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Agrément Certificate
05/4283
Product Sheet 5

SPIRTECH BREATHABLE MEMBRANES

SPIRTECH 400 2S FOR USE IN COLD PITCHED ROOFS

This Agrément Certificate Product Sheet(1) relates to Spirtech 400 2S, a breather membrane for use as a roof tile underlay in cold ridge-ventilated pitched roofs.

(1) Hereinafter referred to as 'Certificate'.

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 a low water vapour resistance (Type LR) underlay and can be used as part of a cold pitched roof system (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).

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 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 Second issue: 9 May 2018

Originally certificated on 30 November 2015

John Albon – Head of Approvals Construction Products

Claire Curtis-Thomas
Chief Executive

The BBA is a UKAS accredited certification body – Number 113.

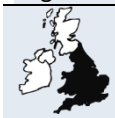
The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

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.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

Regulations

In the opinion of the BBA, Spirtech 400 2S for use in 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):



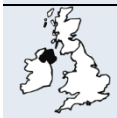
The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**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 contribute to a roof satisfying this Requirement with respect to interstitial condensation. See section 7 of this Certificate.
Regulation:	**7**	**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 use of the product satisfies the requirements of this Regulation. See section 12 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 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)(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.
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 section: 1 *Description* (1.2) of this Certificate.

Additional Information

NHBC Standards 2018

In the opinion of the BBA, Spirtech 400 2S for use in 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*.

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. 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 Spirtech 400 2S for use in cold pitched roofs is a flexible, four-layer breathable membrane, comprising two layers of spunbond polypropylene, reinforcing netting and a low-density polyethylene (LDPE) film. The membrane has a double integral tape on the selvedge edges for sealing overlaps.

1.2 The product has the following nominal characteristics:

Roll width (m)	50
Roll length (m)	1.5
Mass per unit area ($g \cdot m^{-2}$)	220
Tensile strength* (N per50 mm)	
longitudinal	550
aged(1)	500
transverse	500
aged(1)	440
Tear resistance* (N)	
longitudinal	450
transverse	450
Watertightness*	
unaged	W1
aged(1)	W1
Equivalent air layer thickness S_d (m)	0.04
Resistance to low temperature (°C)	–20°C.

(1) Aged in accordance with BS EN 13859-1 : 2014, Annex C.

1.3 Also for use with the product, but outside the scope of this Certificate, is Redland Divo Tape, a single-sided tape for sealing laps and junctions and Klober Permo TR Plus Tape for repairing tears on the underlay during installation.

2 Manufacture

2.1 The product is manufactured by heat lamination.

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 the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by TÜV Hessen (Certificate 73100176).

3 Delivery and site handling

3.1 Rolls are delivered to site individually wrapped in polythene with a red label bearing the company name and the product name. A label carrying the BBA logo incorporating the number of this Certificate is applied to the outer polythene wrapper.

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 Spirtech 400 2S for use in cold pitched roofs.

Design Considerations

4 Use

4.1 Spirtech 400 2S for use in cold pitched roofs is satisfactory for use as a vapour-permeable roof tile underlay in dwellings with ridge-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(3)
- mansard
- valleys.

(1) For roofs incorporating other features, or non-conventional 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 roof pitch being insulated (ie a warm roof), design and detailing of that part of the roof should comply with relevant guidance given in Product Sheet 6 of this Certificate.

(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. Alternatively, counter battens of 12 mm minimum thickness can 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.

4.2 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.

4.3 The product can be installed by draping over rafters and securing with tiling battens, or installed taut over rafters and secured with counter battens and tiling battens, or supported over uninsulated timber plank sarking with counter battens and tiling battens.

4.4 A well-sealed ceiling requires that:

- the design avoids constructional gaps, especially at the wall/ceiling junction with a dry lining construction and holes in the ceiling
- the access door or hatch must not be located in a kitchen or bathroom
- the air leakage rate through an access hatch, including its frame, when tested to BS EN 13141-1 : 2004, Clause 4.3, is less than 1 $m^3 \cdot h^{-1}$ at a pressure difference of 2 Pa. It can be assumed that 'push up' wooden hatch covers in a frame, constructed in situ, with continuous compressible seals, will meet this criterion provided the weight of the door is at least 5.5 kg. Hatch covers should either be heavy enough to compress a seal or be clamped, with a closed cell compressible seal or O-ring between it and the frame. For drop-down hatch covers, it is recommended that proprietary units with a supplied hatch cover and frame are used
- penetrations, such as those for services and rooflights, are permanently sealed with suitable proprietary products
- recessed light fittings should either:
  - comply with BS EN 60529 : 1992 and be rated IP 60 to IP 65, depending on room use, or
  - incorporate an appropriate sealed hood or box which ensures that the total leakage through all downlighters does not exceed 0.06 $m^3 \cdot h^{-1}$ at 2 Pa. The leakage of individual downlighters can be tested to BS EN 13141-1 : 2004, Clause 4.3
- the ceiling is sealed to the external walls to limit any leakage through cracks.

