

Don & Low Ltd Nonwovens

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Agrément Certificate
11/4732
Product Sheet 1

DON AND LOW CONSTRUCTION MEMBRANES

REFLECTASHIELD TF

This Agrément Certificate Product Sheet⁽¹⁾ relates to Reflectashield TF⁽²⁾, a low emissivity, insulating breather membrane for use in timber-frame walls with a cavity and a masonry outer leaf, weatherboarding or tile/slate cladding.

(1) Hereinafter referred to as 'Certificate'.

(2) Reflectashield TF is a registered trademark of Don & Low Ltd Nonwovens.

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).

Thermal insulation — the thermal resistance of a vented cavity incorporating the product may be taken as $0.64 \text{ m}^2 \cdot \text{KW}^{-1}$ (see section 7 and BBA Information Bulletin No 5 *Reflective breather membranes in timber frame walls — Thermal performance claims*).

Condensation risk — the product has a low resistance to water vapour transmission and can contribute to reducing the risk of condensation (see section 8).

Strength — the product has adequate strength to resist damage during the construction of the wall (see section 9).

Durability — the product will have a life equal to that of the building in which it is installed (see section 12).



The BBA has awarded this Certificate to the company named above for the product described herein. The 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 Second issue: 23 May 2013

Originally certificated on 7 April 2011

Simon Wroe
Head of Approvals — Materials

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body — Number 1113. 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, Reflectashield TF, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



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

Requirement:	C2(b)	Resistance to moisture
Comment:		The 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 condensation. See sections 8.4 and 8.8 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to meeting this Requirement. See section 7 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 12.2 and the <i>Installation</i> part of this Certificate.
Regulation:	26	CO ₂ emission rates for new buildings
Comment:		The product can contribute to meeting this Regulation. See section 7 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The use of the product satisfies this Regulation. See section 12.2 and the <i>Installation</i> 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 condensation, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ of this Standard. See sections 8.4 and 8.9 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to a wall satisfying the requirements of these Standards, with reference to clauses 6.1.1 ⁽¹⁾ , 6.1.2 ⁽²⁾ , 6.1.3 ⁽¹⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾⁽²⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽¹⁾⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾⁽²⁾ , 6.2.12 ⁽¹⁾⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See section 7 of this Certificate.
Standard:	7.1(a)(b)	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. In addition the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ , 7.1.6 ⁽¹⁾⁽²⁾ and 7.1.7 ⁽¹⁾⁽²⁾ (Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾⁽²⁾) See section 7 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for 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) 2012

Regulation:	23(a)(i)(iii)(b)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 12.2 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	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 condensation. See section 8.4 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emissions rate
Comment:		The product can contribute to satisfying these Regulations. See section 7 of this Certificate.

Construction (Design and Management) Regulations 2007

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

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

See section: 1 Description of this Certificate.

Additional Information

NHBC Standards 2013

NHBC accepts the use of Reflectashield TF, provided it is installed, used and maintained in accordance with this Certificate, in relation to the *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 BS EN 13859-2 : 2010. An asterisk(*) appearing in this Certificate indicates that data shown is given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

The Reflectashield TF is a low-emissivity insulating breather membrane comprising a spunbonded polypropylene and an aluminium foil on one face. The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (units)	Reflectashield TF
Thickness (mm)	0.55
Mass per unit area* ($\text{g}\cdot\text{m}^{-2}$)	134
Roll length* (m)	50,100 ⁽¹⁾
Roll width* (m)	3.0 ⁽¹⁾
Colour	
upper	silver
lower	white
Tensile strength* (N per 50 mm)	
longitudinal	230
transverse	160
Elongation* (%)	
longitudinal	40
transverse	45
Tear resistance* (N)	
longitudinal	155
transverse	145
Resistance to penetration of air* ($\text{m}^3/\text{m}^2\cdot\text{h}\cdot 50\text{ Pa}$)	9.3
Watertightness*	
unaged	W2
aged ⁽²⁾	W2
Water vapour transmission* (S_d) (m)	0.083
Water vapour resistance ($\text{MN}\cdot\text{s}\cdot\text{g}^{-1}$)	0.41

(1) Other roll sizes are available.

(2) Aged in accordance with BS EN 13859-2 : 2010, Annex C.

2 Manufacture

2.1 The membrane is manufactured by heat laminating a UV-stabilised, nonwoven polypropylene spunbond layer to a perforated, reflective metal foil.

