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Agrément Certificate
No 90/2548

TYVEK CONSTRUCTION MEMBRANES

PRODUCT SHEET 1 — TYVEK HOUSEWRAP

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate replaces and extends Certificate No 97/1941 and relates to TYVEK HOUSEWRAP, a high-density, polyethylene, breather membrane for use in timber-frame wall construction.

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 — the product will contribute to protecting a wall against water penetration (see section 5).

Risk of condensation — the product has a low resistance to water vapour transmission and will reduce the risk of interstitial condensation (see section 6).

Strength — the product has adequate strength to resist damage during the construction of the wall (see section 7).

Durability — the product will have a service life comparable to other similar elements of construction, eg vapour control layers (see sections 5.2 and 10).

The BBA has awarded this Agrément Certificate for TYVEK HOUSEWRAP to DuPont de Nemours (Luxembourg) S.à r.l. as fit for its intended use provided it is installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Head of Approvals
— Materials

Chief Executive

Date of First issue: 13 November 1990

Date of Fourth issue: 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 HOUSEWRAP, 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 product will contribute to a wall meeting this Requirement. See section 5.1 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product can contribute to a wall meeting this Requirement with respect to interstitial condensation. See section 6.1 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The product satisfies the requirements of this Regulation. See sections 9 and 10 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 wall satisfying clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.5 ⁽¹⁾⁽²⁾ of this Standard. See section 5.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to a wall satisfying clauses 3.15.1 ⁽¹⁾ and 3.15.5 ⁽¹⁾ of this Standard, with respect to interstitial condensation. See section 6.1 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for this product 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 product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The product is acceptable. See section 9 of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		The product will contribute to a wall satisfying this Regulation. See section 5.1 of this Certificate.
Regulation:	C5	Condensation
Comment:		The product can contribute to a wall to 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).

Non-regulatory Information

NHBC Standards 2007

NHBC accepts that, TYVEK HOUSEWRAP, when installed and used in accordance with this Certificate, satisfies the relevant requirements of the *NHBC Standards*, Chapter 6.2 *External timber framed walls*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, TYVEK HOUSEWRAP, when installed and used in accordance with this Certificate, satisfies the relevant requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *External walls – timber frame*.

General

This Certificate relates to TYVEK HOUSEWRAP, for use as a breather membrane in timber-frame walls with a cavity and conventional masonry, weatherboarding, tile or slate cladding.

Breather membranes are suitable for timber-frame constructions, either factory or site applied.

TYVEK is a registered trademark of DuPont de Nemours (Luxembourg) S.à r.l.

Technical Specification

1 Description

1.1 TYVEK HOUSEWRAP is manufactured by spinning strands of high-density polyethylene (PE-HD) and bonding them together with heat and pressure to form a flexible sheet.

1.2 The product has the nominal characteristics of:

Thickness (mm)	0.17
Weight (gm ⁻²)	61
Roll length (m)	100
Roll width (m)	1.4, 2.7 or 2.8
Hydrostatic head (cm of H ₂ O)	>150
Colour	to order.

1.3 TYVEK SD2 Air Leakage Barrier/Vapour Control Layer, can be used in conjunction with this product. See Product Sheet 4 of this Certificate.

1.4 Ancillary items for use with the product include:

- TYVEK Acrylic Tape — a single-sided tape for sealing joints
- TYVEK Butyl Tape — a double-sided tape for sealing joints.

1.5 Quality control includes visual inspection, measurement of physical properties, thickness and roll weight.

2 Delivery and site handling

2.1 The membrane is delivered to site in rolls with paper wrappings bearing the marketing company's name, the grade identification and the BBA identification mark incorporating the number of this Certificate.

2.2 Rolls should be stored on their side, on a smooth, clean 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 HOUSEWRAP.

Design Considerations

3 General

3.1 TYVEK HOUSEWRAP is suitable for timber-frame constructions, either factory or site applied.

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

3.3 The product meets the NHBC requirements for minimum water penetration resistance and minimum tear resistance in any direction for sites defined as very severe exposure (see section 14, Tables for *Physical properties — directional* and *Physical properties — general*).

3.4 The membrane may be damaged by high winds, careless handling or by vandalism and should not be left uncovered for longer than is absolutely necessary. Any damaged areas should be repaired or replaced before completion in accordance with section 13.

4 Practicability of installation

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

5 Weathertightness



5.1 The product resists liquid water penetration and wind-blown snow and will protect the sheathing and frame from external moisture (see section 14, Table for *Physical properties — general*).

5.2 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.

6 Risk of condensation



6.1 The product has a design resistance to water vapour transmission of less than or equal to 0.6 MNsg⁻¹ and is defined as a 'breather membrane' in accordance with BS 5250 : 2002. Therefore, it will contribute towards minimising the risk of interstitial condensation in suitably designed walls (see section 14, Table for *Physical properties — general*).

6.2 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.

6.3 Convective water transfer into the wall construction can be reduced by installing a continuous airtight sheet such as TYVEK SD2 behind the internal lining. This may also contribute to a successful pressure test by achieving the required design air permeability of $10 \text{ m}^3\text{h}^{-1}\text{m}^{-2}$ in accordance with Approved Document L (see section 12.3 of this Certificate).

7 Strength

7.1 The product will resist the loads associated with construction and installation into timber-frame constructions.

7.2 The product is not adversely affected by water and will retain its properties when wet (see section 14, Table for *Physical properties — directional*).

8 Properties in relation to fire

8.1 The product will have similar properties to polyolefin membranes in relation to fire, tending to burn and shrink away from the heat source. The product is unclassifiable in terms of the Building Regulations and this should be considered when assessing the overall fire risk.

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

9 Maintenance



As the product is confined within a wall construction it has suitable durability (see section 10), maintenance is not required.

10 Durability



The product will be virtually unaffected by the normal conditions found in a timber-frame wall and will have a life comparable with other similar elements of construction, eg vapour control layers.

Installation

11 General

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

12 Procedure

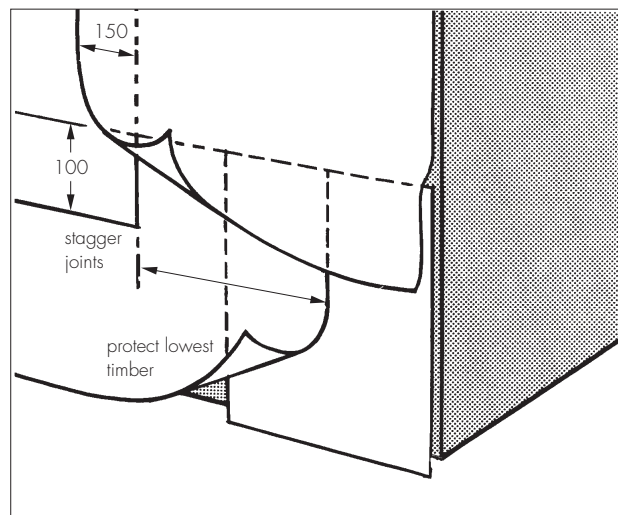
Lapping and jointing

12.1 The membrane should be fixed 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.

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

12.3 To assist in achieving the design air permeability the lap joints and penetrations through the underlay can be sealed with TYVEK Acrylic Tape or TYVEK Butyl Tape.

Figure 1 Laps (dimensions in mm)



Fixing

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

12.5 Nails should be of galvanized or sherardized mild steel, austenitic stainless steel, phosphor bronze or silicon bronze and staples should be of austenitic stainless steel.

