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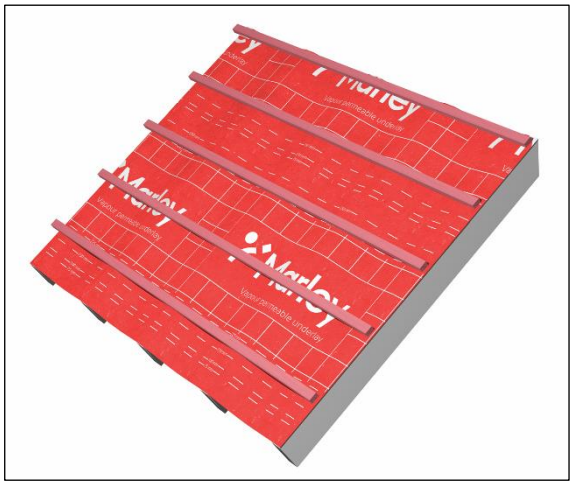
Agrément Certificate
19/5678
Product Sheet 2

MARLEY BREATHABLE UNDERLAYS

MARLEY UNIVERSAL VAPOUR PERMEABLE UNDERLAY FOR USE IN COLD NON-VENTILATED ROOFS

This Agrément Certificate Product Sheet(1) relates to Marley Universal Vapour Permeable Underlay, a roof tile underlay for use in cold non-ventilated pitched roof systems.

(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 — as part of a complete roof, the product will resist the passage of water and wind-blown snow and dust into the interior of the building (see section 6).
Risk of condensation — the product is a low water vapour resistance (Type LR) underlay and can be used as part of cold non-ventilated pitched roof systems (see section 7).
Wind loading — when installed on appropriately spaced battens, the product's physical properties are adequate to resist the wind loads imposed on the underlay. The product will reduce the wind uplift forces acting on the roof covering (see section 8).
Strength — the product has adequate strength to resist the loads associated with installation of the roof (see section 9).
Durability — under the normal conditions found in a roof space, the product will have a service life comparable to traditional roof tile underlays (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

Date of First issue: 25 July 2019

John Albon
Chief Scientific Officer

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.
Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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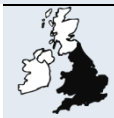
Regulations

In the opinion of the BBA, Marley Universal Vapour Permeable Underlay for use in cold non-ventilated roofs, 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(b)**	**Resistance to moisture**
Comment:		The product will contribute to a roof satisfying this Requirement. See section 6.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The product will enable a roof to satisfy this Requirement with regard to interstitial condensation. See section 7 of this Certificate.
Regulation:	**7**	**Materials and workmanship (applicable to Wales only)**
Regulation:	**7(1)**	**Materials and workmanship (applicable to England only)**
Comment:		The product is an acceptable material. See section 12 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Durability, workmanship and fitness of materials**
Comment:		The product can contribute to a roof satisfying this Regulation. See section 12 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	3.10	Precipitation
Comment:		The product will contribute to a roof satisfying clauses 3.10.1(1)(2) and 3.10.8(1)(2) of this Standard. See section 6.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can enable a roof to satisfy this Standard with respect to interstitial condensation. See section 7 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 the 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 (as amended)

Regulation:	**23(a)(i) (iii)(b)(i)**	**Fitness of materials and workmanship**
Comment:		The product is acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The product will contribute to a roof satisfying this Regulation. See section 6.1 of this Certificate.

Regulation:	**29**	**Condensation**
Comment:		The product can enable a roof to satisfy this Regulation. See section 7 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.1) and 14 *General* (14.2) of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13859-1 : 2014. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Marley Universal Vapour Permeable Underlay for use in cold non-ventilated roofs is a composite structure comprising water vapour permeable film and two layers of nonwoven polypropylene fabrics. The product is also available with integrated tapes for sealing overlaps and has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Marley Universal Vapour Permeable Underlay
Thickness (mm)	0.60
Mass per unit area* ($g \cdot m^{-2}$)	170
Roll length* (m)	50
Roll width* (m)	1.0/1.5
Colour	
upper	red
lower	grey
Tensile strength* (N per 50 mm)	
longitudinal	400
transverse	260
Elongation* (%)	
longitudinal	80
transverse	100
Tear resistance* (N)	
longitudinal	190
transverse	190
Watertightness*	
unaged	W1
aged(1)	W1
Equivalent air layer thickness* – S_d (m)	0.029
Vapour resistance ($MN \cdot s \cdot g^{-1}$)	0.145

(1) Aged in accordance with BS EN 13859-1 : 2014, Annex C.

