

General Building Code Test Certificate

- Translation -

Test Certificate No.: P-5196/307/09 MPA-BS

Test item: Swellable INDU-FLEX-CJ13 joint sealing tape together with installation adhesive for swellable tapes

Intended use: Sealing tape for construction joints in in-situ concrete structures (normal-flammability joint sealant for concrete members with a high water penetration resistance against pressing and non-pressing water and against ground moisture in compliance with Bauregelliste A, Part 2, No. 1.4)

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Aquafinstraße 2-8
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Issued on: 09/03/2010
Valid until: 08/03/2015



Provided the conditions of this General Building Code Test Certificate are met, the above test item can be used as defined by Federal State Building Codes.

This General Building Code Test Certificate (abP) covers 5 pages and 5 annexes.

This document is the translated version of General Building Code Test Certificate (ABP) No. P-5196/307/09 MPA-BS dated 09/03/2010. The legally binding text is the aforementioned ABP.

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Notified body (0761-CPD)
MPA Braunschweig has been approved and notified as a civil engineering supervisory, inspection and certification body. MPA Braunschweig has been ISO/IEC17025 accredited as a testing and calibration laboratory and ISO/IEC17020 accredited as an inspection body

1 Test item and field of application

1.1 Test item

The INDU-FLEX-CJ13 joint sealing tape is a swellable tape that is based on a thermoplastic elastomer. The swellable tape is produced in rectangles of 20mm x 5mm (width x height). It is applied to the hardened concrete with installation adhesive.

1.2 Field of application

The normal-flammability swellable tape corresponds to Bauregelliste A, Part 2, No. 1.4 (as amended). It is used to seal construction joints in in-situ concrete structures with a high water penetration resistance against pressing and non-pressing water and against ground moisture. The swellable tape may be installed up to a water pressure of 0.8 bar (corresponding to an immersion depth of 8m) in in-situ concrete structures.

The sealing system can be used in zones of frequently changing water levels. It complies with the utilization-class A requirements for stress classes 1 and 2 as set forth in the regulations for watertight structures (WU-Richtlinie) ¹.

The swellable tape must be applied as specified in section 2.3 (product details). The sealing properties of the tape are based on its ability to swell.

2 Requirements made on the sealing tape and the adhesive

2.1 Properties and characteristic values

The building products have the characteristic values shown in annexes 1 to 3, and they must be in conformity with these characteristic values.

The fitness for use of the swellable tape together with the installation adhesive was demonstrated in tests performed on the premises of the Materials Testing Institute (MPA) in Braunschweig (see Assessment Report No. 5196/307/09 of 09/03/2010). The test programme complied with the test principles for certification with General Building Code Test Certificates (abZ) for joint sealants used for concrete members with a high water penetration resistance against pressing and non-pressing water and against ground moisture (status: May 2008).

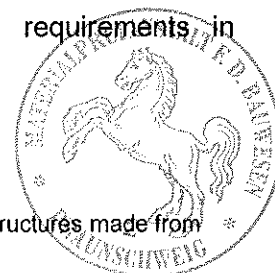
Construction joints that are sealed with the swellable tape

- provide adequate stability
- provide adequate adhesive strength
- are impervious to water
- provide adequate age resistance

for the field of application mentioned in section 1.2 above.

The reaction to fire of the swellable tape conforms with the class-E requirements in DIN EN 13501-1.

¹ German committee for RC directive "Wasserundurchlässige Bauwerke aus Beton" (watertight structures made from concrete), November 2003



2.2. Packaging, transport, storage and identification

The swellable tape will be packed in boxes containing rolls of 25 metres each. The adhesive comes in 300-millilitre cartridges. The product has to be handled and stored in such a way that the swellable tape and adhesive are not adversely affected in their intended properties. The materials have to be protected against the action of frost and atmospheric influence.

The building products (packaging) shall be marked to show product name, conformity mark (see section 4 below), name of manufacturer, date when produced, marking in compliance with the Ordinance on Hazardous Substances (GefStoffV), if required, as well as the batch number.

2.3 Product details

The manufacturer's product details are shown in annexes 4 and 5 and must be complied with. The specifications made have been checked for compliance with the results of the initial type test and for plausibility.

In the joint region, the concrete surface must be dry to moist (without a glossy water film), clean, and it must have been freed from dust, loose material and release agents. The swellable tape must always be glued to the concrete surface with the installation adhesive. It has to be checked for perfect fit just before casting the concrete.

