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Agrément Certificate
16/5327
Product Sheet 1

DECKMASTER ROOF WATERPROOFING SYSTEMS

DECKMASTER SYSTEM BM

This Agrément Certificate Product Sheet(1) relates to Deckmaster System BM, for use as a waterproofing layer in inverted roofs and protected flat roofs, including zero pitched roofs.
(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

Weathertightness — the system will resist the passage of moisture into a building (see section 6).

Properties in relation to fire — when used in a suitably-protected specification, the system will be unrestricted under the national Building Regulations (see section 7).

Resistance to wind uplift — the system will resist the effects of any likely wind suction acting on the roof (see section 8).

Resistance to mechanical damage — the system will accept the limited foot traffic and loads associated with installation and maintenance, and the effects of thermal or other minor movement likely to occur in service (see section 9).

Durability — under normal service conditions and when fully protected, the system will provide a durable roof waterproofing for the design life of the roof in which it is incorporated (see section 11).

The BBA has awarded this Certificate to the company named above for the system described herein. This 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: 8 July 2016

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
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, Deckmaster System BM, 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:	**B4(2)**	**External fire spread**
Comment:		On flat roofs the system, when used with a suitable surface protection, will enable a roof to be unrestricted under this Requirement. See section 7 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The system will enable a structure to meet this Requirement. See section 6.1 of this Certificate.
Regulation:	**7**	**Materials and workmanship**
Comment:		The system is acceptable. See section 11.1 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Durability, workmanship and fitness of materials**
Comment:		The use of the system satisfies the requirements of this Regulation. See sections 10 and 11.1 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.8	Spread from neighbouring buildings
Comment:		On flat roofs the system, when used with suitable protection, can be regarded as having low vulnerability and will enable a roof to be unrestricted, with reference to clause 2.8.1[(1)(2)] of this Standard. See section 7 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1[(1)(2)] and 3.10.7[(1)(2)]. See section 6.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system 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:		Comments in relation to the system 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 (as amended)

Regulation:	**23(a)(i)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The system is acceptable. See section 11.1 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The system will enable a roof to meet the requirements of this Regulation. See section 6.1 of this Certificate.
Regulation:	**36(b)**	**External fire spread**
Comment:		On flat roofs the system, when used with a suitable surface protection, will enable a roof to be unrestricted under this Regulation. See section 7 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2007

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

See section: 3 *Delivery and site handling* (3.2 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2016

NHBC accepts the use of Deckmaster System BM, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Part 7 *Roofs*, Chapter 7.1 *Flat roofs and balconies*.

Technical Specification

1 Description

1.1 Deckmaster System BM is a cold liquid-applied system consisting of the following components:

- Deckmaster Membrane — a two-part, liquid-applied polyurethane consisting of a resin component and a hardener
- Deckmaster DPM Primer — a two-part primer for use in preparing concrete substrates and polymer-modified sand/cement screeds with a moisture content greater than 75% relative humidity, prior to application of the carrier membrane
- Deckmaster PU Primer — a single component primer for use in preparing timber and concrete substrates and polymer-modified sand/cement screeds with a moisture content less than 75% relative humidity, prior to application of the carrier membrane
- Deckmaster Carrier Membrane — a 0.6 mm thick, self-adhesive carrier membrane for use over primed substrates prior to application of Deckmaster Membrane
- Deckmaster 0712 Quartz Sand — kiln-dried quartz sand broadcast into wet Deckmaster DPM Primer, to produce a mechanical key for sand/cement screeds and bedding mortars when used as an alkali protection layer.

1.2 Pumasolve can be used in conjunction with the system to clean substrates and to improve bonding of subsequent coats after a working break of more than 36 hours, and as a solvent to clean tools post-work.

2 Manufacture

2.1 Deckmaster Membrane, Deckmaster DPM Primer and Deckmaster PU Primer are manufactured by batch-blending processes.

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 being operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 The system components' packaging bears labels with the component name, size, Certificate holder's name, batch number, CLP hazard labelling information (where appropriate) and the BBA logo incorporating the number of this Certificate.

3.2 The system components are packaged as given in Table 1.

Table 1 Component packaging and dimensions

Component	Packaging	Packaging size
Deckmaster Membrane 15 kg unit: – resin – hardener	 plastic pail plastic bottle	 20 litre 3 litre
Deckmaster DPM Primer 10 kg unit: – resin – hardener 20 kg unit: – resin – hardener	 metal pail plastic bottle metal pail plastic bottle	 10 litre 5 litre 20 litre 10 litre
Deckmaster PU Primer	metal can	5 litre
Deckmaster Carrier Membrane	roll	40 m x 1080 mm
Deckmaster 0712 Quartz Sand	bag	25 kg
Pumasolve	metal can	5 litre

3.3 The components must be stored in a dry area, under cover, above freezing point and away from heat sources. The carrier membrane should be stored vertically on a flat, even surface if not stored on the delivery pallet.

3.4 The Certificate holder has taken the responsibility of classifying and labelling the system under the *CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures.* Users must refer to the relevant Safety Data Sheet(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Deckmaster System BM.

Design Considerations

4 General

4.1 Deckmaster System BM is for use as a roof waterproofing system for inverted roofs with limited access and protected flat roofs with limited or pedestrian access, including zero pitched roofs.

4.2 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for such duties as maintenance of the roof covering, cleaning of gutters etc. Where traffic in excess of this is envisaged, special precautions such as additional protection to the membrane must be taken.

4.3 For the purposes of this Certificate, flat roofs are defined as those having a minimum finished fall of 1:80, zero pitched roofs as those having a finished fall of between 0 and 0.7 degrees and pitched roofs as those having falls in excess of 1:6.

4.4 When designing flat roofs, twice the minimum finished fall should be assumed unless a detailed analysis of the roof is available, including such information as overall and local deflection and direction of falls.

4.5 Precast concrete, concrete block and timber decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2003 and, where appropriate, *NHBC Standards* 2016, Chapter 7.1.

4.6 Structural decks to which the system is to be applied must be suitable to transmit the dead and imposed loads experienced in service. Dead loads, wind loading and imposed loads are calculated in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003, BS EN 1991-1-4 : 2005 and their UK National Annexes.

4.7 The system is not suitable for direct application to metal decking, which must be overlaid with a suitable flat deck of exterior grade plywood.

4.8 Insulation materials used in conjunction with the system must be:

- as described in the relevant clauses of BS 8217 : 2005 and approved by the Certificate holder, or
- the subject of a current BBA Certificate and used in accordance with and within the limitations of that Certificate, and approved by the Certificate holder.

4.9 For zero pitched roofs it is particularly important to identify the correct drainage system to ensure that it is effective.

4.10 In inverted roof specifications the ballast requirements should be calculated in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. Additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs – Drainage and U value corrections*.

5 Practicability of installation

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

6 Weathertightness

6.1 The system will adequately resist the passage of moisture into a structure and enable it to satisfy the requirements of the National Building Regulations.

6.2 The system is impervious to water and will act as a waterproof layer capable of accepting minor structural movement without damage.

7 Properties in relation to fire

7.1 The membrane, when used in protected or inverted roof specifications including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can be considered to be unrestricted under the requirements of the national Building Regulations.

7.2 The designation of other specifications (eg on combustible substrates) should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B, Appendix A, clause A1
Scotland — test to conform to Mandatory Standard 2.8, clause 2.8.1[(1)(2)]
(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).
Northern Ireland — test or assessment by a UKAS-accredited laboratory, BRE or an independent consultant with appropriate experience.

8 Resistance to wind uplift

The system will resist the effects of wind uplift likely to occur in practice.

9 Resistance to mechanical damage

9.1 The system can accept the foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care must be taken to avoid puncture by sharp objects or concentrated loads.

9.2 For areas of pedestrian access, suitable protection must be used in conjunction with the system.

9.3 When used over construction and expansion joints, the system can accommodate the minor structural movement likely to occur in service.

10 Maintenance

10.1 The system must be the subject of twice-yearly inspections and maintenance to ensure continued performance.

10.2 Maintenance should include checks and operations to ensure that, where applicable:

- adequate ballast is in place and evenly distributed over the membrane
- protection layers are in good condition
- unwanted vegetation and other debris are cleared from the roof and drainage outlets.

11 Durability

11.1 Deckmaster System BM meets the heat ageing and water exposure requirements for a life of at least 25 years. In the opinion of the BBA, when fully protected and subjected to normal service conditions, the system can provide an effective barrier to the transmission of liquid water and water vapour for the design life of the roof in which it is incorporated.

11.2 In situations where maintenance or repair to the protection layer are necessary, the durability of the membrane may be reduced. In these circumstances, the Certificate holder should be consulted.

Installation

12 General

12.1 Deckmaster System BM must be installed in accordance with the Certificate holder's instructions and this Certificate.

12.2 Prior to application, checks should be made to ensure that the substrate is dry (ie free from rainwater and surface condensation) and that the prevailing weather and site conditions are correct. The following normal limitations apply:

- the resin components must be stored for at least 24 hours at a temperature of between 10°C and 25°C, to ensure that the mixed resin has the correct application characteristics
- installation must not be carried out if rain is imminent, and uncured layers must be kept dry. The ambient relative humidity must be below 85%
- installation must not take place if the wind speed is above 7 $m \cdot s^{-1}$, unless adequate wind breaks are in place
- the system should not be applied when air or substrate temperatures are outside those recommended by the Certificate holder, unless suitable measures are taken following consultation with the Certificate holder
- the air above the system should be maintained at least 3°C above the dew-point during application and curing.

12.3 Detailing (eg upstands) is carried out in accordance with the Certificate holder's instructions.

13 Site and surface preparation

13.1 Substrates on which the system is to be applied must be properly prepared in accordance with the Certificate holder's instructions.

13.2 Adhesion to substrates will depend on the condition and cleanness of the substrate. Substrates must be visibly dry, smooth, even, sound and free from loose materials or contamination, such as moss, algae, bitumen or oil. In cases of doubt the Certificate holder should be consulted.

Concrete and polymer modified sand/cement screed substrates

13.3 Damaged areas of the substrate, blow holes and low spots must be repaired with a suitable repair compound.

13.4 High spots on the substrate must be removed by grinding.

13.5 Any laitance, surface sealer or curing membrane on the concrete is removed by a suitable method, such as shot-

blasting or grinding.

13.6 For substrates with a relative humidity greater than 75%, priming is carried out using Deckmaster DPM Primer at a minimum rate of 0.4 kg per m^2 using a squeegee and back rolled evenly with a medium-pile roller, avoiding pooling. The primer is allowed to cure prior to installation of the system.

13.7 Deckmaster DPM Primer is a two-part product. The resin component is mixed, prior to addition of hardener, to ensure even distribution, as there is settlement of the resin during storage. The entire contents of the hardener pack is added to the resin and mixed in, using mixing equipment in accordance with the Certificate holder's recommended specification. The resin and hardener must be thoroughly blended to prevent uncured areas in the primer coat.

13.8 For substrates with a relative humidity less than 75%, priming is carried out using Deckmaster PU Primer, applied evenly at a minimum rate of 5 to 10 m^2 per litre using a medium-pile roller, avoiding pooling. The primer is allowed to dry to a tacky film for 40 to 90 minutes, depending on site conditions prior to application of the system.

Timber substrate

13.9 Old or contaminated timber substrates are sanded thoroughly to expose clean wood, and must be dry with a moisture content of less than 5%. If any doubt exists on the quality of the timber or surface preparation, an adhesion test should be carried out.

13.10 The timber is primed using Deckmaster PU Primer, applied evenly at a minimum rate of 5 to 10 m^2 per litre using a medium-pile roller, avoiding pooling. The primer is allowed to dry to a tacky film for 40 to 90 minutes, depending on site conditions prior to application of the system.

14 Application

14.1 Deckmaster Carrier Membrane is applied to the primed substrate and pressed down firmly to ensure even contact between the self-adhesive membrane and the primed surface, avoiding air entrapment. The side laps must be a minimum of 100 mm and end laps a minimum of 150 mm.

14.2 The Deckmaster Membrane resin component is mixed, prior to the addition of the hardener, to ensure even distribution, as there is settlement of the resin during storage. The entire contents of the hardener pack is added to the resin and mixed in, using mixing equipment in accordance with the Certificate holder's recommended specification. The resin and hardener must be thoroughly blended to prevent uncured areas in the final system.

14.3 The first layer of the membrane is applied at a minimum rate of 1.5 kg per m^2 (to give a minimum thickness of 1.5 mm) using either a steel float or squeegee. Additional material may be required on rough or uneven substrates. The coating thickness should be checked regularly during the installation with a wet film gauge.

14.4 Once the first layer is cured, a second layer is applied at a minimum rate of 1.0 kg per m^2 (to give a minimum thickness of 1.0 mm). The Certificate holder's guidance on minimum and maximum overcoating times, which are dependent upon substrate and air temperature, must be followed. If the maximum time is exceeded, the surface of the first coat is lightly abraded using abrasive paper, removing any dust created, to provide a mechanical key for the second coat.

14.5 Where day joints occur, the overlap area is cleaned thoroughly using Pumasolve prior to coating.

14.6 Once the system is cured, a suitable protection layer or inverted roof system is installed over the system in accordance with the Certificate holder's instructions.

14.7 Where the system is to be protected by a cement-based product, such as a sand/cement screed or mortar bed for pavers, an alkali protection layer is applied. The layer is formed by applying a coat of Deckmaster DPM Primer at a rate of between 0.4 kg per m^2 and 0.6 kg per m^2, and fully blinding with Deckmaster 0712 Quartz Sand. Excess sand is removed, prior to installation of the cementitious material following the recommended curing time.

15 Repair

Minor damage to the system can be repaired effectively by cleaning back, as described in section 14.5, and recoating the damaged area.

Technical Investigations

16 Tests

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

- watertightness
- water vapour transmission
- tensile properties
- delamination strength from Deckmaster Carrier Membrane on plywood
- dynamic indentation
- static indentation
- fatigue cycling
- extremes of installation temperature (tensile strength and dynamic indentation repeated)
- heat ageing at 70°C for 200 days (tensile strength, dynamic indentation and fatigue cycling repeated)
- water exposure at 60°C for 180 days (delamination strength and static indentation repeated).

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 the practicability of installation of the system.

Bibliography

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

BS EN 1991-1-1 : 2002 *Eurocode 1 : Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
BS EN 1991-1-3 : 2003 *Eurocode 1 : Actions on structures — General actions — Snow loads*
NA to BS EN 1991-1-3 : 2003 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Snow loads*
BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*

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

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 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.

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