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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
No 07/4431

ROFATOP BREATHER MEMBRANES

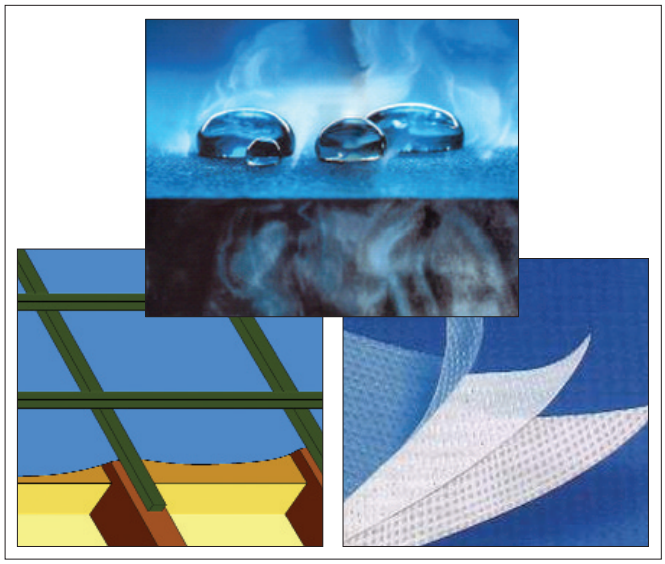
PRODUCT SHEET 1 — FOR USE IN WARM NON-VENTILATED AND COLD VENTILATED ROOFS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Rofatop Breather Membranes for use in warm non-ventilated and cold ventilated pitched roof systems.

THIS CERTIFICATE INCLUDES:

- factors relating to compliance with UK 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, wind-blown snow and dust into the interior of the building (see section 4).

Risk of condensation — the products can be regarded as a low water vapour resistance (Type LR) underlay and can be used as part of a non-ventilated warm and ventilated cold, roof system (see section 5).

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 6).

Strength — the products have adequate strength to resist the loads associated with the installation of the roof (see section 7).

Durability — under the normal conditions found in a roof space the products will have a service life comparable to a traditional roof tile underlay (see section 9).

The BBA has awarded this Agrément Certificate for Rofatop Breather Membranes to Comptoir du Bâtiment NV as fit for their intended use provided they are installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Date of First issue: 23 April 2007

Greg Cooper: Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Rofatop Breather Membranes, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	C2(b)	Resistance to moisture
Comment:		The products will contribute to a roof meeting this Requirement. See sections 4.1 and 4.2 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable materials. See section 9 of this Certificate.

The Building (Scotland) Regulations 2004

Regulation:	8	Fitness and durability of materials and workmanship
Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The products can contribute to a construction satisfying this Regulation. See section 9 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	3.10	Precipitation
Comment:		The products will contribute to a roof satisfying clauses 3.10.1[1][2] and 3.10.7[1][2] of this Standard. See sections 4.1 and 4.2 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for these products under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1[1][2] and Schedule 6[1][2].
		(1) Technical Handbook (Domestic).
		(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable materials. See section 9 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The products will contribute to a roof satisfying this Regulation. See sections 4.1 and 4.2 of this Certificate.

Construction (Design and Management) Regulations 2007
Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

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

See section: 1 *Description* (1.2).

Non-regulatory Information

NHBC Standards 2005

NHBC accepts the use of Rofatop Breather Membranes, when installed and used in accordance with this Certificate, in relation to NHBC Standards, Chapter 7.2 *Pitched roofs*.

Zurich Building Guarantee Technical Manual 2006

In the opinion of the BBA, Rofatop Breather Membranes, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *Pitched roofs*.

General

This Certificate relates to Rofatop Breather Membranes for use as a vapour permeable roof tile underlay in warm non-ventilated and cold ventilated pitched roof systems.

The products will also prevent the ingress of wind-blown rain or snow.

