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Agrément Certificate  
**15/5194**  
Product Sheet 1

## BPA WATERPROOFING SYSTEMS

### CEMflex VB

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to CEMflex VB, for use as part of a Type B (structurally integral) protection, as defined in BS 8102 : 2009, to waterproof construction joints in underground waterproof reinforced concrete structures.

(1) Hereinafter referred to as 'Certificate'.

#### 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: 25 February 2015

John Albon — Head of Approvals  
Construction Products

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](http://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, CEMflex VB, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying 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 can contribute to satisfying this Requirement. See section 6 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)	Durability, workmanship and fitness of materials
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 <sup>(1)(2)</sup> , 3.4.5 <sup>(1)(2)</sup> and 3.4.7 <sup>(1)(2)</sup> . See section 6 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 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2012

Regulation:	23(a)(i)(iii)(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 can contribute to satisfying this Regulation. See section 6 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) of this Certificate.

# Additional Information

## NHBC Standards 2014

NHBC accepts the use of CEMflex VB, 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 CEMflex VB comprises a steel plate with a polymer-modified cementitious coating on both faces, for use as a waterstop at construction joints where crack movement is limited to  $\leq 0.2$  mm.

1.2 The product is supplied in strips 2.0 m long, with nominal cross-sectional dimensions of 150 mm x 1.2 mm.

1.3 Ancillary items necessary for installation of the product and included in this assessment are:

- CEMflex clips — used to secure lap joints in the product
- CEMflex  $\Omega$  holder — used to tie CEMflex VB to steel reinforcement and secure it in place during the concrete pouring process.

## 2 Manufacture

2.1 The product is manufactured using batch blending and coating techniques.

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 BPA GmbH has been assessed and registered as meeting the requirements of EN ISO 9001 : 2008 by TÜV SÜD (Certificate 1210036327 TMS).

2.4 The product is manufactured in Germany and is marketed/distributed in the UK by SURFASOLOGY International Ltd, Unit 143, Baldoyle Industrial Estate, Dublin 13, Republic of Ireland, tel: + 353 1 832 1005, e-mail: info@surfalogy.com

## 3 Delivery and site handling

3.1 CEMflex VB is supplied in wooden boxes with each box containing up to 50 pieces.

3.2 The product must be stored under cool, dry conditions and protected from contamination. When stored in accordance with the Certificate holder's instructions the undamaged product will have an indefinite shelf life.

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on CEMflex VB.

## Design Considerations

### 4 Use

4.1 CEMflex VB is satisfactory for use as part of a Type B (structurally integral) protection, as defined in BS 8102 : 2009, to waterproof construction joints in underground waterproof reinforced concrete structures.

4.2 Concrete structures must be designed in accordance with BS EN 1992-3 : 2006 with calculated crack widths of  $\leq 0.2$  mm.


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

4.4 The product has not been assessed for use in corrosive environments, eg saline or acidic conditions, nor for use in contact with potable water (see also section 8 of this Certificate). The Certificate holder can advise on the product's suitability for a particular application.

### 5 Practicability of installation

The product must only be installed by contractors who have been trained and approved by the Certificate holder. Details of these are available from the Certificate holder.

### 6 Resistance to water pressure

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

6.2 The product was tested at a crack width of 0.25 mm and remained watertight at the maximum hydrostatic water pressures given in Table 1.

*Table 1 Resistance to hydrostatic water pressure and overlap distance*

Minimum overlap (cm)	Maximum water pressure (bar)
5	2.0
20	5.0

6.3 An appropriate safety factor<sup>(1)</sup> must be applied to the maximum water pressure given in Table 1, and the use of additional waterproof protection should be considered, depending on the specific risks associated with any particular structure.

(1) A typical safety factor will be 2.5.

## 7 Maintenance

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

## 8 Durability



8.1 CEMflex VB 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 The durability of the product may be affected if it is dislodged or damaged during or following installation, therefore 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.

8.3 The durability of the product may be affected under corrosive conditions, eg saline or acidic conditions, causing corrosion of the steel plate. The Certificate holder must be consulted before the product is used under these and other conditions where contamination of the ground water is present.

## Installation

### 9 General

9.1 The installation of the CEMflex VB must be carefully planned to ensure that the product is properly routed and located, in order to achieve the specified minimum embedment depth and lap joint overlaps along the entire installation.

9.2 A minimum of 3 cm of the waterstop must be embedded into the concrete either side of the construction joint, and lap joints must be secured with CEMflex clips. A minimum of 6 cm concrete coverage must be ensured either side of the product.

### 10 Procedure

10.1 The product is positioned so that, if possible, it lies centrally along and perpendicular to the construction joint, and is fixed in position using CEMflex  $\Omega$  holders and steel wire.

10.2 The placement must ensure that when the base slab is poured the product is embedded into the wet concrete by at least 3 cm, maximum 12 cm.

10.3 The concrete must be carefully compacted around the product to eliminate air voids, taking care not to dislodge it.

10.4 Alternatively, the product can be pressed into the poured concrete, ensuring that at least 3 cm is embedded into the concrete.

10.5 Lap joints must be at least 5 cm or 20 cm, depending on the water pressure expected (see Table 1). Laps must be secured using CEMflex clips applied from the top edge, one clip for a 5 cm lap and two clips for a 20 cm lap.

10.6 The product can be easily bent by hand and formed to follow curves or around corners.

10.7 When placed and before the concrete has set, the installation must be inspected to ensure that the minimum embedment depth and overlap length have been observed and that the overlaps remain secured. Any adjustments must be made at this point before the concrete has set.

10.8 Prior to enclosing the product in concrete, the installation must be inspected for damage and any necessary repairs made. The Certificate holder must be consulted for advice if any section of the installed product has suffered significant damage.

10.9 The product is fully enclosed in concrete, ensuring that the product is embedded by a minimum 3 cm on the upper side of the construction joint.

10.10 The concrete must be well compacted to minimise the risk of air voids remaining present at the product/concrete interface, and allowed to set.

## Technical Investigations

### 11 Tests

Tests were conducted on samples of CEMflex VB and the results assessed to determine:

- product characteristics
- bond strength to fresh concrete
- resistance to hydrostatic water pressure.

### 12 Investigations

12.1 Visits were made to sites in progress to assess the practicability of installation.

12.2 Test data from an independent laboratory was examined relating to resistance to water pressure, product characteristics and bond strength to fresh concrete.

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

## Bibliography

BS EN 1992-3 : 2006 *Eurocode 2 — Design of concrete structures — Liquid retaining and containing structures*

NA to BS EN 1992-3 : 2006 UK National Annex to *Eurocode 2 — Design of concrete structures — Liquid retaining and containing structures*

BS 8102 : 2009 *Code of practice for protection of below ground structures against water from the ground*

EN ISO 9001 : 2008 *Quality management systems — Requirements*

## Conditions of Certification

### 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.