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Agrément Certificate  
**05/4283**  
Product Sheet 3

## SPIRTECH VAPOUR PERMEABLE UNDERLAY SYSTEM IN ENERGY-EFFICIENT ROOFS

### SPIRTECH 100 — FOR USE IN COLD PITCHED ROOFS

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Spirtech 100 Vapour Permeable Underlay, for use in cold pitched roofs.

#### 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

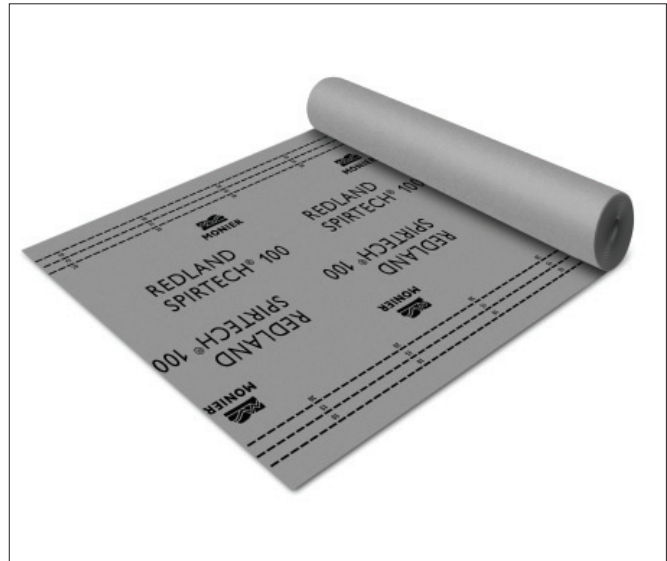
**Weathertightness** — as part of a complete roof, the product will resist the passage of water and wind-blown snow and dust into the interior of the building (see section 5).

**Risk of condensation** — the product is regarded as a low water vapour resistance (Type LR) underlay and can be used as part of a cold roof system (see section 6).

**Wind loading** — when installed on appropriately spaced battens the product's physical properties are deemed 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 7).

**Strength** — the product has adequate strength to resist the loads associated with the installation of the roof (see section 8).

**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 11).



The BBA has awarded this Agrément 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

Simon Wroe  
Head of Approvals — Materials

Greg Cooper  
Chief Executive

Date of First issue: 28 October 2009

*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](http://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, Spirtech 100 — for use in cold pitched roofs, 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 roof meeting this Requirement. See section 5.1 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product will contribute to a roof meeting this Requirement with respect to interstitial condensation. See sections 6.1 to 6.7 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part 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 the requirements of this Regulation. See section 11 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 roof satisfying clauses 3.10.1 <sup>(1)</sup> and 3.10.7 <sup>(1)</sup> of this Standard. See section 5.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can enable a roof to satisfy this Standard with respect to interstitial condensation. See sections 6.1 to 6.7 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 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (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 11 and the <i>Installation</i> part of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		The product will contribute to a roof satisfying this Regulation. See section 5.1 of this Certificate.
Regulation:	C5	Condensation
Comment:		The product can enable a roof to satisfy this Regulation. See sections 6.1 to 6.7 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* (1.2).

# Non-regulatory Information

## NHBC Standards 2008

NHBC accepts the use of Spirtech 100 — for use in cold pitched roofs, when installed and used in accordance with this Certificate, as meeting Technical Requirement R3 in relation to *NHBC Standards, Chapter 7.2 Pitched roofs*.

## Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Spirtech 100 — for use in cold pitched roofs, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual, Section 4 Superstructure, Sub-section Pitched roofs*.

## General

This Certificate relates to Spirtech 100 Vapour Permeable Underlay, for use in cold pitched roofs, for use as a vapour permeable roof tile underlay in cold pitched roof systems.

The product will also prevent the ingress of wind-blown rain or snow.

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.

## Technical Specification

### 1 Description

1.1 Spirtech 100 — for use in cold pitched roofs is a vapour permeable underlay manufactured by heat laminating two spunbond polypropylene layers with a breathable polypropylene film in between the two layers.

