Don & Low Ltd
Glamis Road
Forfar
Angus DD8 1EY

Tel: 01307 452600 Fax: 01307 452610
e-mail: nonwovens@donlow.co.uk
website: www.donlow.co.uk

Agrément Certificate
99/3648
Product Sheet 1

DON & LOW ROOF LININGS

DALTEX ROOFSHIELD FOR USE IN ENERGY EFFICIENT NON-VENTILATED COLD PITCHED ROOFS

This Agrément Certificate Product Sheet(1) relates to Daltex Roofshield(2), a roof lining for use in energy efficient non-ventilated cold pitched roof systems (for use in non-ventilated warm and ventilated cold pitched roofs, see Agrément Certificate 96/3220).

(1) Hereinafter referred to as 'Certificate'.
(2) Daltex and Roofshield are registered trademarks of Don & Low Limited.

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 is regarded as an air permeable and low water vapour resistance (Type LR) underlay and can be used as part of non-ventilated cold pitched roof systems (see section 7).

Wind loading — when installed on appropriately spaced battens, the product's physical properties are 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 installation of the roof (see section 9).

Properties in relation to fire — the product is classified as Class E in accordance with BS EN 13501-1 : 2007 and its use is restricted in some cases by the national Building Regulations (see section 10).

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

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.

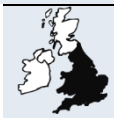
On behalf of the British Board of Agrément

Date of Eighth issue: 6 January 2022
Originally certificated on 27 October 1999

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, Daltex Roofshield for use in energy efficient non-ventilated cold pitched roofs, 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:	**B4(1)**	**External fire spread**
Comment:		The product is unrestricted by this Requirement, in some circumstances. See sections 10.1 and 10.2 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The product will contribute to a roof satisfying this Requirement. See section 6.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The product will enable a roof to satisfy this Requirement with regard to interstitial condensation. See section 7 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The product is acceptable. See section 12 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 roof satisfying this Regulation. See section 12 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.6	Spread to neighbouring buildings
Comment:		The product is restricted under clause 2.6.4(1)(2) of this Standard, in some circumstances. See sections 10.1 and 10.3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product will contribute to a roof satisfying clauses 3.10.1(1)(2) and 3.10.8(1)(2) of this Standard. See section 6.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can enable a roof to satisfy this Standard with respect to interstitial condensation. See section 7 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:		All comments given for 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)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The product is acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The product will contribute to a roof satisfying this Regulation. See section 6.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The product can enable a roof to satisfy this Regulation. See section 7 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.1) and 14 *General* (14.6) of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, Daltex Roofshield for use in energy efficient non-ventilated cold pitched roofs, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.2 *Pitched roofs* without the need of additional high level ventilation.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13859-1 : 2014.

Technical Specification

1 Description

1.1 Daltex Roofshield for use in energy efficient non-ventilated cold pitched roofs is a triple layer spun-bonded polypropylene breather membrane. The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Roofshield
Thickness (mm)	0.75
Mass per unit area ($g \cdot m^{-2}$)	185
Roll length (m)	50/100
Roll width (m)	1.0/1.5(1)
Colour upper lower	 green(1) white(1)
Tensile strength ($N \cdot 50\ mm^{-1}$) longitudinal transverse	 390 230
Elongation (%) longitudinal transverse	 55 75
Tear resistance (N) longitudinal transverse	 230 275
Resistance to penetration of air ($m^3 \cdot m^2 h^{-1} 50Pa^{-1}$)	34.4
Watertightness unaged aged(2)	 W1 W1
Equivalent air layer thickness (S_d)(m)	0.013
Vapour resistance ($MN \cdot s \cdot g^{-1}$)	0.065

(1) Other widths and colours are available.
(2) Aged in accordance with BS EN 13859-1 : 2014, Annex C.

2 Manufacture

2.1 The membrane is manufactured by lamination of an air and water-vapour-permeable membrane between two layers of non-woven spunbonded polypropylene 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 system of Don & Low Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate FM 45536).

2.4 The product is marketed in the UK by the A.Proctor Group, Blairgowrie, Perthshire, PH10 7ER, tel: 01250 872261, fax: 01250 872727, email: contact@proctorgroup.com, website: www.proctorgroup.com.

3 Delivery and site handling

3.1 Rolls are delivered to site individually wrapped in polythene. A technical leaflet bearing the product name and the BBA logo incorporating the number of this Certificate is included with each roll.

3.2 Rolls should be stored flat or on end 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 Daltex Roofshield for use in energy efficient non-ventilated cold pitched roofs.

