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Agrément Certificate
08/4548
Product Sheet 1

TYVEK ROOF LINING SYSTEMS

TYVEK SUPRO ROOF TILE UNDERLAY FOR USE IN WARM NON-VENTILATED AND COLD VENTILATED ROOFS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to TYVEK⁽¹⁾ Supro Roof Tile Underlay for use in warm non-ventilated and cold ventilated roofs. The use of the product in cold non-ventilated systems is covered in Product Sheet 2.

(1) TYVEK is a registered trademark of E.I. du Pont de Nemours & Co or its affiliates.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

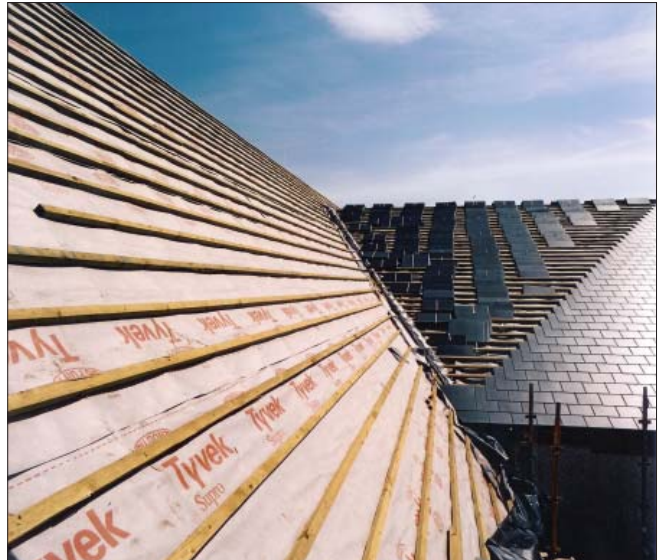
Weathertightness — as part of a complete roof, the product will resist the passage of water and wind-blown snow and dust into the interior of the building (see section 6).

Risk of condensation — the product 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 7).

Wind loading — when installed on appropriately spaced battens and/or rafters the product's physical properties are deemed adequate to resist the wind loads imposed on the underlay. The product will reduce the wind uplift forces acting on the roof covering (see section 8).

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

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



The BBA has awarded this Agrément Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Simon Wroe
Head of Approvals — Materials

Greg Cooper
Chief Executive

Date of Second issue: 31 May 2012

Originally certificated on 8 April 2008

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, TYVEK Supro Roof Tile Underlay, 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 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)

Requirement:	C2(b)	Resistance to moisture
Comment:		The product will contribute to a roof meeting this Requirement. See section 6.1 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The product can contribute to a construction satisfying this Regulation. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	3.10	Precipitation
Comment:		The product will contribute to a roof satisfying clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ of this Standard. See section 6.1 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 – conversions
Comment:		Comments made in relation to this product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



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

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		The product will contribute to a roof satisfying this Regulation. See section 6.1 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* (1.2) of this Certificate.

Additional Information

NHBC Standards 2011

NHBC accepts the use of TYVEK Supro Roof Tile Underlay, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.2 *Pitched roofs*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with EN 13859-1 : 2010. An asterisk (*) appearing in this Certificate indicates that data shown has been taken from the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 TYVEK Supro Roof Tile Underlay is vapour permeable, high-density polyethylene (PE-HD) backed with a polypropylene scrim. The product is available with or without an integral adhesive tape (with tape known as TYVEK Supro Plus).

1.2 The product has the nominal characteristics of:

Thickness (mm)	0.45
Mass per unit area* ($\text{g}\cdot\text{m}^{-2}$)	145
Roll length (m)	50
Roll width (m)	1.0, 1.5
Water vapour transmission – s_d^* (m)	0.015
Watertightness*	
unaged	Class W1
aged ⁽¹⁾	Class W1
Tensile strength* (N per 50 mm)	
longitudinal	300
transverse	240
Nail tear* (N)	
longitudinal	180
transverse	205
Colour	white underside/grey top side and red logo.

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

1.3 Air and Vapour Control Layers (AVCLs) can be used in conjunction with this product. See Product Sheets 3 and 4.

1.4 TYVEK Eaves Carrier is an eaves guard used to protect the exposed underlay edge.

2 Manufacture

2.1 The membrane is manufactured by spinning strands of PE-HD and bonding them together with heat and pressure to form a flexible sheet. A polypropylene scrim is glued to one side of the TYVEK 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 operated by the manufacturer are being maintained.

2.3 The management system of DuPont de Nemours (Luxembourg) S.à r.l. has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by DQS GmbH (Certificate 463950 QM08).

3 Delivery and site handling

3.1 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.

3.2 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 TYVEK Supro Roof Tile Underlay for use in warm non-ventilated and cold ventilated roofs.

4 Use

The product is satisfactory for use as a fully supported or unsupported (draped) underlay over counter batten specifications in tiled and slated pitched roofs constructed in accordance with the relevant Clauses of BS 5534 : 2003.

5 Practicability of installation

Installation can be carried out readily by slaters/tilers experienced with this type of product.

6 Weathertightness



6.1 Results of tests indicate that the product 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 product resists 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.

7 Risk of condensation

7.1 For design purposes, the product's water vapour resistance may be taken as not more than $0.25 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$ and for roofs designed in accordance with BS 5534 : 2003 or BS 5250 : 2011, Section H, it may be regarded as a Type LR membrane.

7.2 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.

7.3 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 ventilated roof)

7.4 Roofs designed and constructed in accordance with BS 5250 : 2011 will adequately limit the risk of interstitial condensation.

Ceiling and insulation inclined (warm roof)

7.5 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 (eg DuPont's AVCLs) or a continuous envelope of insulation with a high vapour resistance.

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

7.6 Where an insulated ceiling only spans part of the roofline, resulting cold roof spaces should be installed in accordance with Product Sheet 2.

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 the UK National Annex.

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

8.3 For a cold ventilated system, wind loading on the underlay should be calculated in accordance with BS 5534 : 2003, Section 5.5.2.7. Acceptable wind loads with specific batten spacings for the draped product, using a 25 mm deep tiling batten and a 600 mm rafter spacing, are given in Table 1.

Table 1 Resistance to wind loads

Batten spacing (mm)	Maximum pressure (kPa)
350	1.0
330	1.5
300	2.0
250	2.5

9 Strength

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

10 Properties in relation to fire

10.1 The product will melt and shrink away from heat, but will burn in the presence of a naked flame. The product is classified in accordance with EN 13501-1 : 2007 as a Class E* material.

10.2 When the product is used unsupported, there is a risk that fire can spread if it is 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.

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

11 Maintenance

As the product is confined within a roof structure and has suitable durability (see section 12), maintenance is not required.

12 Durability



The product 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 it is 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 product is made from polyethylene and polypropylene that can be recycled.

Installation

14 General

14.1 TYVEK Supro Roof Tile Underlay must be installed and fixed in accordance with the Certificate holder's instructions, 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 product is installed with the 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 2.

Table 2 Minimum overlaps

Roof pitch ⁽¹⁾ (°)	Horizontal lap (mm)		Vertical laps (mm)
	Not fully supported	Fully supported	
12.5 to 14	225	150	300
15 to 34	150	150	300
35+	150	150	300

(1) In all cases the minimum pitch for the slate or tile being used should be considered. Where variations occur, advice from the Certificate holder should be sought.

14.4 In closed eaves constructions, eaves guards should be used to protect the product from sunlight and to direct water into the gutter. TYVEK Eaves Carrier is recommended for this purpose.

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

15 Procedure

Fully supported

15.1 The product may be used over sarking boards of softwood (cold ventilated roofs), and either with continuous insulation or insulation placed between the rafters (warm non-ventilated roofs).

15.2 The product is either secured to the support with counter battens at least 12 mm thick to create a drainage and vapour dispersal space⁽¹⁾ between the product and the tiles or, when using timber sarking, the traditional Scottish practice with the tiles or slates fixed directly into the boards.

(1) This space should be ventilated in accordance with BS 5250 : 2011 when using tight-fitting roof covering.

15.3 Counter battens, when used, are fixed with corrosion-resistant staples or galvanized clout nails as appropriate. Tiling battens are secured to the counter battens and support fixings. Alternatively, the membrane may be installed draped over counter battens, with sufficient drape to allow drainage of liquid water under the tiling battens.

15.4 Care must be taken to minimise the risk of interstitial condensation as described in section 7.5, particularly for timber sarking which may be below the dew-point for extended periods during winter months.

Unsupported

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

16 Finishing

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

16.2 The tiling and slating must be carried out in accordance with the relevant Clauses of BS 5534 : 2003, BS 8000-6 : 1990 and the tile/slate manufacturer's instructions, especially when using tightly-jointed slates or tiles.

17 Repair

Damage to the product can be repaired easily 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 on data to EN 13859-1 : 2010 in relation to:

- dimensions*
- mass per unit area*
- tensile strength and elongation*
- resistance to tear*
- dimensional stability*
- flexibility at low temperature*
- resistance to water penetration*
- water vapour transmission*
- resistance to air penetration*
- resistance to artificial ageing*.

18.2 Tests were carried out:

- to determine:
 - slip resistance
 - Mullen burst strength
 - resistance to wind loads
- to assess:
 - safety during installation
 - robustness during installation
 - properties when installed.

18.3 Data from previous tests on TYVEK membrane assessments were used to assess the properties of:

- wet strength
- low temperature flexibility
- heat ageing
- water immersion
- UV ageing.

19 Investigations

19.1 The condensation risk in warm roof constructions, and specifically those containing sarking boards, incorporating the product was examined.

19.2 An assessment of practicability of installation was made from data gathered during previous assessments of TYVEK Supro Roof Tile Underlay.

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 — Wind actions*
- NA to BS EN 1991-1-4 : 2005 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Wind actions*
- EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
- EN 13859-1 : 2010 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*
- BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

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
- individual 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.