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 Don & Low Ltd Nonwovens has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BSI (Certificate FM 45536).

2.4 The product is marketed by the product's UK distributor A Proctor Group, The Haugh, Blairgowrie, Perthshire PH10 7ER, tel: 01250 872261, fax: 01250 872727, e-mail: insulation@proctorgroup.com, website: www.proctorgroup.com

3 Delivery and site handling

3.1 The membrane is delivered to site in rolls individually wrapped in polyethylene. A technical leaflet bearing the name of the product and BBA identification mark, incorporating the number of this Certificate, is included with each roll. Each roll bears labels with lot numbers for traceability.

3.2 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 Reflectashield TF.

Design Considerations

4 Use

4.1 Reflectashield TF is a low-emissivity, insulating membrane for use as a factory- or site-applied breather membrane in timber-frame walls with a cavity and either a masonry outer leaf, weatherboarding or tile/slate cladding.

4.2 The product reduces the U value (thermal transmittance) of walls by inhibiting radiant heat transfer across the cavity and reduces solar heat gain by reflection.

4.3 In the absence of other guidance, suitable timber-frame constructions are defined as those designed and built in accordance with *NHBC Standards 2013*, Chapter 6.2 *External timber framed walls*.

4.4 The product meets the requirements for a Class W2 material in accordance with BS EN 13859-2 : 2010 and meets the NHBC requirements given in *NHBC Standards 2013*, Chapter 6.2, clause M5 as a high-performance breather membrane for use in very severe conditions⁽¹⁾.

(1) Very severe conditions are defined in the *NHBC Standards 2013*, Appendix 6.1A – Map showing categories of exposure to wind-driven rain.

5 Practicability of installation

The product can be installed by a competent general builder or a contractor experienced with this type of product.

6 Weathertightness



6.1 The product is classified as class W2* in accordance with BS EN 13859-2 : 2010. It 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 or outer cladding should be kept to a minimum.

7 Thermal insulation



7.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE report (BR 443 : 2006), *Conventions for U-value calculations* using an emissivity value of 0.06 for the foil surface of the product. Where this faces into a vertical vented cavity (≥ 20 mm thick) this corresponds to a cavity thermal resistance value of $0.64 \text{ m}^2 \cdot \text{KW}^{-1}$. See BBA Information Bulletin No 5. For a ventilated cavity an effective boundary layer resistance value R_{se} should be taken as $0.36 \text{ m}^2 \cdot \text{KW}^{-1}$.

7.2 The product can contribute to maintaining continuity of thermal insulation at junctions and openings.

7.3 For Accredited Construction Details the corresponding ψ values in BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*, Table 3 may be used in carbon emission calculations in Scotland and Northern Ireland. Detailed guidance for other junctions and on limiting heat loss by air infiltration can be found in:

England and Wales — Approved Documents to Part L and for new thermal elements to existing buildings, Accredited Construction Details (version 1.0). See also SAP 2009 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, Appendix K and the iSBEM User Manual for new-build.

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

8 Condensation risk

8.1 Conventional timber-frame walls designed in accordance with BS 5250 : 2011 and incorporating the product will adequately minimise the risk of condensation.

8.2 The use of the product does not preclude the normal precautions against the formation of condensation, especially in rooms expected to have high humidity.

Interstitial condensation

8.3 The product, although metallised, is perforated and therefore vapour open. It can be used in timber-frame constructions installed on sheathing as a direct replacement for a traditional breather membrane.



8.4 For design purposes, the product has a resistance to water vapour transmission of less than $0.6 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$, and is classified as a breather membrane in accordance with BS 5250 : 2011. Walls incorporating the product will therefore adequately limit the risk of interstitial condensation when designed and constructed in accordance with BS 5250 : 2011, Section 4 and Appendix G.

8.5 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.

8.6 The risk of interstitial condensation is greatest when the building is drying out after construction. Guidance on preventing condensation from this and other sources is given in BRE Digest 369 *Interstitial condensation and fabric degradation* and BRE report (BR 262 : 2002) *Thermal insulation: avoiding risks*.

8.7 The product has additional insulating properties (see section 7.1) and will maintain the frame sheathing at a higher temperature than for the same construction incorporating a conventional breather membrane. This will in turn assist in limiting the risk of interstitial condensation arising from breaches/imperfections in the vapour control layer in the wall's internal lining. However, it must not be relied upon as an alternative to conventional good practice for maintaining integrity of the vapour control layer.