Design Considerations

4 Use

4.1 Daltex Roofshield for use in energy efficient non-ventilated cold pitched roofs is satisfactory for use in dwellings with non-ventilated tiled or slated roofs of any conventional plan and size. Features(1) assessed include:

- duo pitched
- gable ends
- room-in-roof(2)
- mono-pitched
- verges
- dormers
- hipped
- abutments
- timber sarking planks (3,4,5)
- mansard
- valleys.

(1) For roofs incorporating other features, or unconventional roof geometries or construction materials, the advice of the Certificate holder should be sought.
(2) Where a room-in-roof results in part of a pitch being insulated (ie a warm roof), design and detailing of that part of the roof should comply with the relevant guidance given in 96/3220 Product Sheet 1.
(3) Timber sarking, Scottish practice: the membrane is laid over open-jointed timber planks (nominally 150 mm wide with a 2 mm gap) and fixed with galvanized clout nails. Slates are nailed through the membrane onto the sarking without battens.
(4) Timber sarking, tiled roofs: Counter battens of 12 mm minimum thickness should be used to provide a drainage path beneath the tiling battens. The membrane may be laid directly over the timber planks or draped over the counter battens.
(5) Sheet sarking materials should not be used.

4.2 The product can also be used in non-ventilated warm and ventilated cold pitched roofs. These applications are covered by Agrément Certificate 96/3220.

4.3 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.

4.4 The product should be installed by draping over rafters in the traditional manner, parallel to eaves and securing with tiling battens. The insulation, laid horizontally at ceiling level, is pressed tightly into the eaves against the underlay to ensure no gaps are present.

4.5 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 significantly reduce this mechanism of heat loss.

4.6 In non-ventilated roof systems, the risk of condensation is equivalent to, or less than, that for conventionally ventilated cold roof systems (see section 7).

5 Practicability of installation

The product is designed to be installed by competent slaters/tilers, experienced with this type of product.

6 Weathertightness

6.1 The product is classified as Class W1 in accordance with BS EN 13859-1 : 2014 and will resist the passage of water and 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 : 2014.

6.2 The product resists the 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. Further information is given in BBA Information Bulletin No 2 *Permeable Roof Tile Underlay — Guide to Good Site Practice.*

7 Risk of condensation

7.1 For design purposes, the product's water vapour resistance may be taken as not more than 0.1 MN·s·g^{-1}, and for roofs designed in accordance with BS 5534 : 2014 or BS 5250 : 2021 Section 12, it may be regarded as a Type LR membrane.

7.2 The product is also air-permeable, with a nominal value of 34.4m^3·h^{-1}·m^{-2} at 50 Pa pressure difference, allowing a significant mechanism for water vapour egress by convection.

7.3 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 product is laid in accordance with the Certificate holder's instructions and this Certificate to minimise the risk of condensation.

7.4 The risk of condensation is highest in new-build construction during the first heating period, where there is high moisture loading owing to wet trades, such as in-situ cast concrete slabs or plaster. The air permeability of the product will reduce this risk (see section 7.2). 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*.

7.5 All penetrations into and out of the roof space must be properly sealed in accordance with the Certificate holder's instructions, which include 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.

7.6 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 the 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.

7.7 A vapour control layer is not required (see section 7.2).

8 Wind loading

8.1 Project design wind speeds for the roof in which the product is installed should be determined and wind uplift forces calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex.

Unsupported

8.2 The product is satisfactory for use in unsupported systems in the geographical Wind Zones given in Table 2, where a well-sealed ceiling, as defined in clause 3.7 of BS 9250 : 2007, is present and the roof has a ridge height of ≤15 m, a pitch between 12.5 and 75°, and a site altitude of ≤100 m, and where topography is not significant. For all other cases, the required uplift resistance should be determined using BS 5534 : 2014 and the Certificate holder's declared wind uplift resistances given in Table 3.

Table 2 Zones of applicability of Roofshield according to BS 5534 : 2014, clause A.8 with battened laps and laps with counterbattens

Product	≤345 mm batten gauge with battened laps	≤250 mm batten gauge with battened laps	≤345 mm batten gauge with counterbatten(1)
Roofshield	Zones 1 to 3	Zones 1 to 5	Zones 1 to 5

Table 3 Declared wind uplift resistance (Pa)

Product	≤345 mm batten gauge with battened laps[3]	≤250 mm batten gauge with battened laps[2][3]	≤345 mm batten gauge with counterbatten[1][3]
Roofshield	1252	2574	2192

(1) This applies to any counterbatten ≥11 mm deep. NHBC does not accept the Wind Zones and wind uplift resistance when using counterbattens on an unsupported roof.
(2) Underlays with a wind uplift resistance at a 250 mm batten gauge that satisfy the minimum design wind pressure of 820 Pa for Zone 1 are deemed to satisfy the requirements for use at 100 mm batten gauge in all Wind Zones.
(3) Mean of test results.

