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Agrément Certificate
13/5053
Product Sheet 1

XYPEX HYDROPHILIC WATERSTOPS

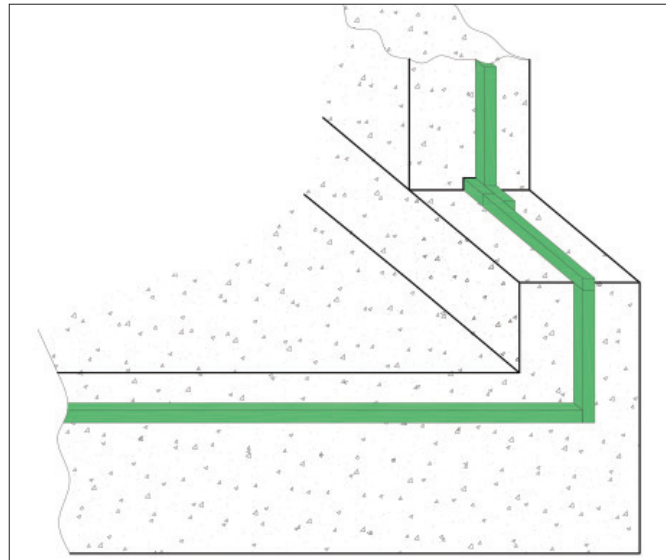
HYDROSWELL BENTOSTRIP

This Agrément Certificate Product Sheet⁽¹⁾ relates to Hydroswell⁽²⁾ Bentostrip, a flexible, hydrophilic waterstop for use at construction joints and penetrations in underground reinforced and waterproof concrete structures.

- (1) Hereinafter referred to as 'Certificate'.
(2) Hydroswell is a registered trademark.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.




KEY FACTORS ASSESSED

Resistance to water pressure — the product provides an effective barrier to the passage of moisture from the ground (see section 6).

Durability — when fully enclosed in a concrete structure the product will remain effective as a waterstop for the life of the structure in which it is incorporated (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 7 November 2013

Simon Wroe
Head of Approvals — Materials

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Hydroswell Bentostrip, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C2(a)	Resistance to moisture
Comment:		The product is an effective barrier to water. See sections 6.1 and 6.2 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 8 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The product is acceptable. See section 8 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.4	Moisture from the ground
Comment:		The product is an effective barrier to water, with reference to clauses 3.4.1 ⁽¹⁾⁽²⁾ , 3.4.5 ⁽¹⁾⁽²⁾ and 3.4.7 ⁽¹⁾⁽²⁾ . See sections 6.1 and 6.2 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for this product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012

Regulation:	23(a)(i)(iv)(b)(i)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 8 and the <i>Installation</i> part of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The product is an effective barrier to water. See sections 6.1 and 6.2 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.1 and 3.3) of this Certificate.

Additional Information

NHBC Standards 2013

NHBC accepts the use of Hydroswell Bentostrip, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 5.1 *Substructure and ground bearing floors*, clauses D16 (requiring proprietary waterproofing materials to comply with Technical Requirement R3) and M10 (requiring a system or product to be assessed in accordance with Technical Requirement R3).

Technical Specification

1 Description

1.1 Hydroswell Bentostrip is a green, 25 mm wide by 20 mm thick flexible hydrophilic waterstop.

1.2 Ancillary items that can be used in the installation of the product and which are included in this assessment are as follows:

- Hydroswell Bentosteel — galvanized steel wire mesh for supporting Hydroswell Bentostrip during placement of concrete. The product has a mesh size of 10.6 mm by 10.6 mm and a cross-section of 25.5 mm by 9 mm
- masonry fixing nails — 40-50 mm long with 20 mm diameter washers
- shot-fired fixings — Hilti EM6-20-12 FP8 with 6 mm nuts and 20 mm diameter washers.

1.3 Other items that can be used with the product but which are outside the scope of this Certificate include:

- adhesive mastic — used to secure Hydroswell Bentostrip to the concrete substrate where the use of Bentosteel is not possible
- swellable mastic — for levelling uneven surfaces prior to the application of Hydroswell Bentostrip.

2 Manufacture

2.1 The product is manufactured by a batch process in which the compound is extruded into strips and cut to length.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by Euro-Quality System France (Certificate 031250/112B).

3 Delivery and site handling

3.1 The product is supplied in rolls 5 m in length which are packaged in cardboard boxes each containing six rolls and having a gross weight of approximately 23 kg. Boxes can be supplied on pallets containing a maximum of 24 boxes.

