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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
10/4748
Product Sheet 2

CROMAR ROOF TILE UNDERLAYS

CROMAR BREATHABLE MEMBRANES FOR USE IN COLD NON-VENTILATED PITCHED ROOF SYSTEMS

This Agrément Certificate Product Sheet(1) relates to Cromar Breathable Membranes, three-layer polyolefin composite sheet materials for use as roof tile underlays 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 — when used as part of a complete roof, the products 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 products are low water vapour resistance (Type LR) underlays and can be used as part of a cold non-ventilated pitched roof system (see section 7).

Wind loading — when installed on appropriately spaced battens, the products' physical properties are deemed 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 traditional roof tile underlays (see section 12).

The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 23 April 2014
Originally certificated on 21 Apriil 2010

Simon Wroe
Head of Approvals — Materials

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, Cromar Breathable Membranes for use in Cold Non-Ventilated Pitched Roof Systems, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting 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 meeting this Requirement. See section 6.1 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The products will contribute to a roof meeting this Requirement with respect to interstitial condensation. See section 7 of this Certificate.
Regulation:	7	Materials and workmanship
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 construction 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 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 these 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

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 can enable a roof to satisfy this Regulation. See section 7 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 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 : 2010. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

Cromar Breathable Membranes for use in Cold Non-ventilated Pitched Roof Systems are three-layer polyolefin composites and are available in four types with the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Membrane type			
	Vent 3 Light	Vent 3 Classic	Vent 3	Vent 3 PRO
Thickness (mm)	0.40	0.43	0.50	0.65
Mass per unit area* ($g \cdot m^{-2}$)	95	115	135	165
Roll length* (m)	50, 45, 25, 15	50, 45, 25, 15	50, 45, 25, 15	50, 45,25,15
Roll width* (m)[1]	1.0, 1.5	1.0, 1.5	1.0, 1.5	1.0, 1.5
Colour				
upper	dark grey	light grey	dark blue	dark green
lower	white	white	white	white
Tensile strength* (N per 50 mm)				
longitudinal	176	195	266	320
transverse	109	130	184	270
Elongation* (%)				
longitudinal	63	51	74	80
transverse	70	65	97	100
Tear resistance* (N)				
longitudinal	92	99	167	290
transverse	126	110	253	270
Watertightness*				
unaged	W1	W1	W1	W1
aged[1]	W1	W1	W1	W1
Water vapour transmission* (S_d)(m)	0.02	0.02	0.02	0.02

(1) Aged in accordance with BS EN 13859-1 : 2010, Annex C.

2 Manufacture

2.1 The membrane is manufactured by a lamination of a water vapour permeable film between two layers of non-woven polypropylene spunbond 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 operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 Rolls are delivered in packages carrying a label bearing the marketing company's name, the grade identification and the BBA logo incorporating the number of this Certificate.

3.2 Rolls should be stored flat on their sides on a smooth, clean, dry surface and under cover protected from sunlight.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Cromar Breathable Membranes for use on Cold Non-ventilated Pitched Roof Systems.

Design Considerations

4 Use

4.1 Cromar Breathable Membranes for use on Cold Non-ventilated Pitched Roof Systems are satisfactory for use in dwellings with non-ventilated 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][4]
- mansard
- valleys.

(1) For roofs incorporating other features, non-conventional 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 roof pitch being insulated (ie a warm roof), design and detailing of that part of the roof should comply with relevant guidance given in Product Sheet 1.

(3) As in Scottish practice, where slates are nailed through the underlay directly into timber planks (nominally 150 mm wide with a 2 mm gap) without battens.

(4) In roofs with tiles on timber sarking, counter battens should have a minimum thickness of 12 mm.

4.2 It is important that 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 counter battens 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 subsequently 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).

5 Practicability of installation

The products are designed to be installed by competent roofers/tilers experienced with this type of product.

6 Weathertightness

6.1 The products are classified as W1* in accordance with BS EN 13859-1 : 2010 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 : 2003.

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 No 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 : 2003 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 concrete slabs or plaster. The risk of condensation diminishes as the building naturally dries out. Further information is given in *BBA Information Bulletin No 2 — Permeable Roof Tile Underlay — Guide to Good Site Practice.*

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 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 that from rooms which 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 should be determined and wind uplift forces calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex.

8.2 When fully supported, the products have adequate resistance to wind uplift forces.

8.3 For an unsupported system, wind loading on the underlay should be calculated in accordance with BS 5534 : 2003, section 5.5.2.7. Acceptable wind loads with specific batten spacings for the draped product, using a 25 mm deep tiling batten, are given in Table 2.

Table 2 Resistance to wind loads

Batten spacing (mm)	Maximum pressure (kPa)			
	Vent 3 Light	Vent Classic	Vent 3	Vent 3 PRO
350	–	0.5	0.5	1.0
330	0.5	0.5	0.5	1.0
300	0.5	0.5	1.0	2.0
250	1.0	1.5	1.5	2.0
200	2.0	2.5	2.5	2.5

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 to Class E* in accordance with BS EN 13501-1 : 2007.

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 ignition.

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

11 Maintenance

As the products are confined within a roof system and have suitable durability (see section 12), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 16).

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 traditional roof tile underlays, provided they are not exposed to sunlight for long periods (see section 14.5). Advice on exposure can be obtained from the Certificate holder.

13 Reuse and recyclability

The product comprises polyolefins, which can be recycled.

Installation

14 General

14.1 Cromar Breathable Membranes for use on Cold Non-ventilated Pitched Roof Systems 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 : 2003 and BS 8000-6 : 1990. Installation can be carried out under all conditions normal to roofing work.

14.2 The products are installed with the coloured 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 3.

Table 3 Minimum overlaps

Roof pitch (°)	Horizontal lap (mm)		Vertical lap (mm)
	Not fully supported	Fully supported	
12.5 to 14	225	150	100
15 to 34	150	100	100
35+	100	75	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 should be installed as an unsupported system and fixed in the traditional method for roof tile underlays (ie draped between rafters), with the coloured side uppermost.

Taut

15.2 The products are laid horizontally and must be pulled taut and not allowed to drape. Each sheet must be fixed to hold it in position prior to the counter battens being fixed. Counter battens (minimum thickness 12 mm) are fixed to the rafter.

Timber plank sarking

15.3 For fully supported roofs (traditional Scottish practice), the slates can be nailed through the underlay into the timber plank sarking, normally 150 mm wide with a 2 mm gap.

16 Repair

Damage to the products can be repaired easily prior to the installation of slates or tiles by replacing the damaged areas by patching or sealing correctly. Care should be taken to ensure that the watertightness of the roof is maintained.

17 Finishing

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

17.2 To achieve a convection-tight loft space, it is important that certain details are maintained (see also sections 7.3 to 7.5):

- all penetrations, eg pipework and 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.

17.3 The tiling and slating must be carried out in accordance with the relevant clauses of BS 5534 : 2003, BS 8000-6 : 1990 and the Certificate holder's instructions, especially when using tightly-jointed slates or tiles.

Technical Investigations

18 Tests

18.1 An assessment was made on data to BS EN 13859-1 : 2010 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

to assess:

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

19 Investigations

19.1 Using computer modelling, an analysis was made of the risk of condensation in cold non-ventilated roofs.

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

Bibliography

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

BS 5534 : 2003 *Code of practice for slating and tiling (including shingles)*

BS 8000-6 : 1990 *Workmanship on building sites — Code of practice for slating and tiling of roofs and claddings*

BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions*
NA to BS EN 1991-1-4 : 2005 *UK National Annex to Eurocode 1: Actions on structures — General 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 : 2010 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*

Conditions of Certification

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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