Technical Specification

1 Description

1.1 Rofatop Breather Membranes are thermally-bonded film laminate composites made of polyolefins.

1.2 The products have the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (units)	Rofatop 115	Rofatop 135
Thickness (mm)	0.4	0.5
Weight per unit area (gm^{-2})	122	142
Roll length (m)	50	50
Roll width (m)	1, 1.5, 3	1, 1.5, 3
Colour		
upper	blue	blue
lower	white	white

1.3 Quality control checks are carried out on the incoming materials, during production and on the finished product. Quality control checks on the finished product include:

- weight
- tensile strength and elongation
- water penetration
- water vapour permeability
- tear strength

2 Delivery and site handling

2.1 Rolls are delivered to site in packages that carry a label bearing the marketing company's name, the grade identification and the BBA identification mark including the number of this Certificate.

2.2 The rolls should be stored flat on their sides, on a smooth, clean, dry 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 Rofatop Breather Membranes.

Design Considerations

3 Use

Rofatop Breather Membranes are satisfactory for use as fully supported or unsupported underlays in tiled and slated pitched roofs constructed in accordance with the relevant clauses of BS 5534 : 2003.

4 Weathertightness

4.1 Tests indicate that the products 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.

4.2 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. Advice should be sought from the Certificate holder (see section 14, Table for *Service performance*).

5 Risk of condensation

5.1 For design purposes, the products' water vapour resistance may be taken as not more than 0.25 $MNsg^{-1}$ and for roofs designed in accordance with BS 5534 : 2003 or BS 5250 : 2002, Section 8.4, it may be regarded as a Type LR membrane.

5.2 In common with all roofs, care must be taken in the overall design and installation to minimise the risk of water vapour coming into contact with cold parts of the construction. Factors to be considered and minimised include, moisture diffusion through the ceiling, infiltration through unsealed openings/penetrations in the ceiling and services evaporating or venting moisture into cold spaces.

5.3 The risk of condensation is highest in new-build construction during the first heating period, where there is high moisture loading due 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.*

Ceiling and insulation horizontal (cold roof)

5.4 Roofs designed and constructed in accordance with BS 5250 : 2002 will adequately limit the risk of interstitial condensation.

Ceiling and insulation inclined (warm roof)

5.5 For roofs with an insulated inclined ceiling, ventilation above or below the underlay will not be required provided that the passage of moisture by diffusion and by convection is controlled, eg, by a vapour control layer or a continuous envelope of insulation with a high vapour resistance.

Ceiling and insulation partially inclined (warm roof and cold roof)

5.6 Where an insulated ceiling only spans part of the roofline, resulting cold roof spaces should be ventilated in accordance with BS 5250 : 2002, Sections 8.4.2.5 and 8.4.2.6.

6 Wind loading

6.1 Project design wind speeds should be determined and wind uplift forces calculated, in accordance with BS 6399-2 : 1997.

6.2 The products, when fully supported, has adequate resistance to wind uplift forces.

6.3 For a cold ventilated system, wind loading on the underlay should be calculated in accordance with BS 5534 : 2003, Section 5.5.2.7 (see section 14, Table for *Service performance,* for acceptable wind loads with specific batten spacings for the draped product, using a 25 mm deep tiling batten).

7 Strength

The products will resist the loads associated with installation of the roof (see section 14, Table for *Physical properties — directional*).

8 Properties in relation to fire

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

8.2 When the products are used unsupported, there is a risk that fire can spread if the materials 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 becoming ignited.

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

9 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 10.4). Advice regarding exposure can be obtained from the Certificate holder.

Installation

10 General

10.1 Rofatop Breather Membranes must be installed and fixed in accordance with the Certificate holder's instructions, provisions of this document 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.

10.2 The products are installed with the coloured or printed side uppermost and lapped to shed water out and down the slope.

10.3 Overlaps must be provided with the minimum dimensions given in Table 2.

Table 2 Minimum overlaps

Roof pitch (°)	Horizontal lap (mm)		Vertical laps (mm)
	Not fully supported	Fully supported	
12.5 to 14	225	150	100
15 to 34	150	100	100
35+	100	75	100

10.4 In closed eaves constructions, eaves guards should be used to protect the product from sunlight and direct water into the gutter.

10.5 Hips should be covered with a 600 mm wide strip of the product.

11 Procedure

Fully supported

11.1 The products may be used over sarking boards of softwood, C4 grade chipboard or water-resistant grade plywood or water-resistant grade OSB and either with continuous insulation or insulation placed between the rafters.

11.2 The products are secured to the support with counter battens as least 12 mm thick to create an air space between the product and the tiles for drainage and vapour dispersal. The counter battens are fixed with corrosion-resistant staples or galvanized clout nails as appropriate. Tiling battens are secured to the counter battens and support fixings.

11.3 Care must be taken to minimise the risk of interstitial condensation as described in section 5.5 particularly for timber sarking which may be below the dew-point for extended periods during winter months.

Unsupported

11.4 The products, when installed as an unsupported system, is fixed in the traditional method for roof tile underlays, ie draped between the rafters.

12 Repair

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

13 Finishing

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

13.2 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

14 Tests

Samples of Rofatop Breather Membranes were obtained from the Certificate holder for testing. The results of the tests carried out by, or on behalf of, the BBA are summarised in Tables 3 and 4.

Table 3 Physical properties — directional

Test (units)	Mean result		Method[1]
	Rofatop 115	Rofatop 135	
Tensile strength (N per 50 mm)			BS EN 12311-1
unaged			
long[2]	260	247	
trans[3]	175	197	
aged[4]			
long[2]	—	179	
trans[3]	—	147	
wet strength[5]			
long[2]	—	240	
trans[3]	—	205	
Elongation at break (%)			BS EN 12311-1
unaged			
long[2]	43	34	
trans[3]	73	68	
heat aged[4]			
long[2]	—	36	
trans[3]	—	39	
wet strength[5]			
long[2]	—	53	
trans[3]	—	66	
Tear resistance (nail) (N)			BS EN 12310-1
unaged			
long[2]	143	194	
trans[3]	159	260	

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/ parts of the various documents.

(2) Longitudinal direction.

(3) Transverse direction.

(4) UVA aged for 336 hours at 50°C/heat aged for 90 days at (70±2)°C.

(5) Wet strength soak at 23°C for 24 hours — tested surface wet.

Table 4 Service performance

Test (units)	Mean result		Method[1]
	Rofatop 115	Rofatop 135	
Water vapour permeability at 25°C/75% RH ($gm^{-2}day^{-1}$)	1065	1112	BS 3177
Vapour resistance ($MNsg^{-1}$)	0.19	0.18	BS 3177
Dimensional stability (%)			BS EN 1107-2
long[2]	—	–1.7	
trans[3]	—	0.2	
Slip resistance (coefficient of friction)			T1/10[4]
dry	—	0.9	
wet	—	0.7	
Resistance to water penetration			EN 1928[5]
unaged	Class W1	—	
aged[6]	Class W1	—	
Resistance to streaming water			MOAT 69 : 4.2.2
supported	pass	pass	
unsupported	—	pass	
Mullen burst strength (kNm^{-2})	452	536	BS 3137
Head of water (cm)	577	553	BS EN 20811
Resistance to wind loads (kPa)[7]			MOAT 69 : 4.2.1
batten spacing 350 mm	0.5	0.5	
batten spacing 330 mm	0.5	0.5	
batten spacing 300 mm	1.0	1.0	
batten spacing 250 mm	2.0	2.5	
batten spacing 200 mm	2.5	—	

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

(2) Longitudinal direction.

(3) Transverse direction.

(4) BBA Test Method.

(5) As modified in accordance with EN 13859-1 : 2005.

(6) UVA aged for 336 hours at 50°C/heat aged for 90 days at (70±2)°C.

(7) Test carried out using 25 mm thick battens and a 600 mm rafter spacing.

15 Investigations

15.1 The condensation risk in warm roof constructions, and specifically those containing sarking boards, incorporating the products were examined.

15.2 The manufacturing process was assessed, including the method adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 3137 : 1972 *Methods for determining the bursting strength of paper and board*

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

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

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

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

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

BS EN 1107-2 : 2001 *Flexible sheets for waterproofing — Determination of dimension stability — Plastic and rubber sheets for roof waterproofing*

BS EN 12310-1 : 2000 *Flexible sheets for waterproofing — Determination of resistance to tearing (nail shank) — Bitumen sheets for roof waterproofing*

BS EN 12311-1 : 2000 *Flexible sheets for waterproofing — Determination of tensile properties — Bitumen sheets for roof waterproofing*

BS EN 20811 : 1992 *Textiles — Determination of resistance to water penetration — Hydrostatic pressure test*

EN 1928 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*

EN 13859-1 : 2005 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*

MOAT No 69 : 2004 *UEAtc Technical Report for the Assessment of Discontinuous Roofing Underlay Systems*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

16.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

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

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

16.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
No 07/4431

ROFATOP BREATHER MEMBRANES

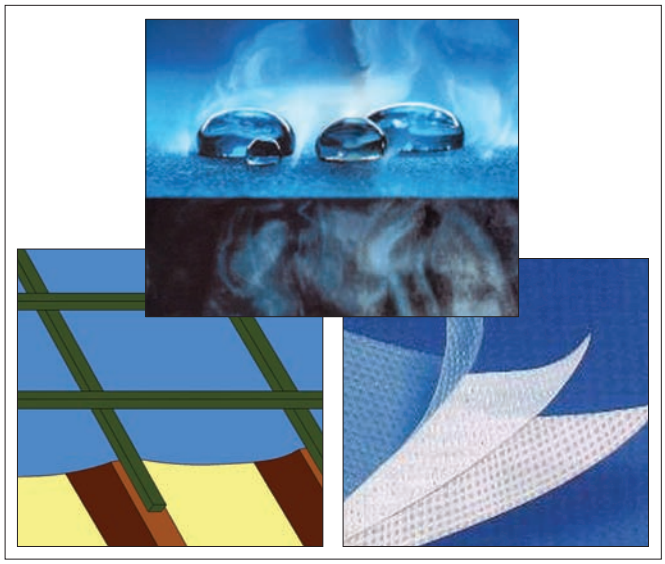
PRODUCT SHEET 2 — FOR USE IN COLD NON-VENTILATED ROOFS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Rofatop Breather Membranes for use in cold non-ventilated pitched roof systems.

THIS CERTIFICATE INCLUDES:

- factors relating to compliance with UK 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, wind-blown snow and dust into the interior of the building (see section 4).

Risk of condensation — the products can be regarded as a low water vapour resistance (Type LR) underlay and can be used as part of a cold roof system without specific provisions for ventilation (see section 5).

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 6).

Strength — the products have adequate strength to resist the loads associated with the installation of the roof (see section 7).

Durability — under the normal conditions found in a roof space the products will have a service life comparable to a traditional roof tile underlay (see section 9).

The BBA has awarded this Agrément Certificate for Rofatop Breather Membranes to Comptoir du Bâtiment NV as fit for their intended use provided they are installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Date of First issue: 23 April 2007

Greg Cooper: Chief Executive

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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.

Regulations

In the opinion of the BBA, Rofatop Breather Membranes, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	C2(b)	Resistance to moisture
Comment:		The products will contribute to a roof meeting this Requirement. See sections 4.1 and 4.2 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The products will enable a roof to meet this Requirement with respect to interstitial condensation. See sections 5.1 to 5.6 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable materials. See section 9 of this Certificate.

The Building (Scotland) Regulations 2004

Regulation:	8	Fitness and durability of materials and workmanship
Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The products can contribute to a construction satisfying this Regulation. See section 9 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	3.10	Precipitation
Comment:		The products will contribute to a roof satisfying clauses 3.10.1[1][2] and 3.10.7[1][2] of this Standard. See sections 4.1 and 4.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		The products can enable a roof to satisfy this Standard with respect to interstitial condensation. See sections 5.1 to 5.6 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for these products under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1[1][2] and Schedule 6[1][2].

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable materials. See section 9 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The products will contribute to a roof satisfying this Regulation. See sections 4.1 and 4.2 of this Certificate.
Regulation:	C5	Condensation
Comment:		The products can enable a roof to satisfy this Regulation. See sections 5.1 to 5.6 of this Certificate.

Construction (Design and Management) Regulations 2007
Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

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

See section: 1 *Description* (1.2).

Non-regulatory Information

NHBC Standards 2005

NHBC accepts the use of Rofatop Breather Membranes, when installed and used in accordance with this Certificate, as meeting Technical Requirement R3 in relation to NHBC Standards, Chapter 7.2 *Pitched roofs*.

Zurich Building Guarantee Technical Manual 2006

In the opinion of the BBA, Rofatop Breather Membranes, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *Pitched roofs*.

General

This Certificate relates to Rofatop Breather Membranes for use as a vapour permeable roof tile underlay in cold non-ventilated pitched roof systems.

The products will also prevent the ingress of wind-blown rain or snow.

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.

Technical Specification

1 Description

1.1 Rofatop Breather Membranes are thermally-bonded film laminate composites made of polyolefins.

1.2 The products have the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (units)	Rofatop 115	Rofatop 135
Thickness (mm)	0.4	0.5
Weight per unit area (gm^{-2})	122	142
Roll length (m)	50	50
Roll width (m)	1, 1.5, 3	1, 1.5, 3
Colour		
upper	blue	blue
lower	white	white

1.3 Quality control checks are carried out on the incoming materials, during production and on the finished product. Quality control checks on the finished product include:

- weight
- tensile strength and elongation
- water penetration
- water vapour permeability
- tear strength

2 Delivery and site handling

2.1 Rolls are delivered to site in packages that carry a label bearing the marketing company's name, the grade identification and the BBA identification mark including the number of this Certificate.

2.2 The rolls should be stored flat on their sides, on a smooth, clean, dry 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 Rofatop Breather Membranes.

Design Considerations

3 Use

Rofatop Breather Membranes are satisfactory for use in dwellings with non-ventilated tiled or slated roofs of any conventional plan and of any size. Features[1] successfully assessed include:

- duo pitched
- mono-pitched
- hipped
- mansard
- gable ends
- verges
- abutments
- valleys
- room in roof
- dormers
- timber sarking[2]

(1) For roofs incorporating other features, non-conventional roof geometries or construction materials, the advice of the Certificate holder should be sought.

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

3.2 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.

3.3 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.

3.4 In non-ventilated roof systems, the risk of condensation is equivalent to, or less than, that for conventionally-ventilated cold roof systems (see section 5).

4 Weathertightness

4.1 Tests indicate that Rofatop Breather Membranes 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.

4.2 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. Advice should be sought from the Certificate holder (see section 14, Table for *Service performance*).

5 Risk of condensation

5.1 For design purposes, the products' resistance to water vapour transmission may be taken as not more than 0.25 $MNsg^{-1}$, and for roofs designed in accordance with BS 5534: 2003 or BS 5250: 2002, Section 8.4, it may be regarded as a Type LR membrane.

5.2 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.

5.3 The risk of condensation is highest in new-build construction during the first heating period, where there is high moisture loading due 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*.

5.4 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.

5.5 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.

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

6 Wind loading

6.1 Project design wind speeds should be determined and wind uplift forces calculated, in accordance with BS 6399-2 : 1997.

6.2 For a cold ventilated system, wind loading on the underlay should be calculated in accordance with BS 5534 : 2003, Section 5.5.2.7 (see section 14, Table for *Service performance,* for acceptable wind loads with specific batten spacings for the draped product, using a 25 mm deep tiling batten).

7 Strength

The products will resist the loads associated with installation of the roof (see section 14, Table for *Physical properties — directional).*

8 Properties in relation to fire

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

8.2 When the products are used unsupported, there is a risk that fire can spread if the materials 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 becoming ignited.

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

9 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 10.4). Advice regarding exposure can be obtained from the Certificate holder.

Installation

10 General

10.1 Rofatop Breather Membranes must be installed and fixed in accordance with the Certificate holder's instructions, provisions of this document 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.

10.2 The products are installed with the coloured or printed side uppermost and lapped to shed water out and down the slope.

10.3 Overlaps must be provided with the minimum dimensions given in Table 2.

Table 2 Minimum overlaps

Roof pitch (°)	Horizontal lap (mm)		Vertical laps (mm)
	Not fully supported	Fully supported	
12.5 to 14	225	150	100
15 to 34	150	100	100
35+	100	75	100

10.4 In closed eaves constructions, eaves guards should be used to protect the products from sunlight, and to direct water into the gutter.

10.5 Hips should be covered with a 600 mm wide strip of the product.

11 Procedure

Draped and loose laps

11.1 The products 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.

Taut

11.2 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 counter battens being fixed. Counter battens (minimum thickness 12 mm) are then fixed to the rafter.

Timber plank sarking

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

12 Repair

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

13 Finishing

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

13.2 To achieve a convection-tight loft space, it is important that the following details are maintained (see also section 5.5).

- 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.

13.3 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

14 Tests

Samples of Rofatop Breather Membranes were obtained from the Certificate holder for testing. The results of the tests carried out by, or on behalf of, the BBA are summarised in Tables 3 and 4.

15 Investigations

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

15.2 The manufacturing process was assessed, including the method adopted for quality control, and details were obtained of the quality and composition of the materials used.

Table 3 Physical properties — directional

Test (units)	Mean result		Method[1]
	Rofatop 115	Rofatop 135	
Tensile strength (N per 50 mm)			BS EN 12311-1
unaged			
long[2]	260	247	
trans[3]	175	197	
aged[4]			
long[2]	—	179	
trans[3]	—	147	
wet strength[5]			
long[2]	—	240	
trans[3]	—	205	
Elongation at break (%)			BS EN 12311-1
unaged			
long[2]	43	34	
trans[3]	73	68	
aged[4]			
long[2]	—	36	
trans[3]	—	39	
wet strength[5]			
long[2]	—	53	
trans[3]	—	66	
Tear resistance (nail) (N)			BS EN 12310-1
unaged			
long[2]	143	194	
trans[3]	159	260	

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

(2) Longitudinal direction.

(3) Transverse direction.

(4) UVA aged for 336 hours at 50°C/heat aged for 90 days at (70±2)°C.

(5) Wet strength soak at 23°C for 24 hours — tested surface wet.

Table 4 Service performance

Test (units)	Mean result		Method[1]
	Rofatop 115	Rofatop 135	
Water vapour permeability at 25°C/75% RH ($gm^{-2}day^{-1}$)	1065	1112	BS 3177
Vapour resistance ($MNsg^{-1}$)	0.19	0.18	BS 3177
Dimensional stability (%)			BS EN 1107-2
long[2]	—	–1.7	
trans[3]	—	0.2	
Slip resistance (coefficient of friction)			T1/10[4]
dry	—	0.9	
wet	—	0.7	
Resistance to water penetration			EN 1928[5]
unaged	Class W1	—	
aged[6]	Class W1	—	
Resistance to streaming water			MOAT 69 : 4.2.2
supported	pass	pass	
unsupported	—	pass	
Mullen burst strength (kNm^{-2})	452	536	BS 3137
Head of water (cm)	577	553	BS EN 20811
Resistance to wind loads (kPa)[7]			MOAT 69 : 4.2.1
batten spacing 350 mm	0.5	0.5	
batten spacing 330 mm	0.5	0.5	
batten spacing 300 mm	1.0	1.0	
batten spacing 250 mm	2.0	2.5	
batten spacing 200 mm	2.5	—	

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

(2) Longitudinal direction.

(3) Transverse direction.

(4) BBA Test Method.

(5) As modified in accordance with EN 13859-1 : 2005.

(6) UVA aged for 336 hours at 50°C/heat aged for 90 days at (70±2)°C.

(7) Test carried out using 25 mm thick battens and a 600 mm rafter spacing.

.Bibliography

BS 3137 : 1972 *Methods for determining the bursting strength of paper and board*

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

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

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

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

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

BS EN 1107-2 : 2001 *Flexible sheets for waterproofing — Determination of dimension stability — Plastic and rubber sheets for roof waterproofing*

BS EN 12310-1 : 2000 *Flexible sheets for waterproofing — Determination of resistance to tearing (nail shank) — Bitumen sheets for roof waterproofing*

BS EN 12311-1 : 2000 *Flexible sheets for waterproofing — Determination of tensile properties — Bitumen sheets for roof waterproofing*

BS EN 20811 : 1992 *Textiles — Determination of resistance to water penetration — Hydrostatic pressure test*

EN 1928 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*

EN 13859-1 : 2005 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*

MOAT No 69 : 2004 *UEAtc Technical Report for the Assessment of Discontinuous Roofing Underlay Systems*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

16.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

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

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

16.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

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