5 Practicability of installation

The product is designed to be installed by competent roofers 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 0.25 $MN \cdot s \cdot g^{-1}$, and for roofs designed in accordance with BS 5534 : 2014 or BS 5250 : 2011 Annex H, it may be regarded as a Type LR membrane.

7.2 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.

7.3 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 risk of condensation diminishes as the building naturally dries out. Further information is given in BBA Information Bulletin No 1 *Roof Tile Underlays in Cold Roofs during the Drying-out Period.*

7.4 Vent stacks and boiler flues passing through the roof space must be sealed.

7.5 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 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.

7.6 For additional protection, the use of a vapour control layer/vapour check plasterboard can be considered, although not necessary.

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 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 in Table 1.

Table 1 Zones of applicability of Spirtech 400 2S according to BS 5534 : 2014, clause A.8 with integrated taped laps.

Product	≤345 mm batten gauge	≤250mm batten gauge	≤100mm batten gauge
Spirtech 400 2S	Zones 1 to 5	Zones 1 to 5	Zones 1 to 5

Table 2 Declared wind uplift resistance (Pa)

Product	≤345 mm batten gauge(1)	≤250mm batten gauge(1)	≤100mm batten gauge (1)
Spirtech 400 2S	5809	≥5809	≥5809

(1) Mean of test results.

Supported

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

8.4 The product may be used at any batten gauge in all Wind Zones when laid over nominally airtight timber sarking, for example OSB, plywood, chipboard. It may also be used in applications where slates are nailed directly onto sarking boards.

8.5 Timber sarking, such as square-edged butt jointed planks, are not considered to be airtight and the underlay is treated as unsupported.

9 Strength

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

10 Properties in relation to fire

10.1 When tested to EN ISO 11925-2 : 2002, the product achieved a Class E* classification in accordance with BS EN 13501-1 : 2007.

10.2 The product will have similar properties in relation to fire to those of traditional polyethylene roof tile underlays.

10.3 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.

10.4 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 Spirtech 400 2S for use in 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 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 dark grey printed side uppermost and lapped to shed water out and down the slope.

14.3 The product has two parallel adhesive strips which must be sealed at all horizontal laps.

14.4 Since the underlay is always laid with a 150 mm overlap owing to the position of the adhesive strips, its minimum pitch of use is 15° when not fully supported and 12.5° when fully supported.

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

15 Procedure

Draped and loose laps

15.1 The product, when installed as an unsupported system, is fixed in the traditional method for roof tile underlays, ie laid parallel to the eaves, draped between the rafters, with the dark grey printed side uppermost. The underlay is left 30 mm short of the ridge apex on both sides of the apex.

15.2 When used above a well-sealed ceiling, high-level loft space ventilation (minimum value of 5,000 mm^2 per metre run) is required. Dry-fix ridge ventilation is recommended; alternatively, ventilation tiles can be used.

15.3 When used above a ceiling that is not well sealed, low-level loft space ventilation (minimum value of 10,000 mm^2 per metre run) and high-level ventilation (minimum value of 5,000 mm^2 per metre run) are required.

15.4 When fibre-cement or metal roofing sheets are used, low-level ventilation (minimum value of 25,000 mm^2 per metre run) and high-level ventilation (minimum value of 5,000 mm^2 per metre run) are required to ventilate the batten cavity.

Timber plank sarking

15.5 For fully supported roofs (traditional Scottish), the slates can be nailed through the product into the timber plank sarking, normally 150 mm wide with a 2 mm gap.

15.6 For fully supported roofs (where battens are used), counterbattens of minimum thickness 12 mm should be installed either above or below the underlay, for drainage purposes.

16 Repair

Damage to the product can be repaired prior to the installation of slates or tiles by patching and sealing the damaged areas with an underlay repair tape such as Klober Permo TR Plus Tape. 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 achieve a convection-tight loft space, it is important that the following details are maintained (see also sections 7.4 and 7.5):

- the loft hatch must be securely sealed to ensure a draught-free fit
- the insulation must be pushed into the eaves and against the underlay or eaves ventilators should be used as per clause 15.3 to avoid gaps.

17.3 Tiling and slating must be carried out in accordance with the relevant clauses of BS 5534 : 2014, BS 8000-6 : 2013 and the Certificate holder's instructions, especially when using tightly jointed slates or tiles.

Technical Investigations

18 Tests

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

- dimensions
- mass per unit area
- straightness
- dimensional stability
- resistance to water penetration
- resistance to artificial ageing
- resistance to tearing
- tensile strength and elongation
- water vapour transmission
- watertightness of joints.

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

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.

Bibliography

BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*

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

BS 8000-6 : 2013 *Workmanship on building sites — Code of practice for slating and tiling of roofs and walls*

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 *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 : 2008 *Quality management systems — Requirements*

EN ISO 11925-2 : 2002 *Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame — Single-flame source test*

BS EN 60529 : 1992 + A2 : 2013 *Degrees of protection provided by enclosures (IP code)*

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 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.