3 Declaration of conformity

3.1 General

Confirmation that the above swellable INDU-FLEX-CJ13 tape and the "Montagekleber" installation adhesive are in conformity with the requirements set forth in the present General Building Code Test Certificate shall be provided for each production plant in the form of a manufacturer's conformity declaration. This declaration shall be issued on the basis of factory production control (FPC) and on the basis of an initial type test for the product performed by an approved inspection body.

3.2 Initial type test of the building product performed by an approved inspection body

An initial type test is not required, because the samples used for testing were taken from the production process in the production plants as part of fitness-for-use attestation. If the conditions under which the product is manufactured should change, an initial type test must be made by an inspection body approved by construction supervisory authorities.

For initial type testing, the characteristic values must be verified on the basis of table 1. The obtained values must not differ from reference values by more than the tolerances shown in that table.

3.3 Factory production control (FPC)

A factory production control programme shall be established for, and factory production control shall be performed in, each production plant in compliance with DIN 18200. Factory production control means continuous supervision of production which the manufacturer must perform to ensure that the building products manufactured by him comply with the regulations of this General Building Code Test Certificate.



Factory production control shall be performed in compliance with the specifications shown in table 1, which reflect the special features of the products and the conditions for producing these products. The requirements made are based on the results of the initial test.

The results of factory production control shall be recorded and evaluated by the manufacturer. The records shall include the following details as a minimum:

- Name of the product
- Type of test or inspection
- Date when produced and date of test
- Test results and comparison with requirements
- Signature of person in charge of factory production control

The records shall be kept for a minimum of five years and shall be presented upon request.

Should testing supply inadequate results, the manufacturer shall take immediate action to remedy any deficiencies noted. Non-conforming building products shall be handled so that confusion with conforming and faultless building products is positively prevented. Once the deficiency has been corrected, the required test shall be repeated to an extent necessary to prove adequate correction.

Table 1: Type and frequency of tests to be performed as part of factory production control

Properties	Test conditions	Requirements	Frequency
Swellable INDU-FLEX-CJ13 joint tape			
Inspection of source materials	Manufacturer's declaration or suitable tests	No signs of change	Per shipment lot
Height	-	5.2mm ± 5%	Per lot
Width	-	21.4mm ± 5 %	
Weight	-	122 g/m ± 3%	Per lot
Swelling capacity (gain in weight)	Stored for 8 days in (demin.) water	1040 wt % ± 10%	Per lot
Reference samples			Per lot
Installation adhesive			
Inspection of source materials	Manufacturer's declaration or suitable tests	No signs of change	Per shipment lot
Density	cf. Annex 2	0.97 g/cm ³ ± 3%	Per lot
Infrared spectrum	cf. Annex 3	No signs of change	Per lot



4 Conformity mark

The building product shall be marked by the manufacturer, using the conformity mark ("Ü" mark) in compliance with the conformity marking regulations of the federal states. The conformity mark shall be provided on the packaging with all the required details.

5 Legal basis

This General Building Code Test Certificate is issued on the basis of articles 25a of the building code of Lower Saxony (NbauO) in conjunction with Bauregelliste A, Part 2, No. 1.4 (as amended).

6 General annotations

- 6.1 The General Building Code Test Certificate is subject to revocation. The provisions of the General Building Code Test Certificate may be subsequently amended or revised, in particular if and when required as a result of new technical findings.
- 6.2 The General Building Code Test Certificate (abP) shall not be construed as replacing any of the building permits, approvals and certificates required by law for the performance of building projects.
- 6.3 The General Building Code Test Certificate (abP) is issued without prejudice to the rights of third parties, which concerns, in particular, private property rights.
- 6.4 Producers or distributors of the building product shall, without prejudice to any additional regulations, furnish the user of the building product with copies of the General Building Code Test Certificate (abP). The user shall hold the General Building Code Test Certificate ready on site.
- 6.5 The General Building Code Test Certificate (abP) may not be copied unless as a complete text. Excerpts of the Certificate may only be published with the prior permission of the inspection body issuing the Certificate. The wording of, or drawings used in, advertising brochures must not be in conflict with the contents of the General Building Code Test Certificate. Translations of the General Building Code Test Certificate shall bear the note "translation of the German original not checked by the Braunschweig Materials Testing Institute".

Braunschweig, 9 March 2010



Dr.-Ing. K. Herrmann
Head of Testing Laboratory



i.A.