Marking stud positions

12.6 It is essential that the positions of studs are marked to enable wall tie fixing.

Lowest timbers

12.7 It is essential that the lowest timbers in the wall are protected by the breather membrane.

Figure 2 Factory method of installation on timber-frame panel

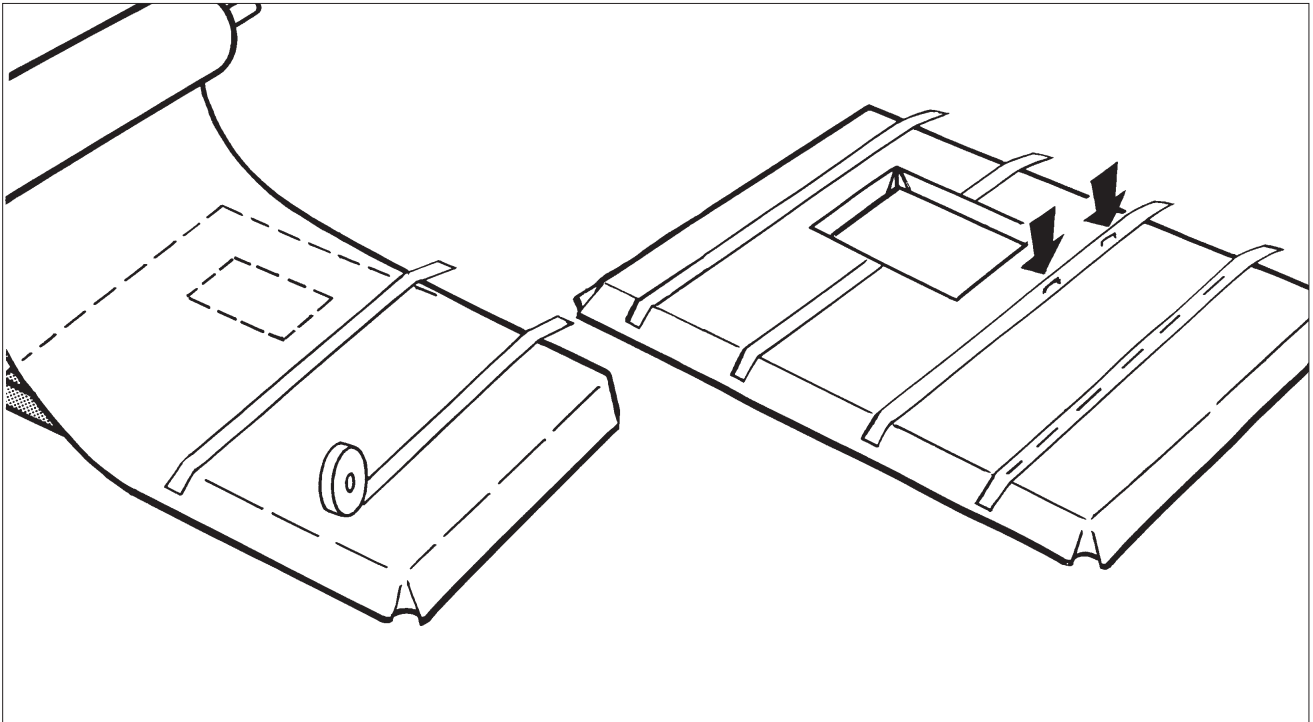


Figure 3 Site installation — external corner

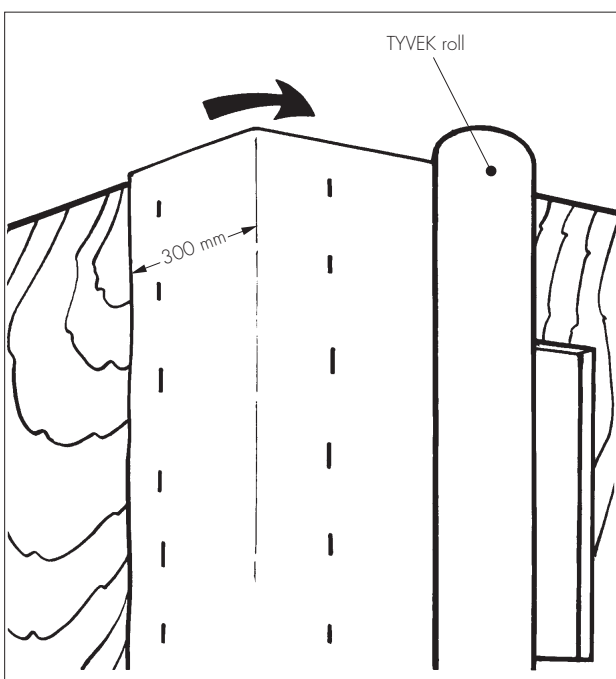
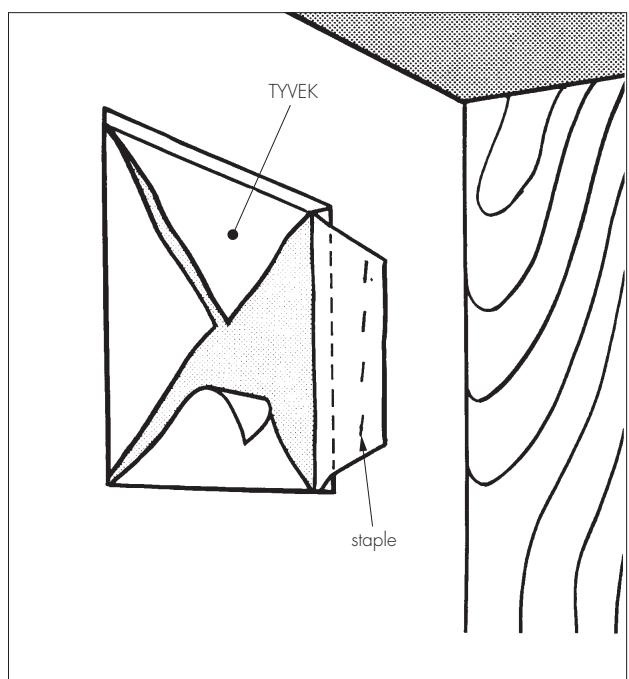


