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Agrément Certificate
90/2548
Product Sheet 9

TYVEK CONSTRUCTION MEMBRANES

TYVEK STRUCTUREGUARD

This Agrément Certificate Product Sheet(1) relates to TYVEK(2) StructureGuard, a spunbond, high-density polyethylene (PE-HD) breather membrane for use in timber-frame wall construction.

(1) Hereinafter referred to as 'Certificate'.

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

SUITABLE COLOUR IMAGE TO BE SUPPLIED BY THE CLIENT

Image to be at a preferred resolution of 300dpi sized at 90 mm wide by 75 mm deep

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 — the product will contribute to protecting a wall against water penetration (see section 6).

Risk of condensation — the product has a low resistance to water vapour transmission and will reduce the risk of interstitial condensation (see section 7).

Strength — the product has adequate strength to resist damage during the construction of the wall (see section 8).

Durability — the product will have a service life comparable with other similar elements of construction, eg vapour control layers (see sections 11).

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

On behalf of the British Board of Agrément

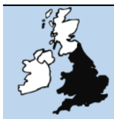
Date of First issue:

John Albon – Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

Regulations

In the opinion of the BBA, TYVEK StructureGuard, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

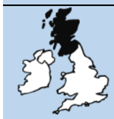


The Building Regulations 2010 (England and Wales) (as amended)

Requirement: **C2(b)** **Resistance to moisture**
Comment: The product will contribute to a wall meeting this Requirement. See section 6.1 of this Certificate.

Requirement: **C2(c)** **Resistance to moisture**
Comment: The product can contribute to limiting the risk of interstitial condensation. See section 7.1 of this Certificate.

Regulation: **7** **Materials and workmanship**
Comment: The product is acceptable. See section 11 and the *Installation* part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: **8(1)** **Durability, workmanship and fitness of materials**
Comment: The product can contribute to a construction satisfying this Regulation. See section 11 and the *Installation* part of this Certificate.

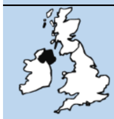
Regulation: **9** **Building standards applicable to construction**
Standard: 3.10 Precipitation
Comment: The product will contribute to a wall satisfying clauses 3.10.1(1)(2) and 3.10.5(1)(2) of this Standard. See section 6.1 of this Certificate.

Standard: 3.15 Condensation
Comment: The product can contribute to limiting the risk of interstitial condensation, with reference to clauses 3.15.1(1)(2) and 3.15.5(1)(2) of this Standard. See section 7.1 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 applicable to conversions**
Comment: Comments in relation to the product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1(1)(2) and Schedule 6(1)(2).

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



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation: **23(a)(i)(iii)(b)(i)** **Fitness of materials and workmanship**
Comment: The product is acceptable. See section 11 and the *Installation* part of this Certificate.

Regulation: **28(a)** **Resistance to moisture and weather**
Comment: The product will contribute to a wall satisfying this Regulation. See section 6.1 of this Certificate.

Regulation:	**29**	**Condensation**
Comment:		The product can contribute to limiting the risk of interstitial condensation. See section 7.1 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, Principal Designer/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 2016

NHBC accepts the use of TYVEK StructureGuard, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.2 *External timber framed walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard EN 13859-2 : 2014. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 TYVEK StructureGuard is a spunbond, high-density polyethylene (PE-HD) membrane.

1.2 The product has the following nominal characteristics:

Thickness (mm)	0.175
Length (m)	100
Width (m)	1.4 and 2.7
Roll weight (kg)	9 (1.4 m) and 18 (2.7 m)
Mass per unit area* ($g \cdot m^{-2}$)	58
Water vapour transmission* — s_d (m)	0.015
Water vapour resistance ($MN \cdot s \cdot g^{-1}$)	0.07
Watertightness*	
control	Class W1
aged (to EN 13859-2)	Class W1
Maximum tensile strength* (N per 50 mm)	
longitudinal	165
transverse	140
Elongation at maximum tensile strength* (%)	
longitudinal	10
transverse	16
Tear strength — nail* (N)	
longitudinal	65
transverse	60
Low-temperature flexibility* (°C)	–40
Water column (m)	1.5 minimum
Reaction to fire*	Class E(1).

(1) On mineral wool and wood.

1.3 Air and Vapour Control Layers (AVCLs) can be used in conjunction with this product. See Product Sheets 4 and 5 of this Certificate.

1.4 Ancillary items for use with the product include:

- TYVEK 2060B Tape — a single-sided tape for sealing joints
- TYVEK Acrylic Tape (double-sided) — tape for sealing joints.

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.

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.

2.3 The management systems of DuPont de Nemours (Luxembourg) S.à r.l. have 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 logo 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 StructureGuard.

Design Considerations

4 General

4.1 In the absence of other guidance, suitable timber-frame constructions are defined as those designed and built in accordance with *NHBC Standards*, Chapter 6.2.

4.2 TYVEK StructureGuard meets the NHBC requirements for sites defined as 'very severe' exposure.

4.3 The membrane can be damaged by high winds, careless handling, vandalism or long-term exposure to UV, and should not be left uncovered for longer than is absolutely necessary. Any damaged areas must be repaired or replaced before completion in accordance with section 15.