Surface condensation



8.8 Walls incorporating the product will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point and the junctions and openings are designed in accordance with the relevant requirements of *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or BRE Information Paper IP 1/06.



8.9 Walls incorporating the product will adequately limit the risk of surface condensation when designed in accordance with BS 5250 : 2011 and when the thermal transmittance (U value) does not exceed $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point. Additional guidance may be obtained from BRE Report (BR 262 : 2002).

9 Strength

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

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

10 Properties in relation to fire

10.1 The product achieves a Class D classification in accordance with BS EN 13501-1 : 2007.

10.2 The product will have similar properties to polyolefin membranes in relation to fire, tending to burn and shrink away from a heat source. This should be considered when assessing the overall fire risk.

10.3 Cavity barriers must be used to satisfy the requirements of the national Building Regulations.

11 Maintenance

As the product is confined to the wall space and has suitable durability, maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 15).

12 Durability

12.1 The product can be damaged by high winds, prolonged exposure to UV, careless handling or by vandalism and must be covered as soon as possible on completion of installation. Any damaged areas should be repaired or replaced before completion in accordance with section 16.



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

13 Reuse and recyclability

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

Installation

14 General

Reflectashield TF must be installed in accordance with the marketing company's instructions and the recommendations given in *NHBC Standards 2013*, Chapter 6.2, where appropriate.

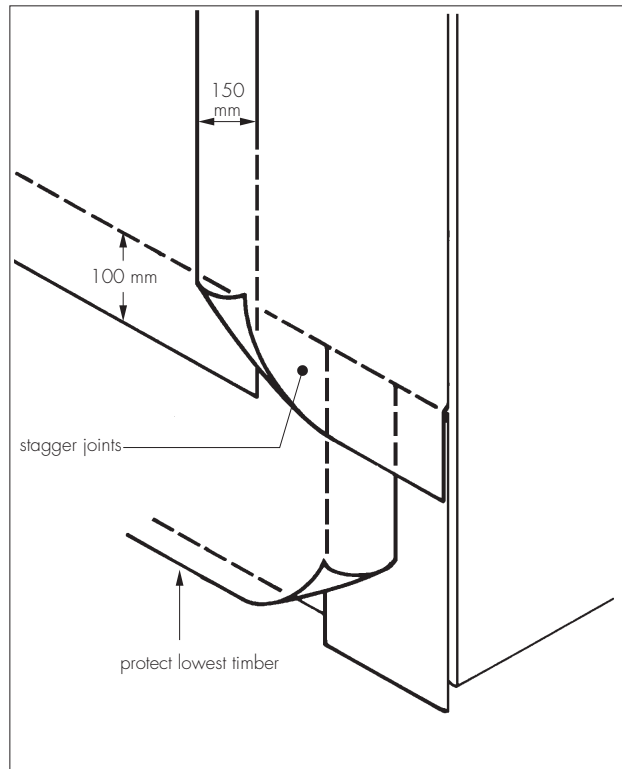
15 Procedure

15.1 To prevent damage by wind action the membrane should be fixed with the silver side installed to the outside at regular intervals not exceeding 500 mm, using austenitic stainless steel nails or staples.

15.2 Upper layers should overlap lower layers to shed water away from the sheathing and below the level of the lowest timber.

15.3 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 Membrane installation



15.4 Where necessary, the positions of the studs should be marked to enable the placement of wall ties and cladding fixings.

15.5 It is essential that the lowest timbers are protected by the membrane.

16 Repair

Damage to the membrane can be repaired prior to the installation of the external walls or claddings by laying another sheet over the damaged area and sealing it correctly, ensuring water is shed away from the sheathing.

Technical Investigations

17 Tests

17.1 An assessment was made of data to BS EN 13859-2 : 2010 in relation to:

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

17.2 Tests on a material of similar specification were carried on wet strength and liquid water penetration.

17.3 The effect of UV and heat ageing on the emissivity of the material was evaluated.

18 Investigations

18.1 The risk of interstitial condensation in a range of typical wall constructions was successfully evaluated.

18.2 The thermal performance by calculation of effective thermal resistance of the cavity in which the product is installed was assessed.

Bibliography

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

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

BS EN 13859-2 : 2010 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for walls*

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

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

19 Conditions

19.1 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.

19.2 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.

19.3 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.

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

19.5 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.

19.6 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.