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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
06/4380
Product Sheet 1

PITCHMASTIC PmB WATERPROOFING SYSTEM

BLUESHIELD TANKING WATERPROOFING SYSTEM

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Blueshield Tanking Waterproofing System, a two-part, spray applied system for use on solid concrete floors and underground structures, and for internally and externally applied tanking below ground.

AGRÉMENT 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 system will resist the passage of moisture into the structure (see section 5).

Resistance to mechanical damage — the system will accept the limited foot traffic and loads associated with installation and in service (see section 6).

Durability — under normal service conditions, the system will provide an effective barrier to the transmission of moisture for the life of the structure in which it is incorporated (see section 9).

The BBA has awarded this Agrément Certificate to the company named above for the system described herein. The system 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: 3 May 2011
Originally certificated on 16 October 2006

Stuart Sadler
Head of Approvals — Materials

Greg Cooper
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, the Blueshield Tanking Waterproofing System, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

The Building Regulations 2010 (England and Wales)

Requirement:	**C2(a)**	**Resistance to moisture**
Comment:		The system will enable a structure to meet this Requirement. See section 5.1 of this Certificate.
Requirement:	**Regulation 7**	**Materials and workmanship**
Comment:		The system is acceptable. See section 9 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Fitness and durability of materials and workmanship**
Comment:		The system satisfies the requirements this Regulation. See section 9 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards — construction**
Standard:	3.4	Moisture from the ground
Comment:		The system will enable a structure to satisfy the requirements of this Standard, with reference to clauses 3.4.1[1][2], 3.4.2[1][2] and 3.4.5[1][2] to 3.4.7[1][2]. See section 5.1 of this Certificate.
Regulation:	**12**	**Building standards — conversions**
Comment:		All comments given for this system under Regulation 9, 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) 2000 (as amended)

Regulation:	**B2**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See section 9 and the *Installation* part of this Certificate.
Regulation:	**C4(a)**	**Resistance to ground moisture and weather**
Comment:		The system will enable a structure to satisfy the requirements of this Regulation. See section 5.1 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: 1 *Description* (1.1) and 2 *Delivery and site handling* (2.1 and 2.3) of this Certificate.

Non-regulatory Information

NHBC Standards 2011

NHBC accepts the use of the Blueshield Tanking Waterproofing System, when installed and used in accordance with this Certificate, as meeting *NHBC Standards*, Chapter 5.1 *Substructure and ground bearing floors* clauses M8 *Damp-proof membrane* (for use below the slab and in sandwich constructions) and M10 *Tanking materials* (for use as part of an external basement tanking system).

Technical Specification

1 Description

1.1 The Blueshield Tanking Waterproofing System comprises:

- Blueshield PMCS/01 Primer — a single-component, solvent-based primer containing di-phenylmethane di-isocyanate
- Blueshield Tanking Waterproofing — a two-part, solvent-free, blue pigmented polyurethane elastomer, comprising; Part A, PmB PU 0308/catalyst/blue pigment and Part B, Desmodur PU 0309.

1.2 The components of the system are manufactured by a batch-blending process. Quality control checks are carried out on the incoming materials, during production and on the finished components.

2 Delivery and site handling

2.1 The components of the system are delivered as detailed in Table 1. The waterproofing components are transferred into bulk storage vessels, located on the spray vehicle, and maintained at 50°C to 80°C prior to spraying.

Table 1 Weights and packaging

Component	Weight (kg)	Container	Shelf-life (months
Blueshield PMCS/01 Primer	25	Metal/plastic drums	6
Blueshield Tanking Waterproofing (Part A)	25/1000	Metal drums/plastic IBC's	6
Blueshield Tanking Waterproofing (Part B)	25/1000	Metal drums/plastic IBC's	6

2.2 The components are classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009* (CHIP4) and all containers bear the appropriate hazard warning label(s). Flashpoints and hazard classification are given in Table 2.

Table 2 Flashpoint and hazard classification

Component	Flashpoint (°C)	Classification
Blueshield PMCS/01 Primer	3	Highly flammable(1)/Harmful
Blueshield Tanking Waterproofing (Part A)	165	Harmful
Blueshield Tanking Waterproofing (Part B)	>200	Harmful

(1) The product should be stored in accordance with *The Dangerous Substances and Explosives Atmospheres Regulations 2002.*

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Blueshield Tanking Waterproofing System.

Design Considerations

3 General

3.1 The Blueshield Tanking Waterproofing System is satisfactory for use as a damp-proofing and waterproofing membrane for solid ground floors, underground structures and for internally and externally applied tanking below ground in accordance with the relevant requirements of CP 102 : 1973, Section 3 and all grades of basement constructions as defined in Table 2 of BS 8102 : 2009 and the Certificate holder's instructions.

3.2 The system is compatible with concrete, smooth brickwork, blockwork and screeded substrates, and is resistant to those chemicals likely to occur in normal service conditions.

4 Practicability of installation

The system is installed by the Certificate holder.

5 Resistance to water and water vapour

5.1 The system will adequately resist the passage of moisture from the ground into the structure and enable a structure to comply with the requirements of the national Building Regulations:

England and Wales — Approved Document C, Requirement C2(a), Section 4.7
Scotland — Mandatory Standard 3.4, clauses 3.4.1, 3.4.2 and 3.4.5 to 3.4.7
Northern Ireland — Regulation C4(a).

5.2 The system is impervious to water and will give a waterproof layer capable of accepting minor structural movements without damage.

6 Resistance to mechanical damage

6.1 The adhesion of the system to a properly prepared substrate is satisfactory.

6.2 The system has adequate resistance to damage that might be caused by sharp implements or stones. However, unnecessary traffic should be avoided.

6.3 Provided sufficient care is taken the system will not be damaged by normal foot traffic.

7 Effect of temperature

The system is not adversely affected by temperatures likely to occur in service.

8 Maintenance

As the system is confined within the structure and it has satisfactory durability, maintenance is not required. Any damage occurring during construction works must be repaired in accordance with section 13 prior to the application of protection or backfilling.

9 Durability

When subjected to normal service conditions, the system will provide an effective barrier to the transmission of moisture for the life of the structure in which it is incorporated.

Installation

10 General

10.1 The Blueshield Tanking Waterproofing System must be installed in accordance with the relevant requirements of CP 102 : 1973, Section 2, or BS 8102 : 2009 and the Certificate holder's instructions. Additional guidance is available in BS 8000-4 : 1989.

10.2 Concrete or screeded surfaces should have a smooth finish, free from cavities, loosely-adhering material and sharp protrusions. Surfaces should be dry and free from oil, grease, curing compounds, moss, algae growth, bituminous products, dust and frost.

10.3 Vertical surfaces of brickwork and blockwork should be rendered to provide an even surface. Brickwork or blockwork not rendered must be flush-pointed to give a smooth surface without sudden changes in level.

10.4 Installation should not be carried out during inclement weather (eg rain, fog, snow). When the temperature is below 5°C, suitable precautions against surface condensation must be taken. During the installation of the system the substrate temperature must be above the dew-point.

11 Construction

11.1 Substrates should be primed and allowed to dry prior to the application of the system, see section 12.1.

Solid concrete floors

11.2 In the floor it is essential to extend the system up the internal wall surfaces as far as the damp-proof course, and tie it in with the damp-proof course to form a continuous waterproof membrane. A sand/cement screed should be laid as soon as possible after application.

External tanking

11.3 The system is applied to the sub-base to a minimum of 200 mm beyond the proposed external wall line. After construction of the wall, the system on the sub-base should be cleaned with a suitable solvent, prior to overcoating and extending up the vertical face.

11.4 The system does not require additional protection, but care should be taken during backfilling following good site practice.

Internal tanking

11.5 The system is applied to the surfaces to be waterproofed.

11.6 In all instances, to resist the action of external water pressure, a wall (preferably of concrete) must be constructed immediately after the application of the system. Where brickwork or blockwork is used, it should be set 40 mm away from the coated wall and the void thoroughly filled with sand/cement mortar.

12 Application

Primer

12.1 Blueshield PMCS/01 Primer is applied by airless spray at a coverage rate of 40 $g \cdot m^{-2}$ to 65 $g \cdot m^{-2}$, or by roller or brush at a coverage rate of 65 $g \cdot m^{-2}$ to 110 $g \cdot m^{-2}$ dependent on the porosity of the concrete.

12.2 The primer is over-sprayed with Blueshield Tanking Waterproofing membrane within 24 hours of application, provided the primed surface is clean and dry.

12.3 If the 24 hours is exceeded or the primed surface becomes wet due to rain or condensation, the primer must be abraded and the area re-primed.

Waterproofing membrane

12.4 The Blueshield Tanking Waterproofing, components Part A and Part B, are stored in temperature-controlled tanks, maintained at 50°C to 80°C, within the spray equipment plant during application.

12.5 The spray equipment is computer controlled, and maintains a Part A : Part B mix ratio of 100:96 ± 5% by weight.

12.6 The Blueshield Tanking Waterproofing membrane (pigmented blue), is spray applied in one coat, two coats or multiple coats at a coverage rate of 3 $kg \cdot m^{-2}$ to give a minimum total thickness of 2 mm including peaks, arises and irregularities in the concrete deck.

12.7 In the two-coat system, a minimum thickness of 1 mm is applied in the first coat and allowed to dry. Within four hours the second coat is applied to achieve a total minimum thickness of 2 mm. In the multiple coat system, each coat is applied within four hours of the previous coat to achieve a total minimum thickness of 2 mm. Where the four-hour interval in the two-coat and multiple coat system is exceeded, an additional coat of Blueshield PMCS/01 Primer is required before the next coat is applied.

Lapping

12.8 Where a new waterproofing membrane is joined to an existing Blueshield Tanking Waterproofing membrane and at day joints, the new application must be lapped onto the existing membrane by a minimum 100 mm.

12.9 Where the existing membrane is clean and less than four hours old, no additional preparation is necessary. If it is dirty or contaminated, the membrane surface must be cleaned using a suitable solvent, eg acetone.

12.10 Where the existing membrane is over four hours old, Blueshield PMCS/01 Primer must be applied to give a minimum margin of 20 mm greater than the lap and allowed to dry.

13 Repair of defects

Pin/blow holes

13.1 Within four hours of membrane application, identified pin/blow holes are over-sprayed with Blueshield Tanking Waterproofing membrane to a minimum thickness of 2 mm.

13.2 After four hours of membrane application, the area over and around any pin/blow holes should be cleaned using a suitable solvent, ensuring a minimum 150 mm lap. The repair area is abraded and Blueshield PMCS/01 Primer applied by brush or spray.

13.3 A minimum of 30 minutes must be allowed for the primer to dry and the Blueshield Tanking Waterproofing membrane then applied to a minimum thickness of 2 mm, ensuring a minimum peripheral lap of 100 mm around the repair.

Blisters and damage

13.4 These are made good by cutting back to sound material and repairing as described in sections 13.1 to 13.3.

14 On-site quality control

Site control checks are made by the Certificate holder's trained operatives in accordance with their instructions.

Technical Investigations

15 Tests

Samples of the system were prepared by the Certificate holder for testing. The results of the tests carried out by the BBA, which are typical values for the material, are summarised in Tables 3 and 4.

Table 3 Tests on the Blueshield Tanking Waterproofing Membrane

Test (units)	Mean result	Method
Water vapour permeability ($g \cdot m^{-2} \cdot day^{-1}$)	19.1[1]	BS 3177 (75% RH/25°C)
Water vapour resistance ($MN \cdot s \cdot g^{-1}$)	10.7	BS 3177 (75% RH/25°C)
Water absorption (%)	4.8	BD 47, Appendix B : B4.1(c)
Tensile strength ($N \cdot mm^{-2}$)		BS EN ISO 527-3
unaged	9.5	
180 days heat aged at 70°C	12.2	
28 days water soak at 23°C	9.3	
500 hours UV aged	10.7	
Elongation at break (%)		BS EN ISO 527-3
unaged	234	
180 days heat aged at 70°C	324	
28 days water soak at 23°C	258	
500 hours UV aged	307	
Resistance to water penetration	satisfactory	BD 47, Appendix B : B4.1(d)

(1) 2.4 mm thick sample.

Table 4 Tests on the Blueshield Tanking Waterproofing System

Test (units)	Mean result	Method
Resistance to chisel impact at		BD 47, Appendix B : B4.2(h)
–10°C	satisfactory	
23°C	satisfactory	
40°C	satisfactory	
Thermal shock, heat ageing and crack cycling at		BD 47, Appendix B : B4.2(j)
–10°C	satisfactory	
23°C	satisfactory	
40°C	satisfactory	
Resistance to aggregate indentation at		BD 47, Appendix B : B4.2(i)
40°C	satisfactory	
80°C	satisfactory	
125°C	satisfactory	
Tensile adhesion to concrete at 23°C ($N \cdot mm^{-2}$)		BD 47, Appendix B : B4.2(d)
unaged	1.41	
28 days heat aged at 70°C	1.60	
28 days water soak at 23°C	1.15	

16 Investigations

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

16.2 A visit was made to a site in progress to assess the practicability of installation.

Bibliography

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

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

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

BS EN ISO 527-3 : 1996 *Plastics — Determination of tensile properties — Test conditions for films and sheets*

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

BD 47/94 *Waterproofing and Surfacing of Concrete Bridge Decks, Appendix B Certification Test Requirements for Waterproofing Systems on concrete Bridge Decks*

Conditions of Certification

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

17.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

17.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

17.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

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