1.2 The Certificate holder can provide a suitable double-sided tape for taping the overlaps. Alternatively, any suitable proprietary tape compatible with synthetic underlays can be used. Additional guidance can be obtained from the Certificate holder.

2 Manufacture

2.1 The membrane is manufactured by lamination of a water-vapour-permeable film between two layers of non-woven spunbonded polypropylene to form a flexible, vapour-permeable roof tile underlay.

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 Rolls are delivered to site individually wrapped in polythene. A technical leaflet bearing the product name and the BBA logo incorporating the number of this Certificate is included with each roll.

3.2 Rolls should be stored flat or on end on a smooth, clean surface, under cover and protected from sunlight.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Marley Universal Vapour Permeable Underlay for use in cold non-ventilated roofs.

Design Considerations

4 Use

4.1 Marley Universal Vapour Permeable Underlay for use in cold non-ventilated roofs is satisfactory for use in dwellings with non-ventilated tiled or slated roofs of any conventional plan and size. Features(1) assessed include:

- duo pitched
- gable ends
- room-in-roof(2)
- mono-pitched
- verges
- dormers
- hipped
- abutments
- timber sarking(3)
- timber sheathing(4)
- mansard
- valleys.

(1) For roofs incorporating other features, or non-conventional roof geometries or construction materials, the advice of the Certificate holder should be sought.
(2) Where a room-in-the-roof results in part of a roof pitch being insulated (ie a warm roof), design and detailing of that part of the roof should comply with the relevant guidance given in Product Sheet 1 of this Certificate.
(3) As in Scottish practice, where slates are nailed through the breather membrane directly into timber planks (nominally 150 mm wide with a 2 mm gap) without battens.
(4) Timber sarking, tiled roofs: counterbattens of 12 mm minimum thickness should be used to provide a drainage path beneath the tiling battens. The membrane may be laid directly over the timber planks or draped over the counterbattens.

4.2 It is important that the designers, planners, contractors and/or installers ensure that the roof and ceiling are constructed in accordance with the Certificate holder's instructions and the information given in this Certificate.

4.3 The product should be installed by draping over rafters and securing with tiling battens, or installed taut over rafters and secured with counterbattens and tiling battens.

4.4 In conventionally ventilated roof constructions, energy loss by ventilation can account for up to 25% of the total heat lost through the roof. The non-ventilated system will significantly reduce this mechanism of heat loss.

4.5 In non-ventilated roof systems, the risk of condensation is equivalent to, or less than, that for conventionally ventilated cold roof systems (see section 7).

4.6 When used in direct contact with treated timber the advice of the Certificate holder should be sought on compatibility.

5 Practicability of installation

The product is designed to be installed by competent slaters/tilers, experienced with this type of product.

6 Weathertightness

6.1 The product is classified as Class W1* in accordance with BS EN 13859-1 : 2014 and will resist the passage of water and wind-blown snow and dust into the interior of a building under all conditions to be found in a roof constructed in accordance with the relevant clauses of BS 5534 : 2014.

6.2 The product resists the penetration of liquid water and consequently may be used as temporary waterproofing prior to the installation of slates or tiles. The period of such use should, however, be kept to a minimum. Further information is given in BBA Information Bulletin No 2 *Permeable Roof Tile Underlay — Guide to Good Site Practice.*

7 Risk of condensation

7.1 For design purposes, the product's water vapour resistance may be taken as not more than 0.25 $MN \cdot s \cdot g^{-1}$, and for roofs designed in accordance with BS 5534 : 2014 or BS 5250 : 2011 Annex H, it may be regarded as a Type LR membrane.

7.2 The complete roof construction, ceiling boards to roof tiles, must be considered as a total system with regard to condensation risk. It is important that the product is laid in accordance with the Certificate holder's instructions and this Certificate to minimise the risk of condensation.

7.3 The risk of condensation is highest in new-build construction during the first heating period, where there is high moisture loading owing to wet trades, such as in-situ cast concrete slabs or plaster. The risk of condensation diminishes as the building naturally dries out. See BBA Information Bulletin No 1 *Roof Tile Underlays in Cold Roofs during the Drying-out Period*.