1.2 The product has the nominal characteristics of:

Mass per unit area ( $\text{gm}^{-2}$ )	103
Roll length (m)	50
Roll width (m)	1.0, 1.5
Roll weight (kg)	5.150, 7.725
Colour	grey

1.3 The following ancillary items are available for use with the product in the systems:

- Redland Underlay Support Tray — for use as a continuous support for the underlay at the eaves and a UV-resistant drip into the gutter
- Redland RedVent 25 Over-fascia Vent — for use in providing low-level batten space ventilation when Spirtech 100 is used with tight-fitting roof coverings
- Redland Eaves Ventilation System — for use in providing low-level loft space ventilation where a well-sealed ceiling cannot be achieved
- Redland Rapid Vented Ridge System and DryVent Ridge System — ventilated dry fix systems for mechanically fixing ridge tiles. Both systems are supplied with the fixings and components required to provide ventilation and secure the ridge tiles
- Redland DryVent Monoridge — a ventilated dry fix ridge system for mono-pitched roof systems
- Redland Rapid Hip and Dry Hip — for use in providing high-level batten space ventilation when Spirtech 100 is used with tight-fitting roof coverings
- Redland Top Edge Abutment Ventilation System — a system for providing high-level ventilation for lean-to roofs
- Redland Redline Ventilation Tiles and Redland ThruVent System — for use in providing both high- and low-level batten space ventilation or loft space ventilation where required
- Redland Concrete and Clay tiles and ridge tiles — a range of tiles and ridge tiles complying with BS EN 490 : 2004 and BS EN 1304 : 1998 respectively.

1.4 Quality control checks are carried out on the incoming materials, during production and on the finished product. Quality control checks on the finished product include:

- mass per unit area
- hydrostatic head
- water vapour transmission
- tensile strength
- nail tear.

### 2 Delivery and site handling

2.1 The membrane is delivered to site in rolls wrapped in polyethylene with a label bearing the Certificate holder's name and product name. A label bearing the BBA identification mark incorporating the number of this Certificate is applied to the outer polyethylene wrapper.

2.2 The rolls should be stored 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 100 — for use in cold pitched roofs.

## 3 General

3.1 Spirtech 100 — for use in cold pitched roofs is satisfactory for use as an unsupported, vapour permeable roof tile underlay in cold-pitched roofs with a lower level of ventilation than with an impermeable underlay. The product is laid in the traditional manner, parallel to the eaves, and fixed in accordance with BS 5534 : 2003 to the rafters. The mineral wool insulation, laid horizontally at ceiling level can be pressed into the eaves to ensure cold bridging is minimised. The tiling and slating of the pitched roofs should be constructed in accordance with the relevant Clauses of BS 5534 : 2003.

3.2 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.

3.3 The product is satisfactory for use in dwellings with non-ventilated tiled or slated roofs of any conventional plan and size. Features<sup>(1)</sup> successfully assessed include:

- duo pitched
- gable ends
- room-in-roof
- mono-pitched
- verges
- dormers
- hipped
- abutments
- timber sarking<sup>(2)</sup>
- mansard
- valleys.

(1) For roofs incorporating other features, non-conventional roof geometries or construction materials, the advice of the Certificate holder should be sought.

(2) As in Scottish practice, with slates nailed through the breather membrane directly onto timber planks (nominally 150 mm wide with a 2 mm gap) without battens.

3.4 In conventionally-ventilated roof constructions, energy loss by ventilation can account for up to 25% of the total heat loss through the roof. The system will significantly reduce this mechanism of heat loss.

3.5 In the system, the risk of condensation is equivalent to that attending conventionally-ventilated cold roof systems using a high resistance (HR) underlay.

3.6 The performance of Spirtech 100 is enhanced when used in combination with a well-sealed ceiling. This minimises the transfer of water vapour through the roof as well as reducing heat loss through the ceiling.

3.7 A well-sealed ceiling requires the following:

- the design avoids constructional gaps, especially at the wall ceiling junction with dry lining construction and holes in the ceiling
- 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  $1 \text{ m}^3\text{h}^{-1}$  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 meeting the following criteria: the total leakage through all downlighters should not exceed  $0.06 \text{ m}^3\text{h}^{-1}$  of ceiling 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.

## 4 Practicability of installation

Installation can be carried out readily by slaters/tilers experienced with this type of installation.

## 5 Weathertightness



5.1 Results of tests indicate that the product 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 : 2003.

5.2 The product resists penetration of liquid water and consequently may be used as a temporary waterproofing prior to the installation of slates or tiles. The period of such use should, however, be kept to a minimum. Advice should be sought from the Certificate holder (see section 16, Table for *Physical properties — general*).

## 6 Risk of condensation



6.1 For design purposes, the product's water vapour resistance may be taken as not more than  $0.25 \text{ MNsg}^{-1}$ , and for roofs designed in accordance with BS 5534 : 2003 or BS 5250 : 2002, Section 8.4, it may be regarded as a Type LR (low resistance) membrane.

6.2 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.

6.3 The risk of condensation is highest, when used without ventilation, in new-build construction during the first heating period, where there is high moisture loading due to wet trades, such as in-situ cast concrete slabs or plaster. 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*.

6.4 All penetrations into the roof space must be properly sealed and loft hatches well sealed (see section 3.6) in accordance with the Certificate holder's instructions which includes 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.

6.5 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.

6.6 When tight-fitting roof coverings are used, the batten cavity should be ventilated with low- and high-level ventilation to allow water vapour to disperse.

6.7 For additional protection, the use of a vapour control layer/vapour check plasterboard can be considered.

## 7 Wind loading

7.1 Project design wind speeds should be determined and wind uplift forces calculated, in accordance with BS 6399-2 : 1997.

7.2 When unsupported, wind loading on the underlay should be calculated in accordance with BS 5534 : 2003, Section 5.5.2.7. For acceptable wind loads with specific batten spacings for the draped product, using a 25 mm deep tiling batten, see section 16, Table for *Physical properties – general*.

## 8 Strength

The product will resist the loads associated with installation of the roof (see section 16, Table for *Physical properties – directional*).

## 9 Properties in relation to fire

9.1 The product will melt and shrink away from heat, but will burn in the presence of a naked flame. The product is classified in accordance with EN 13501-1 : 2007 as a Class E material.

9.2 When the product is used unsupported, there is a risk that fire can spread if it is accidentally 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 the material becoming ignited.

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

## 10 Maintenance

As the product is confined to the roof space and it has suitable durability (see section 11), there are no maintenance requirements. However, it must be ensured that damage occurring before the enclosure is repaired (see section 14).

## 11 Durability



The product will be virtually unaffected by the normal conditions found in a roof space and will have a life comparable with that of traditional roof tile underlays, provided they are not exposed to sunlight for long periods (see section 12.4). Advice regarding exposure can be obtained from the Certificate holder.

# Installation

## 12 General

12.1 Spirtech 100 — for use in cold pitched roofs must be installed and fixed in accordance with the Certificate holder's instructions provisions of this Certificate and the relevant recommendations of BS 5534 : 2003 and BS 8000-6 : 1990. Installation can be carried out under all conditions normal to roofing work.

12.2 The product is installed with the printed side uppermost and lapped to shed water out and down the slope.

12.3 Overlaps should not be sealed and must be provided with the minimum dimensions given in Table 1.

Roof pitch (°)	Horizontal lap (mm)		Vertical laps (mm)
	Not fully supported	Fully supported	
12.5 to 14	225	150	100
15 to 34	150	100	100
35+	100	75	100

12.4 Where possible, eaves guards (for example Redland Underlay Support Tray) should be used to protect the product from sunlight and to direct water into the gutter.

12.5 Hips should be covered with a 600 mm wide strip of the product.

## 13 Procedure

### Draped and loose laps

13.1 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.

13.2 When used above a well-sealed ceiling, high-level loft space ventilation to a minimum value of 5000 mm<sup>2</sup> per metre run is required. Dry-fix ridge ventilation is recommended, alternatively, ventilation tiles can also be used.

13.3 When used above a ceiling that is not well-sealed, low-level loft space ventilation to a minimum value of 10000 mm<sup>2</sup> per metre run and in addition 5000 mm<sup>2</sup> of high-level ventilation is also required.

13.4 When fibre-cement or metal roofing sheets are used, low-level batten space ventilation to a minimum value of 25000 mm<sup>2</sup> per metre run and in addition 5000 mm<sup>2</sup> of high-level ventilation is also required to ventilate the batten space.

### Sarking boards

13.5 When used on sarking boards, the underlay and sarking board are left 30 mm short of the ridge apex. The underlay is laid directly onto the sarking board and a counter batten fixed above it.

## 14 Repair

Damage to the underlay can be repaired easily prior to the installation of slates or tiles by replacing the damaged areas, by patching and sealing correctly. Care should be taken to ensure that the watertightness of the roof is maintained.

## 15 Finishing

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

15.2 To achieve a convection-tight loft space, it is important that the following details are maintained (see also section 6.5).

- all penetrations, eg pipework, electrical fittings to the loft space, must be sealed
- the loft hatch must be securely sealed to ensure a draught-free fit
- the mineral wool insulation must be pushed into the eaves and against the underlay to avoid gaps and ensure cold-bridging is minimised.

15.3 The tiling and slating must be carried out in accordance with the relevant Clauses of BS 5534 : 2003, BS 8000-6 : 1990 and the slating/tiling manufacturer's instructions, especially when using tightly-jointed slates or tiles.

## Technical Investigations

### 16 Tests

16.1 Samples of Spirtech 100 — for use in cold pitched roofs were obtained from the Certificate holder for testing. The results of the tests carried out by, or on behalf of, the BBA are summarised in Tables 2 and 3.

16.2 An examination was also made of test data on the following properties:

- length
- width
- mass per unit area.

### 17 Investigations

17.1 The manufacturing process was assessed, including the method adopted for quality control, and details were obtained of the quality and composition of the materials used.

17.2 Using computer modelling, example roofs were analysed for risk of condensation.

17.3 An assessment of slip resistance characteristics was carried out based on test data for a similar specification product.

**Table 2** *Physical properties — directional*

Test (units)	Mean result		Method <sup>(1)</sup>
	Longitudinal	Transverse	
Tensile strength (N per 50 mm) control aged <sup>(2)</sup>	214 175	132 116	DIN EN 13859-1 (100 mm min <sup>-1</sup> )
Elongation at break (%) control aged <sup>(2)</sup>	73 36	103 63	DIN EN 13859-1 (100 mm min <sup>-1</sup> )
Tear resistance — nail (N)	129	193	DIN EN 13859-1 (100 mm min <sup>-1</sup> )
Dimensional stability (%)	-0.9	+0.7	DIN EN 1107-1

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

(2) Ageing in accordance with Annex C of EN 13859-1 : 2004.

**Table 3** *Physical properties — general*

Test (units)	Mean result	Method <sup>(1)</sup>
Water vapour transmission at 25°C/75% RH (gm <sup>-2</sup> day <sup>-1</sup> )	1429	BS 3177
Vapour resistance (MNsg <sup>-1</sup> ) at 25°C/75% RH (gm <sup>-2</sup> day <sup>-1</sup> )	0.14	BS 3177
Resistance to water control aged <sup>(2)</sup>	class W1 class W1	DIN EN 13859-1
Low temperature flexibility (°C) <sup>(3)</sup>	≤ -20	DIN EN 1109
Resistance to wind loads (kPa) <sup>(4)</sup> batten spacing 330 mm batten spacing 300 mm batten spacing 250 mm batten spacing 200 mm	0.5 <sup>(5)</sup> 0.5 <sup>(5)</sup> 1.5 <sup>(5)</sup> 2.5 <sup>(5)</sup>	MOAT 69 : 4.2.1

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

(2) Ageing in accordance with Annex C of EN 13859-1 : 2004.

(3) Lowest temperature tested -20°C.

(4) Test carried out using 25 mm thick battens and a 600 mm rafter spacing.

(5) Maximum pressure achieved.

## Bibliography

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

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

BS 5534 : 2003 *Code of practice for slating and tiling (including shingles)*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

BS 8000-6 : 1990 *Workmanship on building sites — Code of practice for slating and tiling of roofs and claddings*

BS EN 490 : 2004 *Concrete roofing tiles and fittings for roof covering and wall cladding — Product specifications*

BS EN 1107-2 : 2001 *Flexible sheets for waterproofing — Determination of dimension stability — Plastic and rubber sheets for roof waterproofing*

BS EN 1304 : 1998 *Clay roofing tiles for discontinuous laying — Products definitions and specifications*

BS EN 13141-1 : 2004 *Ventilation for buildings — Performance testing of components/products for residential ventilation — Externally and internally mounted air transfer devices*

BS EN 13859-1 : 2005 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*

BS EN 60529 : 1992 *Specification for degrees of protection provided by enclosures (IP code)*

DIN EN 1107-1 : 1999 *Flexible sheets for waterproofing — Determination of dimension stability — Bitumen sheets for roof waterproofing*

DIN EN 1109 : 1999 *Flexible sheets for waterproofing — Bitumen sheets for roof waterproofing — Determination of flexibility at low temperature*

DIN EN 13859-1 : 2005 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*

## Conditions of Certification

### 18 Conditions

18.1 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.

18.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

18.3 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.

18.4 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.

18.5 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.