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Agrément Certificate  
**86/1650**  
Product Sheet 9

## VOLCLAY WATERPROOFING SYSTEM FOR STRUCTURES

### SEALMAT

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Sealmat, a self-bonding sodium bentonite and polypropylene geotextile membrane, for use as a damp-proof membrane in solid concrete ground floors and suspended concrete floor slabs not subject to hydrostatic pressure, to protect buildings against moisture from the ground.

(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 and water vapour** — the product, including joints, provides an effective barrier to the passage of liquid water and water vapour from the ground (see section 6).

**Resistance to puncture** — the product is resistant to damage and has the ability to self-repair if punctured (see section 7).

**Durability** — under normal service conditions the product will provide an effective barrier to the transmission of moisture for the life of the structure in which it is incorporated (see section 12).



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

Simon Wroe  
Head of Approvals — Materials

Claire Curtis-Thomas  
Chief Executive

Date of Second issue: 23 June 2014

Originally certificated on 13 October 2011

*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, Sealmat, 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, including joints, will enable a floor to meet this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 12 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:		Use of the product satisfies the requirements of this Regulation. See section 12 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, including joints, will enable a floor to satisfy the requirements of this Standard, with reference to clauses 3.4.1 <sup>(1)(2)</sup> , 3.4.2 <sup>(1)(2)</sup> and 3.4.4 <sup>(1)(2)</sup> to 3.4.6 <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 12 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 liquid water and water vapour. 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 sections: 3 *Delivery and site handling* (3.1 to 3.4) and 13 *General* (13.2) of this Certificate.

## Additional Information

### NHBC Standards 2014

NHBC accepts the use of Sealmat, 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*, clause M8 *Damp-proof membrane* (for use below the slab).

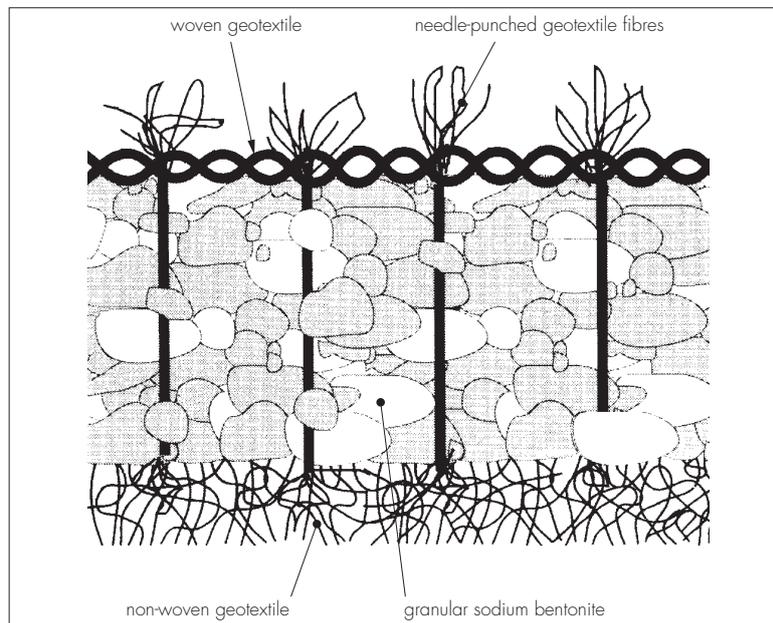
### CE marking

The Certificate holder has taken the responsibility of CE Marking the product in accordance with harmonised European Standard BS EN 13491 : 2004. An asterisk (\*) appearing in this Certificate indicates that the data shown are given in the manufacturer's declaration of performance.

## 1 Description

1.1 Sealmat is a self-bonding damp-proofing membrane, approximately 6.5 mm thick, consisting of two polypropylene geotextiles, one woven and one non-woven, enclosing granular sodium bentonite at a minimum weight of  $4.0 \text{ kg}\cdot\text{m}^{-2}$  (see Figure 1).

Figure 1 Cross-section through Sealmat



1.2 Ancillary items for use with the product include:

- Bentoseal — a trowel-grade sodium bentonite compound used for detailing work, eg around penetrations
- Volclay Granules — a loose form of granular sodium bentonite used (mixed with water) as a paste for detailing.

1.3 Quality control is exercised over raw materials, during manufacture and on the final product.

## 2 Manufacture

2.1 Sealmat is manufactured in a controlled continuous process in which partially-hydrated bentonite granules are uniformly distributed between woven and non-woven geotextiles. The two geotextiles are interlocked by a needle-punching process pushing fibres from the non-woven layer through and beyond the woven layer. This process links the geotextiles and contains and confines the bentonite.

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 manufacturer's management system has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM 36855).

## 3 Delivery and site handling

3.1 Sealmat is supplied in 1.1 m wide by 5.0 m long rolls, on pallets of 35 rolls, stacked horizontally and shrink-wrapped. Each roll weighs between 33 kg and 38.5 kg<sup>(1)</sup>.

3.2 Bentoseal is supplied in 25 kg tubs<sup>(1)</sup>.

3.3 Volclay Granules are supplied in 20 kg bags.

3.4 The product and components must be stored in dry conditions, under cover and away from the possibility of damage or premature contact with water.

(1) Weights and sizes are subject to change. Users are advised to consult current manufacturer's literature.

# Assessment and Technical Investigations

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

## Design Considerations

### 4 Use

4.1 Sealmat is satisfactory for use as a damp-proof membrane for concrete floors not subject to hydrostatic pressure, in accordance with the relevant clauses of CP 102 : 1973.

4.2 The product can also be installed as an oversite membrane, between the compacted soil or a concrete underblinding layer and the base concrete slab.

4.3 The product will remain flexible at the temperatures likely to occur in practice.

### 5 Practicability of installation

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

### 6 Resistance to water and water vapour



The product, including joints, provides an effective barrier to the passage of liquid water and water vapour at ground floor level.

### 7 Resistance to puncture

The polypropylene geotextiles containing the bentonite are robust and resistant to normal site activities. The dropping of heavy articles will normally have no damaging effect on the membrane. Any accidental cuts will self-repair when the membrane is hydrated following correct installation, provided that bentonite material is not lost from the edges of the cut.

### 8 Chemical resistance

8.1 The gelling of sodium bentonite is adversely affected by the presence of electrolytes (particularly trivalent ions) and may also be affected by the presence of soluble cations such as those found in chalk or lime soils. In such cases advice should be sought from the Certificate holder.

8.2 The product is not affected by organic contaminants.

8.3 In chemically-contaminated areas the product is hydrated by deliberate soaking with mains water and leaving for two to three hours before placing the backfill or pouring the concrete.

### 9 Resistance to loading

Provided the product is adequately confined, properly hydrated and not subjected to point loading, an installation beneath a foundation slab will transmit dead and imposed loads to the ground safely and without excessive deformation. In situations where point loading is anticipated the Certificate holder's advice should be sought.

### 10 Adhesion

When concrete is cast against the product the free ends of the needle-punched fibres become embedded in the concrete, creating a permanent bond between the concrete and membrane.

### 11 Maintenance

As the product is confined by the concrete and has suitable durability (see section 12), maintenance is not required.

### 12 Durability



A fully-protected Sealmat membrane, when installed at ground floor level with the appropriate ancillary products, will provide an effective barrier to water and water vapour for the life of the building in which it is incorporated.

## Installation

### 13 General

13.1 Sealmat is installed in accordance with the Certificate holder's instructions and of CP 102 : 1973, clause 11, the relevant clauses of BS 8000-4 : 1989 and section 14 of this Certificate.

13.2 Sealmat may be applied under most normal site conditions, including subzero temperatures and during heavy rainfall. Under wet conditions the product can withstand light construction traffic without significant extrusion of the bentonite. Slight losses at the exposed edges of a lap joint will not impair the watertightness, provided the conditions given in section 15 are met. Any bentonite that extrudes from the membrane will become slippery when wet which can have an adverse effect on site safety.

13.3 The product bonds to poured concrete to form an integral seal to prevent water migration and requires no priming, fillets or protection boards.

13.4 The product is easy to handle and can be cut using a sharp knife.

13.5 The product and components must never remain permanently exposed.

## 14 Procedure

14.1 Surfaces to be waterproofed should be reasonably smooth and may be damp, but must be free from standing water. Earth and sand substrates should be compacted to a minimum 85% Modified Proctor.

14.2 Sealmat is installed with the woven geotextile in contact with the concrete surface to be waterproofed.

14.3 The damp-proof membrane must be continuous and linked in with the damp-proof course in the surrounding walls. Where necessary the product should be used as a vertical damp-proof course to link the two. The damp-proof membrane and damp-proof course joint must be overlapped a minimum 100 mm and sealed. Where there is any doubt about the compatibility of materials, the advice of the Certificate holder should be sought.

14.4 At the edge of the slab the membrane is applied to the inside of the formwork, secured by nailing or staples so that when the concrete is cast against the membrane the free ends of the needle punched fibres become embedded in the concrete, creating a permanent bond between the concrete and membrane.

14.5 The formation of a continuous damp-proofing barrier is achieved using lap joints with a minimum overlap of 100 mm between adjoining edges and roll ends. It is recommended to stagger laps at a minimum of 300 mm to avoid four sheets overlapping in one location. All lap joints are secured by either stapling laps together, or fixing them to the base with fasteners.

14.6 Overlaps should be stapled or nailed to prevent displacement during concrete placement.

14.7 Sealing around protrusions through the membrane, eg at such details as piles and service pipes, is carried out by cutting a hole in the membrane and fitting over the protrusion, and sealing around the top of the membrane with either Bentoseal or a paste made up, in situ, by mixing Volclay Granules with water.

14.8 The concrete slab to be poured should have a minimum thickness of 150 mm.

## 15 Repair

Where bentonite material is lost from the membrane, Bentoseal can be applied over the damaged area or, if the damage is more extensive, the membrane must be replaced with fresh Sealmat.

## Technical Investigations

### 16 Tests

16.1 A trial installation was built and observations were made of the practicability of installation at corners, laps and around obstructions, and the rate and pattern of water penetration.

16.2 Tests were conducted to determine:

- resistance to electrolytes
- resistance to rainfall (natural exposure)
- resistance to rainfall (cyclic water spray with simulated traffic)
- bond strength between Sealmat and poured concrete
- stability of bentonite granules within the membrane during normal site handling.

### 17 Investigations

17.1 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.

17.2 An assessment was made of independent reports relating to:

- hydraulic conductivity under water pressure
- low-temperature flexibility
- mechanical properties of the geotextiles
- water vapour transmission through hydrated membrane.

17.3 Existing data on the effectiveness and durability of natural sodium bentonite as a damp-proofing membrane were examined.

## Bibliography

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS EN 13491 : 2004 *Geosynthetic barriers — Characteristics required for use as a fluid barrier in the construction of tunnels and associated underground structures*

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

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

## Conditions of Certification

### 18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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.