7.4 All penetrations into and out of the roof space must be properly sealed in accordance with the Certificate holder's instructions, which include the use of the Certificate holder's recommended sealing tape. In addition, such features as vent stacks and boiler flues passing through the roof space must be sealed.

7.5 It is essential to minimise water vapour transfer into the loft space from the dwelling below. Appropriate measures include:

- ventilating the dwelling below, in accordance with the national Building Regulations and Standards for the dispersal and rapid dilution of water vapour, particularly from rooms that may experience high humidity (such as kitchens, utility rooms and bathrooms)
- covering all water tanks in the loft space and lagging pipework
- sealing penetrations in the ceiling and making loft hatches convection-tight by using a compressible draught seal
- ensuring that there is continuity of jointing with walls (and behind wall linings) at ceiling perimeters
- ensuring that masonry wall cavities do not interconnect with roof cavities.

7.6 For additional protection, the use of a vapour control layer/vapour check plasterboard can be considered.

8 Wind loading

8.1 Project design wind speeds for the roof in which the product is installed should be determined and wind uplift forces calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex.

Unsupported

8.2 The product is satisfactory for use in unsupported systems in the geographical Wind Zones given in Table 2, where a well-sealed ceiling, as defined in BS 9250 : 2007, Clause 3.7, is present and the roof has a ridge height of ≤15 m, a pitch between 12.5 and 75°, and a site altitude of ≤100 m, and where topography is not significant. For all other cases, the required uplift resistance should be determined using BS 5534 : 2014 and the Certificate holder's declared wind uplift resistances in Table 3.

Table 2 Zones of applicability of Marley Universal Vapour Permeable Underlay *with battened laps, taped laps, integrated tapes and with counterbattens , according to BS 5534 : 2014, clause A.8*

≤345 mm batten gauge with battened laps	≤250 mm batten gauge with battened laps	≤345 mm batten gauge with taped laps	≤345 mm batten gauge with integrated taped laps	≤345 mm batten gauge with counterbatten(1)
Zones 1 to 4	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5

(1) This applies to any counterbatten ≥11 mm deep. NHBC does not accept the Wind Zones and wind uplift resistance when using counterbattens on an unsupported roof.

Table 3 Declared wind uplift resistance (Pa)

≤345 mm batten gauge with battened laps(3)	≤250 mm batten gauge with battened laps(2)(3)	≤345 mm batten gauge with taped laps(3)	≤345 mm batten gauge with integrated taped laps(3)	≤345 mm batten gauge with counterbatten(1)(3)
1529	2613	>1600	>1600	>1600

(1) This applies to any counterbatten ≥11 mm deep. NHBC does not accept the Wind Zones and wind uplift resistance when using counterbattens on an unsupported roof.
(2) Underlays with a wind uplift resistance at a 250 mm batten gauge that satisfy the minimum design wind pressure of 820 Pa for Zone 1 are deemed to satisfy the requirements for use at 100 mm batten gauge in all Wind Zones.
(3) Mean of test results.

Supported

8.3 The product, when fully supported, has adequate resistance to wind uplift forces.

8.4 The product may be used at any batten gauge in all Wind Zones when laid over nominally airtight timber sheathing, for example OSB, plywood, chipboard and insulation for warm-roof design. It may also be used in applications where slates are nailed directly onto sarking boards.

8.5 Timber sarking, such as square-edged butt jointed planks, are not considered to be airtight and the underlay is treated as unsupported.

9 Strength

The product will resist the normal loads associated with installation of the roof.

10 Properties in relation to fire

10.1 Marley Universal Vapour Permeable Underlay for use in cold non-ventilated roofs is classified a Class E* in accordance with BS EN 13501-1 : 2002.

10.2 The product will have similar properties in relation to fire to those of traditional polyethylene roof tile underlays.

10.3 When the product is used unsupported, there is a risk that fire can spread if the materials are accidently ignited during maintenance works, eg by a roofer's or plumber's torch. As with all types of underlay, care should be taken during building and maintenance to avoid material being ignited.

10.4 When the product is used in a fully supported situation, the reaction to fire will be primarily determined by the support.

11 Maintenance

As the product is confined within the roof system and has suitable durability (see section 12), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 17).

12 Durability

The product will be virtually unaffected by the normal conditions found in a roof space and will have a life comparable to that of traditional roof tile underlays, provided it is not exposed to sunlight for long periods (see section 14.5). Advice regarding exposure can be obtained from the Certificate holder.

13 Reuse and recyclability

The product contains polypropylene, which can be recycled.

Installation

14 General

14.1 Marley Universal Vapour Permeable Underlay for use in cold non-ventilated roofs must be installed and fixed in accordance with the Certificate holder's instructions, the provisions of this Certificate and the relevant recommendations of BS 5534 : 2014 , BS 8000-0 : 2014 and BS 8000-6 : 2013. Installation can be carried out under all conditions normal to roofing work.

14.2 The product has a high coefficient of friction when dry, giving a slip-resistant surface for increased safety during installation of the covering. During installation, care should be taken in wet conditions owing to the reduced slip resistance.

14.3 The product is installed with the coloured or printed side uppermost and lapped to shed water out and down the slope.

14.4 Overlaps must be provided with the minimum dimensions given in Table 4. The Certificate holder's advice must be sought when using tapes for sealing overlaps.

Table 4 Minimum overlaps

Roof pitch (°)	Horizontal laps (mm) untaped, integrated taped and taped		Vertical laps (mm)
	Not fully supported	Fully supported	
12.5 < 15	225	150	100
≤15	150	100	100

14.5 Where possible, eaves guards should be used to protect the product from sunlight and direct water into the gutter.

15 Procedure

Draped and loose laps

15.1 The product should be installed as an unsupported system and fixed in the traditional method for roof tile underlays, ie draped between the rafters, with the coloured/printed side uppermost.

Timber sheathing

15.2 For fully supported roofs (traditional Scottish), the slates can be nailed through the product into the timber plank sarking, normally 150 mm wide with a 2 mm gap. The underlay must be fixed to the sarking using galvanized clout nails.

15.3 For fully supported roofs (where battens are used), counterbattens of a minimum thickness of 12 mm should be installed either above or beneath the underlay, for drainage purposes.

16 Finishing

16.1 Detailing of abutments, verges and hips must be in accordance with the Certificate holder's instructions.

16.2 To achieve a convection-tight loft space, it is important that the following details are maintained (see also sections 7.4 to 7.6):

- all penetrations, eg pipework, electrical fittings to the loft space, must be sealed
- the loft hatch must be securely sealed to ensure a draught-free fit
- the insulation must be pushed into the eaves and against the underlay to avoid gaps.

16.3 Tiling and slating must be carried out in accordance with the relevant clauses of BS 5534 : 2014, BS 8000-0 : 2014 and BS 8000-6 : 2013 and the tile/slate manufacturer's instructions, especially when using tightly jointed slates or tiles, where a ventilated batten space should be provided.

17 Repair

Damage to the product can be repaired prior to the installation of slates or tiles by patching and sealing the damaged areas. Care must be taken to ensure that the watertightness of the roof is maintained.

Technical Investigations

18 Tests

18.1 An assessment was made of data to BS EN 13859-1 : 2014 in relation to:

- dimensions
- mass per unit area
- tensile strength and elongation
- resistance to tear
- dimensional stability
- resistance to water penetration
- resistance to artificial ageing
- water vapour transmission.

18.2 Tests were carried out to determine:

- slip resistance
- resistance to streaming water
- Mullen burst strength
- resistance to wind loads

in order to assess:

- safety during installation
- performance under typical service conditions
- robustness during installation
- properties when installed.

19 Investigations

19.1 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.

19.2 Using computer modelling, cold non-ventilated roofs were analysed for risk of condensation.

Bibliography

BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*

BS 5534 : 2014 + A2 : 2018 *Slating and tiling for pitched roofs and vertical cladding — Code of practice*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*
BS 8000-6 : 2013 *Workmanship on building sites — Code of practice for slating and tiling of roofs and walls*

BS 9250 : 2007 *Code of practice for design of the airtightness of ceilings in pitched roofs*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*

BS EN 13501-1 : 2002 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

BS EN 13859-1 : 2014 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*

20 Conditions

20.1 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.

20.2 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.

20.3 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.

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

20.5 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.

20.6 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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