Figure 4 Site installation — opening



13 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 correctly, ensuring water is shed away from the sheathing.

Technical Investigations

14 Tests

Samples of TYVEK HOUSEWRAP and TYVEK 1056B (formerly marketed lighter grade of TYVEK HOUSEWRAP) were obtained from the company for testing. The results of the tests carried out by, or on behalf of, the BBA show typical results for the materials and are summarised in Tables 1 and 2.

Table 1 Physical properties of TYVEK 1056B— directional

Test (units)	Mean result	Method ⁽¹⁾
Tensile strength (Nmm ⁻²)		BS 2782.3-320A
unaged		
long ⁽²⁾	39.79	
trans ⁽³⁾	52.77	
aged ⁽⁴⁾		
long ⁽²⁾	45.00	
trans ⁽³⁾	46.74	
water soak ⁽⁵⁾		
long ⁽²⁾	39.10	
trans ⁽³⁾	47.56	
UV ⁽⁶⁾		
long ⁽²⁾	32.64	
trans ⁽³⁾	38.40	
Elongation at break (%)		BS 2782.3-320A
unaged		
long ⁽²⁾	14.38	
trans ⁽³⁾	18.18	
aged ⁽⁴⁾		
long ⁽²⁾	14.11	
trans ⁽³⁾	16.07	
water soak ⁽⁵⁾		
long ⁽²⁾	14.13	
trans ⁽³⁾	16.90	
UV ⁽⁶⁾		
long ⁽²⁾	9.58	
trans ⁽³⁾	13.79	
Resistance to tear (nail) (N)		MOAT 27 : 5.4.1
long ⁽²⁾	38.8	
trans ⁽³⁾	44.8	
Resistance to tear (trouser) ⁽⁷⁾ (N)		BS 2782.3-320A
unaged	20.9	
aged ⁽⁴⁾	21.1	
water soak ⁽⁸⁾	18.0	

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

(2) Longitudinal direction.

(3) Transverse direction.

(4) Heat aged at 60°C for 36 days.

(5) Water soak at 20°C for 28 days.

(6) UV QUV for 100 light hours (4 hours at 45°C, 4 hours condensation at 40°C).

(7) Peak load results only.

(8) Water soak at 20°C for 56 days.

Table 2 Physical properties — general

Tests (units)	Mean result	Method ⁽¹⁾
Water vapour permeability at 25°C (gm ⁻² day ⁻¹)	1 195 ⁽²⁾	BS 3177
Vapour resistance (MNsg ⁻¹)	0.17 ⁽²⁾	BS 3177
Mullen Burst strength (kNm ⁻²)	978 ⁽³⁾	BS 3137
1 metre head of water	pass ⁽³⁾	MOAT 27 : 5.1.4.2
Resistance to water penetration (Eosin Test)	pass ⁽³⁾	BS 4016

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

(2) TYVEK HOUSEWRAP.

(3) TYVEK 1056B.

15 Investigations

15.1 The methods of quality control were examined and details obtained of the quality and composition of the materials used.

15.2 Visits were made to sites to assess the practicability of installation.

Bibliography

BS 2782-3.320A to 320F : 1976 *Methods of testing plastics — Mechanical properties — Tensile strength, elongation and elastic modulus*

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 4016 : 1972 *Specification for building papers (breather type)*

BS 4016 : 1997 *Specification for flexible building membranes (breather type)*

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

MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing 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.