3.2 The product must be stored under cover, clear of the ground and protected from moisture, frost and other sources of contamination at a temperature between 5°C and 30°C.

3.3 Hydroswell Bentosteel is supplied in 1 m lengths packaged in cardboard boxes each containing 30 strips and weighing 1.3 kg.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Hydroswell Bentostrip.

Design Considerations

4 Use

4.1 Hydroswell Bentostrip is satisfactory for use as a Type B (structurally integral) protection (as defined in BS 8102 : 2009) to waterproof construction joints and penetrations in underground waterproof reinforced concrete structures.

4.2 The product is not suitable for use in movement joints.

4.3 The product swells on contact with water and must be fully confined within the concrete structure to form an effective seal.

4.4 The unconfined product will expand by approximately 200% by volume in neutral pH water. The expansion under alkaline and acidic water conditions will be less, but adequate to enable the product to form an effective seal when fully confined.

4.5 The product will shrink on drying but will re-hydrate on wetting and re-swell to provide an effective seal.

4.6 The ability of the product to expand and form an effective seal can be adversely affected by the groundwater chemistry. A detailed study of the ground and groundwater chemistry must be carried out to establish the presence of any contamination. The Certificate holder must be consulted in all cases.

4.7 The product has not been assessed for use in saline water conditions.

4.8 The product will develop a significant pressure when confined within a concrete structure and must be covered by at least 70 mm of concrete from each edge to avoid damage to the concrete.

5 Practicability of installation

5.1 The product must only be installed by contractors who have been trained and approved by the Certificate holder.

5.2 To avoid premature swelling, the product must be protected from contact with water until enclosed in the structure and must not be placed during rain or when rain is forecast.

6 Resistance to water pressure

6.1 When confined the product forms an effective barrier to water under pressure from the ground.

6.2 The product was tested at a maximum hydrostatic water pressure of 4.0 bar and remained watertight.



6.3 An appropriate safety factor must be applied to the maximum water pressure given in 6.2 and the use of additional waterproof protection should be considered depending on the specific risks associated with any particular structure.

7 Maintenance

As the product is confined within the structure and has suitable in-situ durability, maintenance is neither possible nor required.

8 Durability



8.1 Hydroswell Bentostrip will function effectively as a waterstop and provide an effective barrier to water under pressure for the life of the structure in which it is incorporated.

8.2 Care must be taken to ensure that the product remains in position and is not dislodged when concrete is poured over it nor damaged during subsequent actions, eg vibration.

Installation

9 General

9.1 Hydroswell Bentostrip must be placed onto smooth and dust-free concrete surfaces. Uneven and irregular surfaces must be levelled using a suitable mastic. The Certificate holder must be consulted for suitable products.

9.2 Dust, dirt and other debris must be removed using a stiff brush and/or suitable mechanical means.

10 Procedure

Placing

10.1 Hydroswell Bentostrip is unrolled and placed onto the concrete surface to sit centrally between the inner and outer rows of reinforcing bars.

10.2 A minimum of 70 mm concrete coverage must be ensured around all edges.

10.3 Roll ends must be placed to have an overlap of 100 mm and pressed firmly together.

Fixing

10.4 Bentosteel is then placed over the strip and fixed using nails with washers at approximately 250 mm centres.

10.5 When fixing the product around penetrations, the waterstop must be additionally secured with steel ties. The Certificate holder should be consulted for advice.

Enclosing

10.6 Prior to enclosing the Hydroswell Bentostrip the placed product must be inspected for damage and premature swelling. Damaged and/or swollen product must be replaced at this stage.

10.7 Concrete is then poured to enclose the product, compacting well around the waterstop but taking particular care not to dislodge or damage the strip during the process.

Technical Investigations

11 Tests

Tests were conducted on samples of Hydroswell Bentostrip and the results assessed to determine:

- product characteristics
- resistance to hydrostatic water pressure
- unrestrained swelling characteristics under alkali, neutral and acidic water conditions
- effect of wet/dry cycles on swelling characteristics
- load developed when restrained.

12 Investigations

The manufacturing process was evaluated, including methods for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

- BS 8102 : 2009 *Code of practice for protection of below ground structures against water from the ground*
BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

13 Conditions

13.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

13.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

13.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

13.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

13.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal.
- any claims by the manufacturer relating to CE marking.

13.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.