5 Practicability of installation

The product can be readily installed by operatives experienced with this type of product.

6 Weathertightness

6.1 The product resists liquid water penetration and wind-blown snow, and will protect the sheathing and frame from external moisture.

6.2 The period prior to the installation of the brickwork should be kept to a minimum. The membranes should not be used as a temporary waterproof covering during this time.

7 Risk of condensation

7.1 The product has a design resistance to water vapour transmission of less than 0.25 $MN \cdot s \cdot g^{-1}$ and is defined as a low resistance membrane (LR) in accordance with BS 5250 : 2011. It will therefore contribute towards minimising the risk of interstitial condensation in walls designed and constructed in accordance with BS 5250 : 2011, Annex G, Section G4.

7.2 The risk of condensation occurring within the wall of a timber-frame building will depend upon the properties and vapour resistance of other materials used in the construction, the internal and external conditions, and the effectiveness of the internal vapour control layer.

7.3 Convective water transfer into the roof construction can be reduced by installing a vapour control layer/air barrier such as DuPont AirGuard AVCLs behind the internal lining (see Product Sheets 4 and 5 of this Certificate).

8 Strength

8.1 The product will resist the normal loads associated with construction and installation into a timber-frame building.

8.2 The product is not adversely affected by water and will retain its properties when wet.

9 Properties in relation to fire

9.1 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.

9.2 Cavity barriers should be used to satisfy the requirements of the national Buildings Regulations.

10 Maintenance

As the product is confined within the wall cavity and has suitable durability (see section 11), maintenance is not required.

11 Durability

The product will be unaffected by the normal conditions found in a timber-frame wall and will have a life equal to that of the building in which it is installed.

12 Reuse and recyclability

The product is made from polyethylene, which can be recycled.

Installation

13 General

TYVEK StructureGuard must be installed in accordance with the Certificate holder's instructions and the recommendations given in *NHBC Standards*, Chapter 6.2, where appropriate.

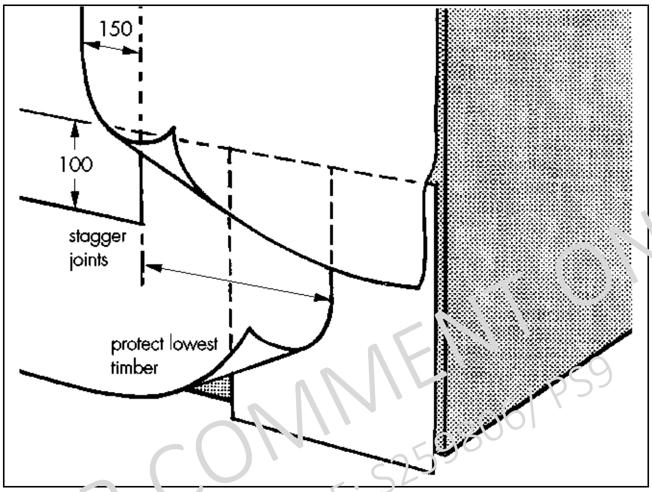
14 Procedure

Lapping and jointing

14.1 The membrane should be fixed with the printed side facing the outer leaf/cladding and in such a way as to shed water away from the sheathing, and below the lowest timber. Upper layers should be lapped over lower layers.

14.2 Horizontal laps should be at least 100 mm and vertical laps 150 mm. Vertical laps should be staggered wherever possible (see Figure 1).

Figure 1 Laps (dimensions in mm)



14.3 To assist in achieving the design air permeability the lap joints and penetrations through the underlay can be sealed with TYVEK 2060B Tape or TYVEK Acrylic Tape (double-sided).

Fixing

14.4 The membrane must be secured at regular intervals with nails and staples to prevent damage by wind (see Figures 2, 3 and 4).

