.

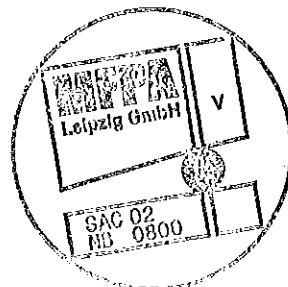


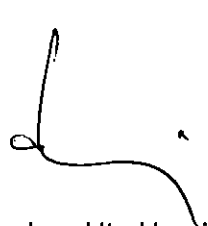
7 General instructions

- (1) This general building supervisory test certificate confirms the suitability for use of the structural product listed as object in the meaning of the State Building Code.
- (2) This general building supervisory test certificate does not replace the statutory licenses, permissions and certifications required for the implementation of a building project.
- (3) This general building supervisory test certificate is issued without prejudice to the rights of third parties, in particular private proprietary rights.
- (4) Without prejudice to additional regulations, the manufacturer or distributor of the structural product must provide the structural product user with copies of the general building supervisory test certificate and must make reference to the fact that the general building supervisory test certificate must be available at the place of use.
- (5) The technical data sheet provided by the manufacturer has been reviewed by the test office in terms of plausibility.
- (6) This general building supervisory test certificate must only be copied in its entirety. Publication of excerpts requires the approval of *Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig (MFWA Leipzig)*. Texts and diagrams of advertising material must not contradict this general building supervisory test certificate. Translations of this general building supervisory test certificate must contain the reference "This translation of the original German version was not reviewed by MFWA Leipzig".
- (7) This general building supervisory test certificate is issued revocably. The provisions can be supplemented and changed retrospectively, in particular when necessitated by new technical insight.

Leipzig, 06 May 2008


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Managing Director




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PC[®] Bentostrip swelling profile T 19 x 25 (Dim.: 20 mm x 25 mm)

PC[®] BENTOSTRIP profiles are seals swellable in water for construction joints of concrete buildings. They consists of ground highly swellable clay mineral (sodium bentonite), embedded in a matrix of non-vulcanized rubber as binding agent.

Installed in concrete construction joints, these profiles swell upon contact with water and seal the joint gap permanently. Due to the high swelling pressure of the bentonite, the swelling compound also intrudes into damaged spots (rock pockets, cracks) and closes such leakage as well.

Bentonite swelling profiles have been successfully used in building practice for years. The PC[®] BENTOSTRIP grades mean a technological optimization of these products.

Application:

Typical applications of PC[®] BENTOSTRIP are the sealing of construction and connection joints of concrete buildings in the foundation and groundwater area, furthermore all kinds of penetrations of the building structures in areas that are to be permanently sealed against water.

Installation of the swelling profiles is easy, fast and cost-efficient and they are reliable and permanently impermeable – even in case of high water pressure! The dreaded faults and damage of conventional construction are prevented. Leakage due to lateral infiltration and poorly compacted concrete in the joint area does not occur.

Installation:

PC[®] BENTOSTRIP profiles are always installed centrally in the joint inside the reinforcement. A sufficient concrete cover must be ensured, otherwise the high swelling pressure of the bentonite might cause damage to the concrete. Connections are butt jointed and joined homogeneously by slight beating or compression. Bigger joints are efficiently and easily filled with a bentonite mastic paste. The swelling tapes are stuck in using a swelling tape adhesive or fixed mechanically by nailing or use of a wide meshed, U-shaped grid.

The concrete surface must be clean. In case of high surface roughness or unevenness the use of a bentonite mastic is advisable. The profiles can then be laid into the moist mastic, thus ensuring a perfect form closure.

The standard cartridges the product is filled in enable the easy application of a bentonite bead of any thickness which perfectly levels out any unevenness.

Safety:

PC[®] BENTOSTRIP swelling profiles are non-hazardous materials and handling and processing are absolutely easy. According to our state of knowledge they do not contain any substances that might pollute the groundwater or be detrimental to health, cause allergies etc.

Nevertheless, we recommend to ensure adequate hygiene in processing and always to wash one's hands before eating etc.

In case of fire the binding agents contained in PC[®] BENTOSTRIP may cause low temperature carbonization gases which are detrimental to health and flammable. However, the material is self-extinguishing and will burn only if an external flame is applied continuously

Storage:

PC[®] BENTOSTRIP swelling profiles must be stored in a dry place and protected from excessive heat. Installation in winter at low temperatures is facilitated if the profiles are stored in a temperate place and are not exposed to the cold until right before installation.

Technical data:

Product:	swelling profile for connection joints in concrete
Swelling substance:	aluminium laminated silicate (montmorrillonite)
Proportion:	approx. 50 %
Binding agent:	elastomers, not cross-linked
Swelling volume:	370 % (Starting volume of 100 %)

This technical information is based on our current state of knowledge about PC[®] BENTOSTRIP bentonite swelling tape. It is aimed at potential users only. Since we do not know the relevant applications and processing conditions, it is the user's responsibility to carefully check the product's suitability for the intended use. Tradecce does not intend to trespass upon somebody else's rights with this information.