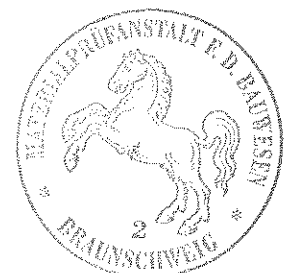
M. Pankalla
Engineer/official in charge

Properties of the swellable INDU-FLEX-CJ13 joint tape

- Appearance: red, rubber-elastic, homogeneous
- Density: 1.25 g/cm³
- Weight loss: 73.4 wt %
(TGA, 25° C to 1000° C)
- TGA: see annex 2
- Swelling capacity after
(gain in weight)
 - Ca(OH)₂ storage (pH 12):
 - 2 h = 21 wt %
 - 1 d = 139 wt %
 - 8 d = 428 wt %
 - H₂SO₄ storage (pH 4.5):
 - 2 h = 9 wt %
 - 1 d = 99 wt %
 - 8 d = 301 wt %
 - Storage in water (demin.):
 - 2 h = 54 wt %
 - 1 d = 464 wt %
 - 8 d = 1043 wt %
- Swelling pressure: 1.06 N/mm²
- Flammability: class E acc. to DIN EN 13501-1

Properties of the installation adhesive

- Appearance: transparent, clear, paste-like, homogeneous
- Density: 0.97 g/cm³
- Infrared spectrum: see annex 3

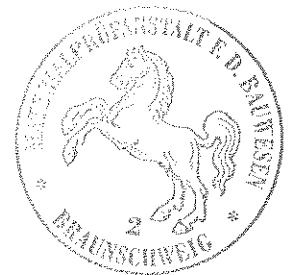
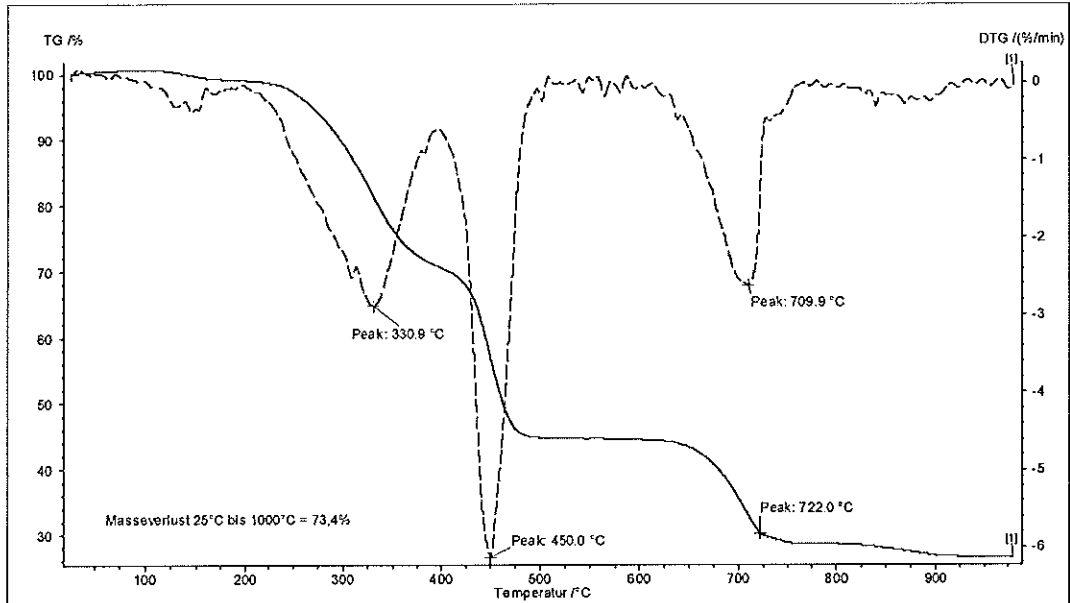


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Thermogravimetric analysis

Swellable INDU-FLEX-CJ13 tape

Thermogravimetric analyses were made on the basis of DIN EN ISO 11358 specifications. The heating rate was 10 K/minute. Measurements were made with a thermoanalysing station in a nitrogen atmosphere and with synthetic air. The weight loss was determined at temperatures between 25°C and 1000°C.

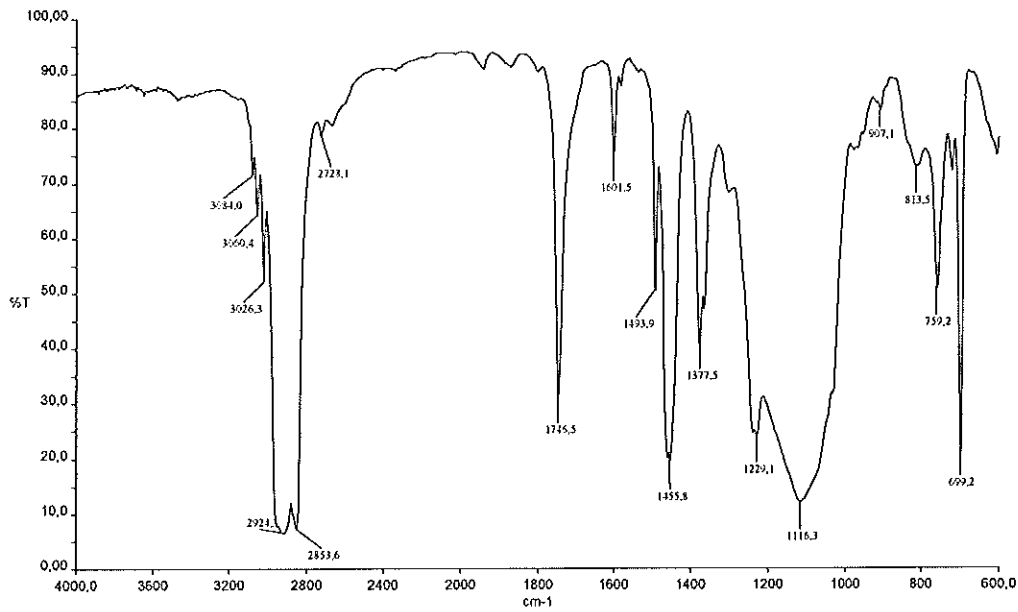


Infrared spectrum

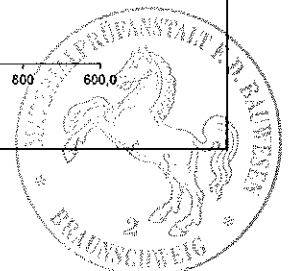
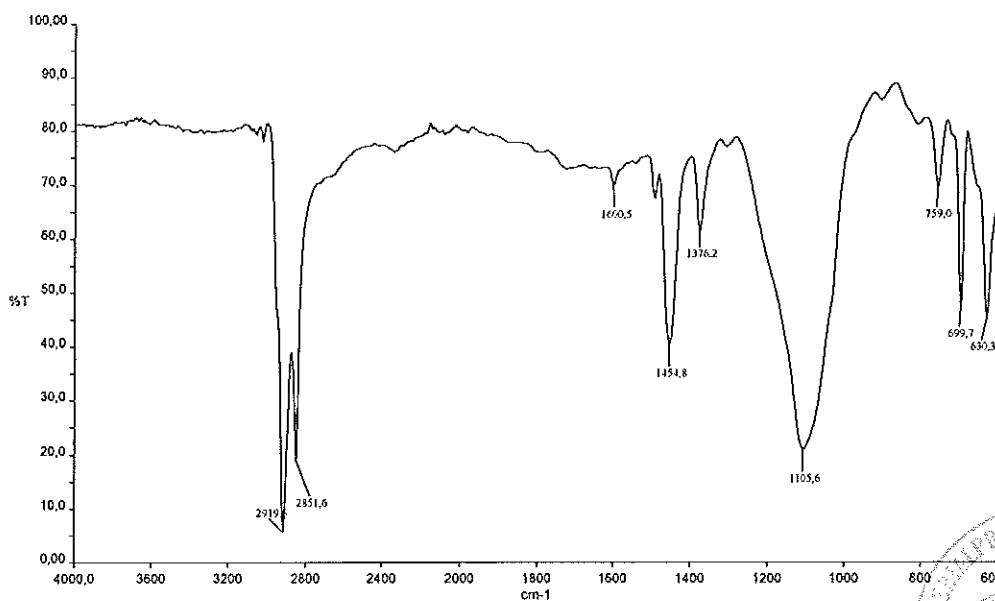
Installation adhesive

The IR analyses were made with a Perkin-Elmer FTIR unit of type Spectrum 2000 Explorer, wave number range 4000 cm^{-1} to 600 cm^{-1} . The quantities of the samples were selected so that the DIN 51451 requirements respecting extinction conditions were complied with.

The installation adhesive was removed from the cartridge, applied to a ZnSe sample holder (without having been preconditioned) and then analysed under the spectroscope.



A hardened sample of the material (7-day hardening time) was analysed with the Golden Gate Single Reflection ATR System.



Manufacturer's Technical Data Sheet

INDU-FLEX-CJ13

Art.-No. 5 55111

Thermoplastic expansive waterstop for waterproofing construction joints

Properties:

- Easy to use
- Rapid and intensive expansion
- Self injecting function due to penetration into cracks and voids
- Completely dimensionally stable, also at high temperatures
- Infinite expansion process often reversible
- Suitable for fresh water and salt water
- General technical building certificate available

Areas of application:

INDU-FLEX-CJ13 is used for the internal waterproofing of construction joints in concrete constructions, where there is a constant or intermittent exposure to ground water, run-off water or surface water. It can be applied in zones where the water level is in constant change, without problem. The construction joints can be formed watertight against water under pressure to a depth of 8 m.

Substrate preparation:

The substrate must be load-bearing, mostly flat and have a closed surface texture. It must be free from gravel pockets, cavities, gaping cracks, dust and be free from adhesion inhibiting substances. Laitance layers are to be removed, mechanically abraded (sand blasted) as necessary. During the application of INDU-FLEX-CJ13 the substrate may be moist damp. The formation of puddles is not permitted.

Product application:

It is essential that there is > 8 cm of concrete from the side exposed to water. INDU-FLEX-CJ13 can be bonded with the installation adhesive for expansive waterstops (Montagekleber für Quellbänder). Thoroughly apply the installation adhesive to the prepared substrate and press the INDU-FLEX-CJ13 into the adhesive until it oozes from the underside. The concreting process can proceed no earlier than

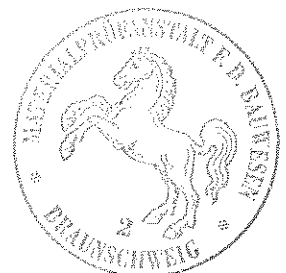
8 hours after bonding. The connecting of waterstops can be carried out by overlapping by a minimum of 30 mm or by butt jointing. It is essential that both the waterstops are tight up against one another to avoid flaws. Butt jointed waterstops are to be secured with a separate waterstop overlapped to both by a minimum of 30 mm.

Technical Data:

Basis:	TPE (thermoplastic elastomer)
Format:	Waterstop profile is quadratic + flexible
Colour:	red
Dimensions:	5 x 20 mm
Start of swelling on water contact:	approx. 6 hours
Expansion ability:	approx. 140% after 24 hours approx. 400% after 72 hours approx. 800% after 14 days
Toxicity:	none
Packaging:	25 m rolls = 175 m per box
Storage:	dry, frost free and protected from weathering, max. 5 years in the original unopened packaging.

Advice:

- It is essential to store the waterstop dry.
- Waterstops must lie flat and planar on the concrete. There must be no contaminants beneath the waterstop.
- Protect the waterstop from moisture until the concrete is poured.
- Before commencing the concreting process visually inspect the waterstop. Heavily swollen waterstop tape is unsuitable and must be removed.
- Waterstops are not suitable for movement joints.



Manufacturer's Technical Data Sheet

Montagekleber

Installation adhesive for waterstops

Art.-Nr. 2 07217

Properties:

- One component
- Contains solvent
- Resistant to weathering, ageing and UV light

Areas of application:

For bonding AQUAFIN-CJ3, AQUAFIN-CJ4 or INDU-FLEX-CJ13 expanding waterstops to concrete substrates.

Technical Data:

Basis:	polycarbon-ester
Consistency:	paste
Colour:	clear/transparent
Density:	approx. 1.05 g/cm ³
Total deformation tolerated:	max. 15%
Skin formation:	immediately moisture proof
Smoothing time:	approx. 30 mins
Substrate/application temp:	+5 °C to +40 °C
Temperature resistance:	-25 °C to +95 °C
Resilience (recovery):	> 80%
Volume change:	approx. -6%
Consumption:	approx. 8-10 ml/cartridge dependent on the adhesive thickness and width of the adhesion zone
Storage:	frost free, 24 months in the original unopened container

underside. The concreting process can proceed 8 hours after bonding, at the earliest.

Advice:

- Inflammable.
- Keep out of the reach of children. Only use in well ventilated areas.
- Observe the accident prevention regulations.
- Protect areas not to be treated with the installation adhesive from its effects.
- Please follow the technical data sheets for AQUAFIN-CJ3, AQUAFIN-CJ4 as well as INDU-FLEX-CJ13.

Please observe a valid EU Health & Safety Data Sheet.

Substrate preparation:

Smooth surfaces may be moist damp, open pored surfaces must be mostly dry. Due to the very high adhesion, the installation adhesive drags when pulled away. Therefore remove the cartridge press with a jolt. Spread the installation adhesive thoroughly over the prepared substrate and press the appropriate expansive waterstop into the adhesive until it oozes from the