Figure 2 Factory method of installation on timber-frame panel

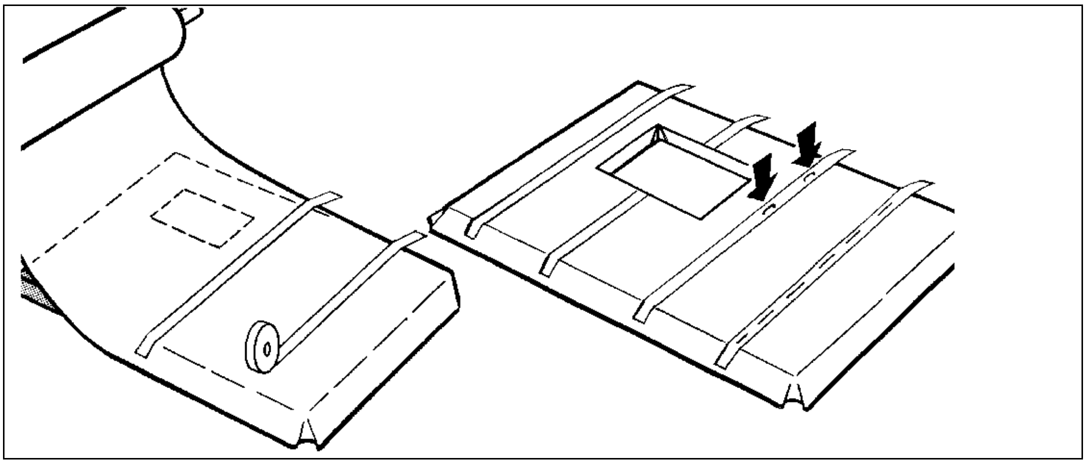


Figure 3 Site installation — external corner

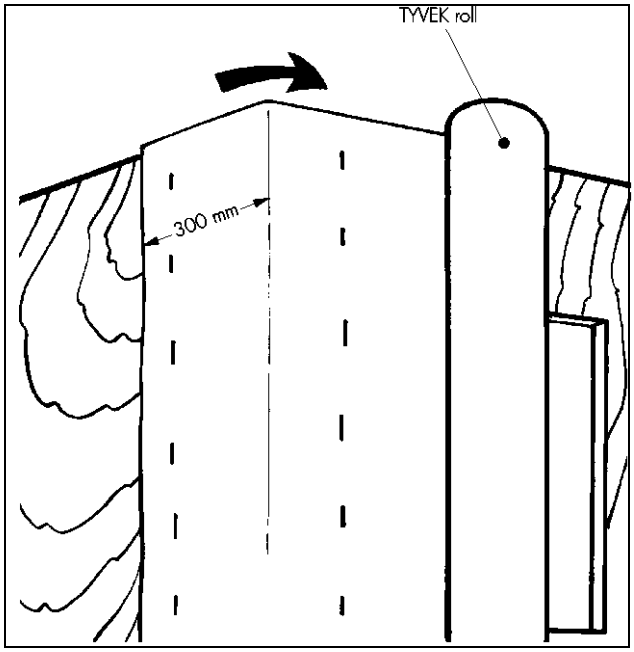
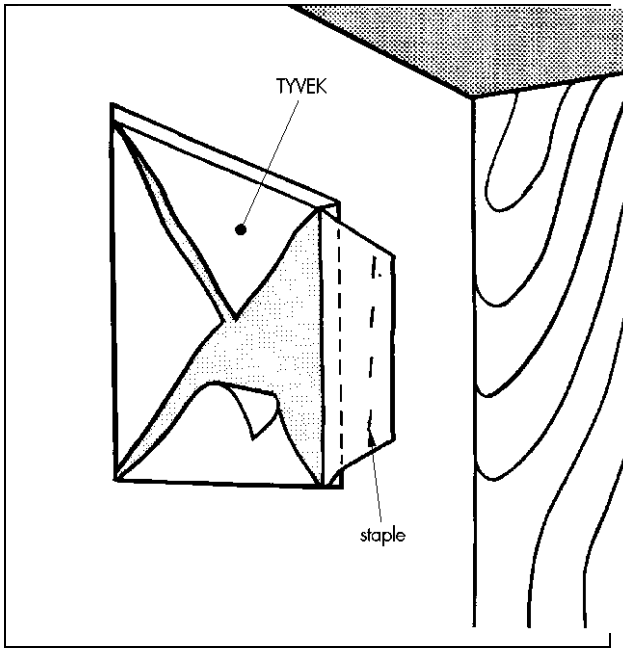


Figure 4 Site installation — opening



14.5 Nails should be of galvanized or sherardized mild steel, austenitic stainless steel, phosphor bronze or silicon bronze. Staples should be of austenitic stainless steel.

Marking stud positions

14.6 It is essential that the positions of studs be marked to enable wall tie fixing.

Lowest timbers

14.7 It is essential that the lowest timbers in the wall be protected by the breather membrane.

15 Repair

Damage to the membrane can be repaired prior to the installation of the external walls or cladding by laying another sheet over the damaged area and sealing it using TYVEK 2060B Tape, ensuring that water is shed away from the sheathing.

Technical Investigations

16 Tests

16.1 An assessment was made on data to EN 13859-2 : 2014 in relation to:

- length
- width
- straightness
- mass per unit area
- tensile strength and elongation
- resistance to tear
- dimensional stability
- low-temperature flexibility
- resistance to water penetration
- water vapour transmission properties
- resistance to artificial ageing

- reaction to fire.

16.2 Tests were carried out on samples of TYVEK Soft and the results assessed to determine:

- Mullen burst strength
- wet strength
- tear resistance after heat ageing and water soak.

to assess:

- robustness during installation
- robustness during service.

17 Investigations

17.1 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.

17.2 An assessment of practicability of installation was made from data gathered during previous assessments of TYVEK

Bibliography

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

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

EN 13859-2 : 2014 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for walls*

18 Conditions

18.1 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 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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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Project No. / Product Sheet No. / Draft No:	S259806 / PS9 / WD
Prod. code / Leader or Follower:	WU / Follower
Project Manager:	RM
Last date saved:	17.6.216
By (initials):	JB