Supported

8.3 Sarking boards, such as square-edged butt jointed planks, are not considered to be airtight and the underlay is treated as unsupported. When used with slates nailed directly onto softwood sarking boards, the product is satisfactory for use in geographical Wind Zones 1 to 5 and will achieve wind uplift resistance of 2974 Pa.

9 Strength

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

10 Properties in relation to fire

10.1 The product has a Class E[1] classification in accordance with BS EN 13501-1: 2007 .

(1) BBTG Report refence 27/05429E/09/20. A copy of the report is available from the Certificate holder.

10.2 In England and Wales, the products, when used in pitches of greater than 70°, should not be used on buildings that have a storey at least 18 m above ground level and which contain one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.

10.3 In Scotland, the products, when used in pitches greater than 70°, excluding upstands, should not be used on buildings that have a storey more than 11 m above ground level.

10.4 When the product is used unsupported, there is a risk that fire can spread if the materials are accidently 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 material being ignited.

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

11 Maintenance

As the product is confined within the roof system and has suitable durability (see section 12), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 16).

12 Durability

The product will be virtually unaffected by the normal conditions found in a roof space and will have a life comparable to that of traditional roof tile underlays, provided it is not exposed to sunlight for long periods (see section 14.5). Advice regarding exposure can be obtained from the Certificate holder.

13 Reuse and recyclability

The product contains polypropylene, which can be recycled.

Installation

14 General

14.1 Daltex Roofshield for use in energy efficient non-ventilated cold pitched roofs must be installed and fixed in accordance with the Certificate holder's instructions, the provisions of this Certificate and the relevant recommendations of BS 5534 : 2014 , BS 8000-0 : 2014 and BS 8000-6 : 2013. Installation can be carried out under all conditions normal to roofing work.

14.2 The product is installed with the green 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 4.

Table 4 Minimum overlaps

Roof pitch (°)	Horizontal laps (mm)	Vertical laps (mm)
12.5 ≤ 15	225	100
≥15	150	100

14.4 Where possible, eaves guards should be used to protect the product from sunlight and direct water into the gutter.

14.5 The product has a smooth surface with a low coefficient of friction and care should be taken when moving or standing on a wet surface covered with the product.

15 Procedure

Draped and loose laps

15.1 The product 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.

Timber sarking planks

15.2 For fully supported roofs (traditional Scottish practice), the slates can be nailed through the product into the timber sarking planks, normally 150 mm wide with a 2 mm gap. The underlay should be fixed to the sarking using galvanized clout nails or staples.

16 Repair

Damage to the product can be repaired prior to the installation of slates or tiles by patching and sealing the damaged areas. Care must be taken to ensure that the watertightness of the roof is maintained.

17 Finishing

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

17.2 To minimise the risk of condensation, it is important that the following details are maintained (see also sections 7.3, 7.5 and 7.6):

17.3 Tiling and slating must be carried out in accordance with the relevant clauses of BS 5534 : 2014, BS 8000-0 : 2014, BS 8000-6 : 2013 and the tile/slate manufacturer's instructions, especially when using tightly jointed slates or tiles, where a ventilated batten space should be provided.

18 Tests

18.1 An assessment was made of data to BS EN 13859-1 : 2014 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.

18.2 Tests were carried out to determine:

- slip resistance
- resistance to streaming water
- mullen burst strength
- resistance to wind loads

in order to assess:

- safety during installation
- performance under typical service conditions
- robustness during installation
- properties when installed.

19 Investigations

19.1 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.

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

19.3 An assessment of the practicability of installation was made from site visits and data gathered during previous assessments of Daltex Roofshield.

19.4 Monitored data, covering internal loft space temperature and relative humidity, plus moisture content of the rafters was evaluated. The data was collected over winter and summer months.

19.5 An examination was made of independent data on the investigation of wind loads on underlay/tile roof systems and data on the behaviour of roof tile underlays under suction.

Bibliography

BS 5250 : 2011: 2021 *Management of moisture in buildings - Code of practice*

BS 5534 : 2014 + A1 : 2015 *Slating and tiling for pitched roofs and vertical cladding — Code of practice*

BS 8000- 0 : 2014 *Workmanship on construction sites — Introduction and general principles*
BS 8000-6 : 2013 *Workmanship on building sites — Code of practice for slating and tiling of roofs and walls*

BS 9250 : 2007 *Code of practice for design of the airtightness of ceilings in pitched roofs*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*

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

BS EN 13859-1 : 2014 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*

BS EN ISO 9001 : 2015 *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
- 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.

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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk