WonderBuilds Inc. Ltd
16 Hampden Gurney Street
London W1H 5AL

Tel: 020 8208 2121
e-mail: info@wonderbuilds.co.uk
website: www.wonderbuilds.co.uk

Agrément Certificate
16/5385
Product Sheet 2

WONDERBUILDS BREATHER MEMBRANES

WONDERVENT FOR USE IN COLD NON-VENTILATED ROOFS

This Agrément Certificate Product Sheet(1) relates to WonderVent Breather Membranes, flexible three-layer polypropylene underlays 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 products will resist the passage of water and wind-blown rain and dust into the interior of the building (see section 6).

Risk of condensation — the products are low water vapour resistance (Type LR) underlays and can be used as part of a cold roof system without specific provisions for ventilation (see section 7).

Wind loading — when installed on appropriately spaced battens, the products' physical properties are adequate to resist the wind loads imposed on the underlay. The products will reduce the wind uplift forces acting on the roof covering (see section 8).

Strength — the products have adequate strength to resist the loads associated with the installation of the roof (see section 9).

Durability — under the normal conditions found in a roof space, the products will have a service life comparable to that of a traditional roof tile underlay (see section 12).

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 Second issue: 19 September 2019

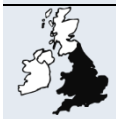
Originally certificated on 21 February 2017

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

Regulations

In the opinion of the BBA, WonderVent Breather Membranes 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 products will contribute to a roof satisfying this Requirement. See section 6.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The products 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 products are acceptable. 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 products 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 products 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 products can enable a roof to satisfy this Standard with regard to interstitial condensation. See section 7 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products can contribute to satisfying 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 products 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 products are acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The products will contribute to a roof satisfying this Regulation. See section 6.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The products will contribute to a roof satisfying 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 section: 1 *Description* of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the products 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

WonderVent Breather Membranes for use in cold non-ventilated roofs are three-layer polypropylene composites with the nominal characteristics and available grades given in Table 1. The membranes are available with or without an integral self-adhesive tape to allow sealing of overlaps. The Certificate holder can provide a suitable single-sided tape for taping the overlaps.

Table 1 Nominal characteristics

Characteristic (unit)	WonderVent Breather Membranes			
	Classic 100	Pro 115	Premier 140	Ultra 160
Thickness (mm)	0.4	0.45	0.6	0.7
Mass per unit area* ($g \cdot m^{-2}$)	100	115	140	160
Roll length* (m)	any	any	any	any
Roll width* (m)	any	any	any	any
Colour				
upper	various	various	various	various
lower	various	various	various	various
Tensile strength* (N per 50 mm)				
longitudinal	260	300	330	350
transverse	170	200	230	240
Elongation* (%)				
longitudinal	70	70	70	70
transverse	70	70	70	70
Tear resistance* (N)				
longitudinal	100	120	130	140
transverse	120	160	200	230
Watertightness*				
unaged	W1	W1	W1	W1
aged(1)	W1	W1	W1	W1
Equivalent air layer thickness* S_d (m)	0.02	0.02	0.02	0.02

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

2 Manufacture

2.1 The membranes are manufactured by thermally bonding two layers of non-woven polypropylene with a micro-porous film between the layers, to form a breathable waterproof membrane.

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 with a label bearing the product name, mass per unit area and the BBA logo incorporating the number of this Certificate.

3.2 The rolls should be stored flat or on end on a clean, level surface and kept under cover.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on WonderVent Breather Membranes for use in cold non-ventilated roofs.

Design Considerations

4 Use

4.1 WonderVent Breather Membranes for use in cold non-ventilated roofs are satisfactory for use as permeable roof tile underlays in dwellings with cold non-ventilated tiled and slated pitched roofs of any conventional plan and size. Features(1) successfully assessed include:

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

(1) For roofs incorporating other features, or unconventional roof geometries or construction materials, the advice of the Certificate holder should be sought.
(2) Where a room-in-roof results in part of a 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) When used in Scottish practice with timber sarking, the membrane is laid over open jointed timber planks (nominally 150 mm wide with a 2 mm gap) and fixed with galvanized clout nails. Slates are nailed through the membrane on the sarking without battens.
(4) When used on other tiled roofs with timber sheathing, 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 sheathing, 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 products can 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 heat loss.

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

5 Practicability of installation

The products are designed to be installed by competent slaters/tilers experienced with these types of products.

6 Weathertightness

6.1 The products are Class W1* in accordance with BS EN 13859-1 : 2014 and will resist the passage of water, 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 products resist 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 2 *Permeable Roof Tile Underlay – Guide to Good Site Practice.*

7 Risk of condensation

7.1 For design purposes, the products' 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, they may be regarded as Type LR membranes.

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 products are 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 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 includes 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 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 products are installed should be determined, and wind uplift forces calculated, by a suitably experienced and competent individual, in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex.

Unsupported

8.2 The products are 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 up to 15 m, a pitch between 12.5 and 75°, and a site altitude up to 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 the WonderVent underlays according to BS 5534 : 2014, Clause A.8, with battened laps, integral and taped laps

Product	≤345 mm batten gauge	≤250 mm batten gauge[1]	≤250 mm batten gauge with integral taped laps	≤345 mm batten gauge with integral taped laps	≤345 mm batten gauge with single-sided taped laps
WonderVent Classic 100	Zone 1	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5
WonderVent Pro 115	Zones 1 to 2	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5
WonderVent Premier 140	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5
WonderVent Ultra 160	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5

(1) 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.

Table 3 Declared wind uplift resistance (Pa)

Product	≤345 mm batten gauge[2]	≤250 mm batten gauge[1][2]	≤250 mm batten gauge with integral taped laps[1][2]	≤345 mm batten gauge with integral taped laps[2]	≤345 mm batten gauge with single-sided taped laps[2]
WonderVent Classic 100	854	1510	—	1828	1828
WonderVent Pro 115	1132	2698	—	2556	2556
WonderVent Premier 140	1761	1914	≤3790	1832	1887
WonderVent Ultra 160	1716	—	—	2826	2826

(1) 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.
(2) Mean of test results.

Supported

8.3 The products, when fully supported, have adequate resistance to wind uplift forces.

8.4 The products 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. They 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 products will resist the loads associated with installation of the roof.

10 Properties in relation to fire

10.1 The products are Class E*[1] in accordance with BS EN 13501-1 : 2007.

(1) Report reference 7/2017, issued by Polish Centre of Testing and Certification. Report is available from the Certificate holder upon request.

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

10.3 When the products are used unsupported, there is a risk that fire can spread if they are accidentally 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 the material being ignited.

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

11 Maintenance

As the products are confined within a roof structure and have suitable durability (see section 12), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 17).

12 Durability

The products will be virtually unaffected by the normal conditions found in a roof space and will have a life comparable with that of a traditional roof tile underlay, provided they are not exposed to sunlight for long periods (see section 14.4). Advice regarding exposure can be obtained from the Certificate holder.

13 Reuse and recyclability

The products contain polypropylene, which can be recycled.

Installation

14 General

14.1 WonderVent Breather Membranes 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 products are installed with the coloured or printed side uppermost and lapped to shed water out and down the slope.

14.3 Overlaps must be provided with the minimum dimensions given in Table 4. It is recommended that vertical joints in the membrane are avoided. Where required, any possible vertical laps should be completed carefully. The edges of both strips of the membrane should be glued together, curled up, and fixed with staples directly to the rafters.

Table 4 Minimum overlaps

Roof pitch (°)	Horizontal Lap – untaped, and integrated taped (double) (mm)		Vertical lap (mm)
	Not fully supported	Fully supported	
12.5 < 15	225	150	100
≥15	150	100	100

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

15 Procedure

Draped and loose laps

15.1 The products can 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.

Taut

15.2 The products should be laid horizontally and must be pulled taut and not allowed to drape. Each sheet should be fixed to hold it in position prior to the counterbattens being fixed. Counterbattens (minimum thickness 25 mm) are then fixed to the rafter.

Timber sheathing

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

15.4 For fully supported roofs (where battens are used) counterbattens of minimum thickness 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 minimise the risk of condensation, it is important that the following details are maintained (see also sections 7.3, 7.5 and 7.6):

- all penetrations, eg pipework and electrical fittings to the loft space, must be sealed
- the loft hatch must be securely sealed with an effective compressible draught seal
- 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, BS 8000-6 : 2013 and the Certificate holder's instructions, especially when using tightly jointed slates or tiles, ie where a ventilated batten space should be provided.

17 Repair

Damage to the products can be repaired prior to the installation of slates or tiles by replacing the damaged areas by patching and sealing correctly. Care should 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
- reaction to fire.

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 : 2007 *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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk