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**Agrément Certificate**

**11/4874**

Product Sheet 3

### ACTIS HCONTROL REFLEX+ AS REFLECTIVE VAPOUR CONTROL LAYER AND INSULATION

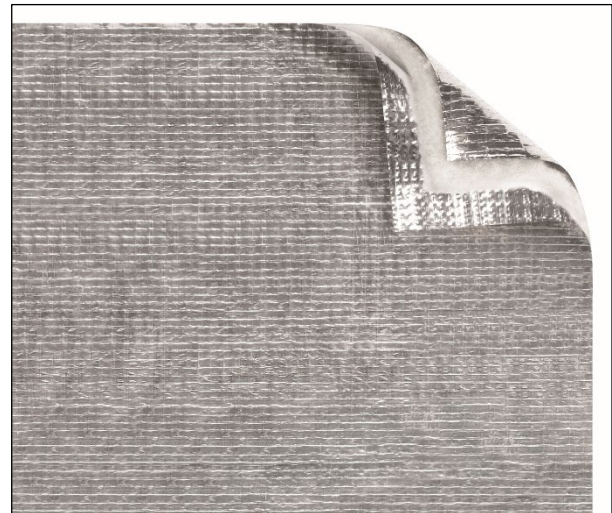
#### ACTIS HCONTROL REFLEX+ (FOR FLOORS)

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Actis HControl Reflex+ (for floors), for use as a reflective vapour control layer and insulation material for floors, in new and existing dwellings.

(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

**Thermal performance** — the product has an emissivity of 0.05 for the outer foil and a thermal resistance of  $0.25 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$  (see section 6).

**Condensation** — the product can provide effective control to the passage of water vapour (see section 7).

**Behaviour in relation to fire** — the product has not been classified to BS EN 13501-1 : 2018 (see section 9).

**Durability** — The product will have a life equivalent to that of the floor structure in which it is incorporated (see section 14).

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: 21 November 2022

Originally certificated on 29 November 2011

Hardy Giesler  
Chief Executive Officer

*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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

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

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## Regulations

In the opinion of the BBA, Actis HControl Reflex+ (for floors), 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)

<b>Requirement:</b>	<b>B3(4)</b>	<b>Internal fire spread (structure)</b>
Comment:		The product can contribute to satisfying this Requirement. See section 9.1 of this Certificate.
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:		The product can contribute to satisfying this Requirement. See sections 7.1 and 7.4 of this Certificate.
<b>Requirement:</b>	<b>L1(a)(i)</b>	<b>Conservation of fuel and power</b>
Comment:		The product can contribute to satisfying this Requirement, however, compensating fabric measures will be required. See sections 6.1 and 6.2 of this Certificate.
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
Comment:		The product is acceptable. See section 14 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>26</b>	<b>CO<sub>2</sub> emission rates for new buildings</b>
<b>Regulation:</b>	<b>26A</b>	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
<b>Regulation:</b>	<b>26A</b>	<b>Primary energy consumption rates for new buildings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26B</b>	<b>Fabric performance values for new dwellings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26C</b>	<b>Target primary energy rates for new buildings (applicable to England only)</b>
Comment:		The product can contribute to satisfying these Regulations; however, compensating fabric/services measures will be required. See sections 6.1 and 6.2 of this Certificate.



### The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)</b>	<b>Fitness and durability of materials and workmanship</b>
Comment:		The product can contribute to satisfying the requirements of this Regulation. See section 14 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	<b>2.4</b>	<b>Cavities</b>
Comment:		The product can contribute to satisfying this Standard, with reference to clause 2.4.2 <sup>(1)</sup> . See sections 9.1 and 9.3 of this Certificate.
Standard:	<b>3.15</b>	<b>Condensation</b>
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)</sup> , 3.15.4 <sup>(1)</sup> and 3.15.5 <sup>(1)</sup> . See sections 7.1 and 7.5 of this Certificate.
Standard:	<b>6.1(b)</b>	<b>Carbon dioxide emissions</b>
Comment:		The product can contribute to satisfying the requirements of this Standard, with reference to clauses 6.1.1 <sup>(1)</sup> and 6.1.6 <sup>(1)</sup> , however, compensating fabric and/or service measures will be required. See sections 6.1 and 6.2 of this Certificate.

Standard: Comment:	6.2	<b>Building insulation envelope</b> The product can contribute to satisfying the requirements of this Standard, with reference to clauses 6.2.1 <sup>(1)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.6 <sup>(1)</sup> to 6.2.11 <sup>(1)</sup> and 6.2.13 <sup>(1)</sup> of these Standards, however, compensating fabric measures will be required. See sections 6.1 and 6.2 of this Certificate.
Standard: Comment:	7.1(a)(b)	<b>Statement of sustainability</b> The product can contribute to satisfying 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. See sections 6.1 and 6.2 of this Certificate.
Regulation: Comment:	<b>12</b>	<b>Building standards applicable to conversions</b> 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 <sup>(1)</sup> and Schedule 6 <sup>(1)</sup> .

(1) Technical Handbook (Domestic).



## The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation: Comment:	<b>23(1)(a)(i)</b> <b>(iii)(b)(ii)</b>	<b>Fitness of materials and workmanship</b> The product is acceptable. See section 14 and the <i>Installation</i> part of this Certificate.
Regulation: Comment:	<b>29</b>	<b>Condensation</b> The product can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation: Comment:	<b>35(4)</b>	<b>Internal fire spread - Structure</b> The product can contribute to satisfying this Regulation. See section 9.1 of this Certificate.
Regulation: Comment:	<b>39(a)(i)</b>	<b>Conservation measures</b> The product can contribute to satisfying this Regulation, however, compensating fabric measures will be required. See sections 6.1 and 6.2 of this Certificate.
Regulation: Regulation: Comment:	<b>40(2)</b> <b>43B</b>	<b>Target carbon dioxide emission rate</b> <b>Nearly zero-energy requirements for new buildings</b> The product can contribute to satisfying these Regulations, however, compensating fabric and/or services measures will be required. See sections 6.1 and 6.2 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* (1.2), 3 *Delivery and site handling* (3.3) and 9 *Behaviour in relation to fire* (9.4 and 9.5) of this Certificate.

## Additional Information

### NHBC Standards 2022

In the opinion of the BBA Actis HControl Reflex+ (for floors), 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 5.2 *Suspended ground floors*.

## UKCA marking

The Certificate holder has taken the responsibility of UKCA marking the product, in accordance with Designated Standard BS EN 13984 : 2013 for its vapour control layer property.

## CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard EN 13984 : 2013 for its vapour control layer property.

## Technical Specification

### 1 Description

1.1 Actis HControl Reflex+ (for floors) is a reflective water vapour control layer (VCL) which also enhances the thermal resistance of unventilated air gaps adjacent to it. It can also be used as an air barrier (see section 10). The product consists of three separate elements: two reinforced aluminised coated films and one polyester fibre wadding.

1.2 The nominal characteristics of the product are shown in Table 1.

*Table 1 Nominal characteristics*

Characteristic (unit)	Value
Nominal thickness (mm)	8.5
Nominal weight (g·m <sup>-2</sup> )	335
Roll length (m)	12.5 and 31.25
Width (mm)	1600
Area (m <sup>2</sup> )	20 and 50

1.3 The Certificate holder recommends the following ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- pre-treated timber battens
- staples and/or nails
- additional insulation materials
- Actis Isodhesif Tape
- cavity barriers
- floor decking.

### 2 Manufacture

2.1 The outer layers of the product consist of non-woven polyester fabric adhesively laminated to a low emissivity foil film, coated to protect the reflective surface. The layers of foil/polyester wadding/foil are fastened together by three strips of glue, one on each edge and one in the centre.

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.

### 3 Delivery and site handling

3.1 The product is wrapped in plastic packaging and delivered to site as rolls on pallets. Each roll is labelled with the product name and its type, weight and dimensions and the names of the manufacturer and Certificate holder.

3.2 The product should be stored in clean, dry conditions, preferably under cover, and not in direct sunlight. Care must be taken to store the product away from solvents. The product must not be used if allowed to get wet or if damaged.

3.3 The product must not come into contact with naked flames or other ignition sources.

3.4 On site, to ensure maximum performance of the product when installed, precautions must be taken to protect it from mud and dirt.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Actis HControl Reflex+ (for floors).

### Design Considerations

#### 4 General

4.1 Actis HControl Reflex+ (for floors) is a flexible reflective VCL used in conjunction with other insulation materials and floor decking to reduce the thermal transmittance (U value) of floors in new and existing dwellings (see the *Installation* part of this Certificate).

4.2 The product should not be installed where it is likely to come into contact with heat sources greater than 80°C.

4.3 Penetration of the product by services should be kept to a minimum, to limit possible penetration by water vapour.

4.4 The product is installed on the joists before the floor finish is applied, to act as reflective insulation for the floor.

4.5 Suspended timber ground floors incorporating the product must include a damp-proof membrane (dpm), and/or suitable ventilation of the sub-floor as appropriate, laid in accordance with the relevant clauses of CP 102 : 1973.

4.6 The floor finish should be installed in accordance with BS EN 12871 : 2013.

#### 5 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

## 6 Thermal performance



6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2019 using the following values:

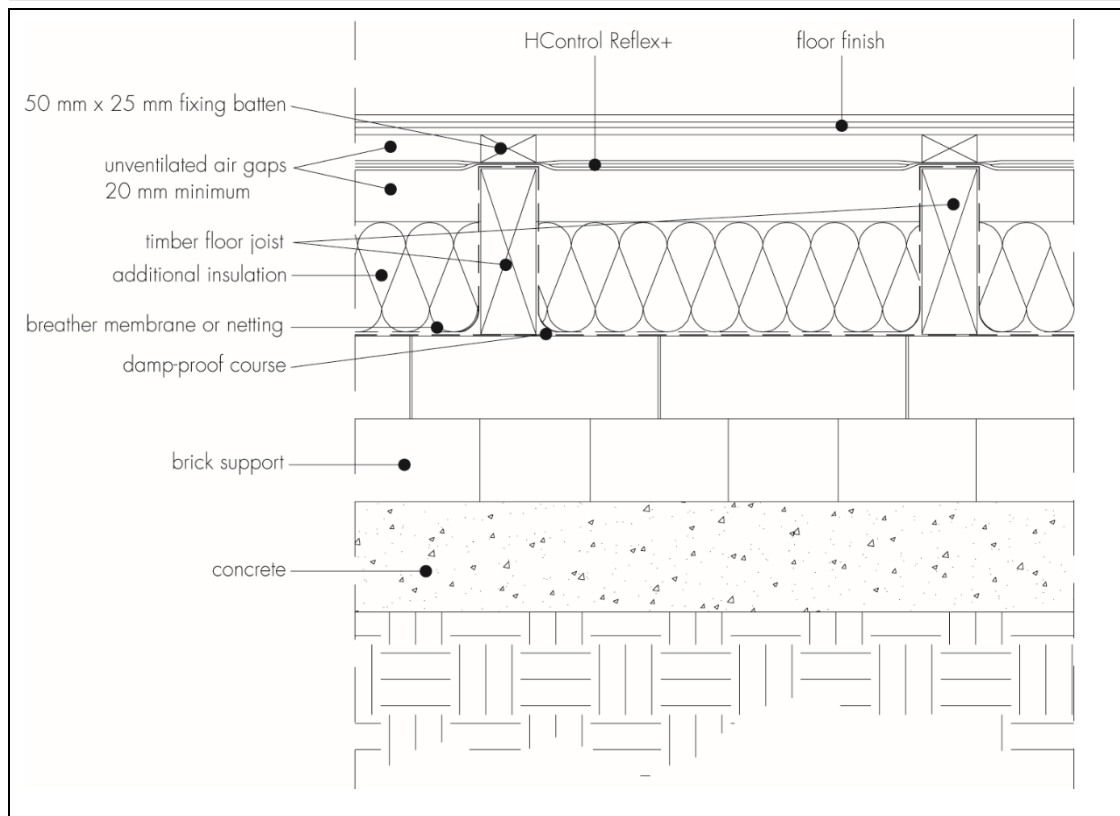
- $0.25 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$  — thermal resistance value for Actis HControl Reflex+ (for floors) (8.5 mm thick) with no air gaps either side
- 0.05 — outer surface emissivity
- $0.66^{(1)} \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$  — thermal resistance value of an air cavity of 20 mm thick, adjacent to the product (downwards heat flow)
- $0.00 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$  — thermal resistance<sup>(2)</sup> value for the product when compressed between joists and battens.

(1) Unventilated cavity with a width and length at least 10 times the thickness and one high emissivity surface.

(2) This is a default value. For guidance on U value calculations refer to BBA Information Bulletin No 3.

6.2 The U value of a completed element will depend largely on the thickness and conductivity of the additional insulation used and the extent and arrangement of timber bridging. An example floor construction is shown in Figure 1 and the resulting U values are shown in Table 2.

Figure 1 Example floor construction



**Table 2 U values for floor construction**

P/A ratio	U value (timber suspended floor) ( $W \cdot m^{-2} \cdot K^{-1}$ )
0.2	0.13
0.4	0.15
0.6	0.16
0.8	0.16
1.0	0.16

Note: example construction

22mm chipboard flooring - thermal conductivity  $\lambda$  of  $0.18 W \cdot m^{-1} \cdot K^{-1}$ , with 11% timber bridging - thermal conductivity  $\lambda$  of  $0.13 W \cdot m^{-1} \cdot K^{-1}$ , Actis HControl Reflex+ laid over joist, leaving a 20 mm gap (Thermal resistance =  $0.66 m^2 \cdot K \cdot W^{-1}$ ) above the foil, and 61.5 mm (Thermal resistance =  $1.605 m^2 \cdot K \cdot W^{-1}$ ) gap below it, enclosed by 80 mm of additional insulation with a thermal conductivity  $\lambda_0$  of  $0.020 W \cdot m^{-1} \cdot K^{-1}$  and an emissivity of  $\epsilon = 0.2$ .

## Junctions

6.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

## 7 Condensation

### Interstitial condensation



7.1 Floors incorporating the product will adequately limit the risk of interstitial condensation when designed and constructed in accordance with BS 5250 : 2021 (Sections 10 and 13), and all laps and joints are adequately sealed. The products water vapour resistance may be taken as  $600 MN \cdot s \cdot g^{-1}$ .

7.2 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 DG 369 : 1992 and BRE Report BR 262 : 2002.

7.3 When using this type of product, due consideration must be taken of the overall installation to minimise perforations by services, eg power cables, pipes etc, and the joints at skirting level must be well sealed.

### Surface condensation



7.4 In England and Wales, floors incorporating the product will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.70 W \cdot m^{-2} \cdot K^{-1}$  at any point and the junctions with walls are designed in accordance with the guidance referred to in section 6.3 of this Certificate.



7.5 In Scotland, floors will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $1.2 W \cdot m^{-2} \cdot K^{-1}$  at any point. Guidance may be obtained from BS 5250 : 2021 and BRE Report BR 262 : 2002.

## 8 Infestation

The use of the product does not in itself promote infestation. The creation of voids may provide habitation for insects or rodents in areas already infested. Care should be taken to ensure that, wherever possible, all voids are sealed as any infestation may be difficult to eradicate. There is no food value in the materials used.

## 9 Behaviour in relation to fire

9.1 The product has not been classified in accordance with BS EN 13501-1 : 2018. Where the product forms the face of a cavity, the spacing of cavity barriers is restricted by the documents supporting the national Building Regulations.

9.2 In Scotland, the product does not achieve the minimum Class F reaction to fire classification to BS EN 13501-1 : 2018 required by Technical Handbook (Domestic), clause 2.4.2, so designers should seek guidance on the proposed use of the product from the relevant building control body.

9.3 When installed with other additional insulation or other materials, the fire properties of these materials must be taken into consideration.

9.4 The product will melt and shrink away from heat, but will burn in the presence of a naked flame. When used unsupported, there is a risk that fire can spread if it is accidentally ignited during maintenance works, eg by a plumber's torch. Care should be taken during building and maintenance to avoid the material being ignited.

## 10 Air leakage

10.1 When the product was tested to BS EN 12114 : 2000 with a positive pressure of 100 Pa, no airflow was detected and hence it was found to be airtight.

10.2 When used as a VCL and an air barrier, the product's effectiveness is reliant on the careful sealing of the laps, joints, perimeters and penetrations, in accordance with the Certificate holder's instructions.

10.3 The airtightness of the building will also be dependent on the performance of the other building elements.

## 11 De-rating of electrical cables

As with other insulation products, it may be necessary in some cases to de-rate electrical cables buried in insulation. BS 7671 : 2018 suggests that, where wiring is completely surrounded by insulation, it may need to be de-rated to as low as half its free air current carrying capacity. Guidance should be sought from a qualified electrician.

## 12 Proximity of flues and appliances

Detailed guidance can be found in the documents supporting the national Building Regulations for the provisions that are applicable when the product is installed in close proximity to certain flue pipes and/or heat-producing appliances.

## 13 Maintenance

As the product is confined within a floor structure and has suitable durability (see section 14), maintenance is not required.

## 14 Durability



The product will have a life equivalent to that of the floor structure in which it is incorporated.

## Installation

### 15 General

15.1 The design data given in this Certificate is based on the assumption that construction and fastening methods and other details given in this Certificate are followed, as well as the Certificate holder's installation instructions.

15.2 All VCL joints should have an overlap of at least 50 mm.

15.3 The product is fastened with corrosion-resistant nails or staples with a minimum length of 10 mm. Maximum nail or staple distance along the edges is 100 mm. After fixing, the overlaps are covered by Actis Isodhesif Tape, to maximise the vapour tightness of the VCL.



15.4 The installation of the joints around openings such as ventilation pipes should be completed with adhesive tape to maximise the vapour tightness of the VCL. Particular attention should be paid to fastening of penetrations through the product acting as a VCL.

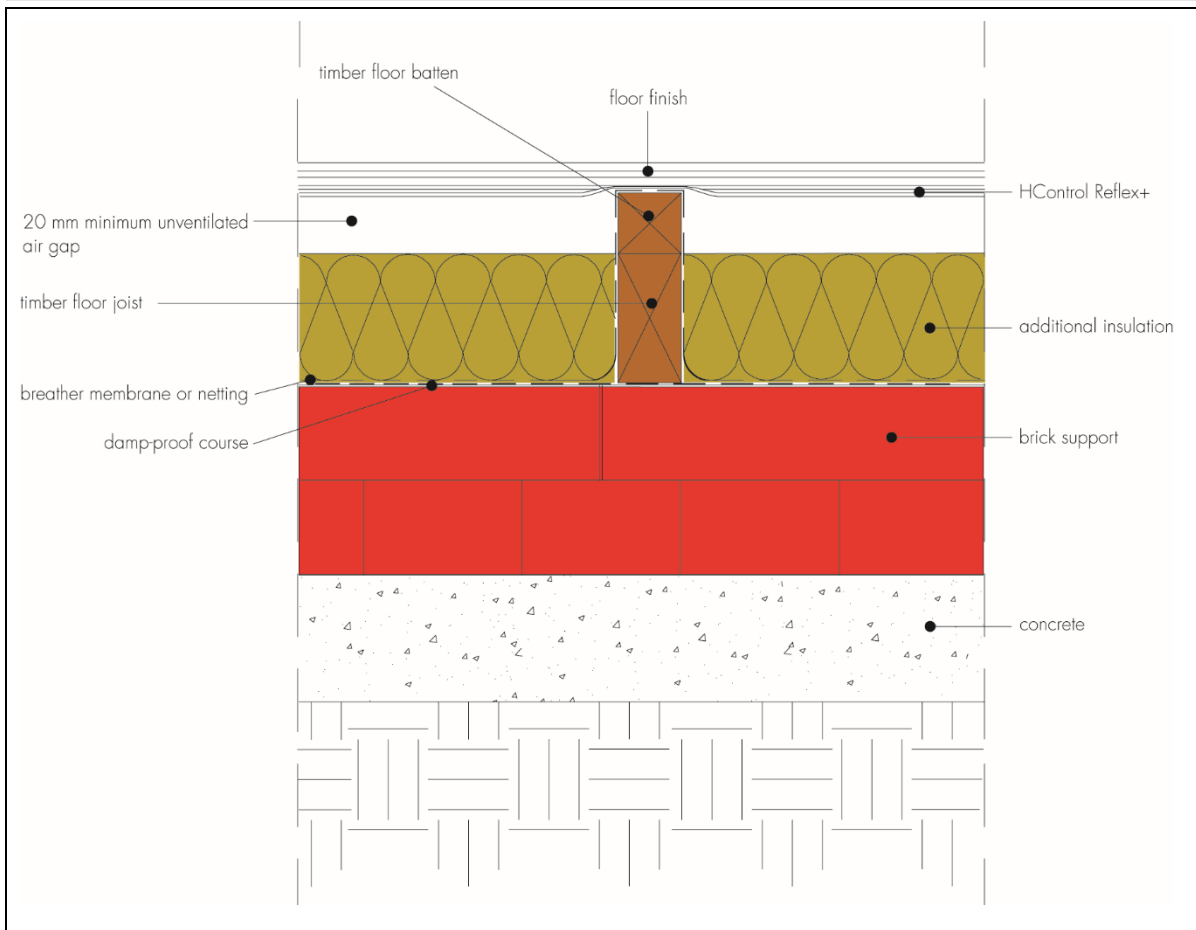
## 16 Procedure

### New floors

16.1 The product is installed on timber structures using corrosion-resistant nails or staples. The product should be installed with two unventilated air gaps as shown in Figure 1.

16.2 In situations where the existing insulation already fills the joist depth, the product can be installed with only one unventilated air gap, as shown in Figure 2. The floor finish is then fixed onto the battens over the joists.

Figure 2 Floor installation with one unventilated air gap



### Existing floors

16.3 Once the floor finish is removed, the product should be fixed with either one air gap or two air gaps depending on the existing insulation (see Figures 1 and 2).

16.4 When battens are to be added to create two air gaps, consideration should be given to alterations that would be required to the rest of the structure of the room, such as door levels etc.

### Additional insulation

16.5 When the product is used with other additional insulation materials, care should be taken to ensure that all air gaps are maintained in accordance with the instructions of the manufacturer of such materials, and further advice should be sought from the Certificate holder.

### 17 Tests

Test were carried out by the BBA on the outer surfaces of Actis HControl Reflex+ (for floors) to determine emissivity before and after ageing.

### 18 Investigations

18.1 The following investigations were carried out on the product, based on independent test data and BBA analysis, to determine:

- dimensions
- water tightness
- air permeability
- water vapour resistance
- tensile strength
- elongation
- resistance to tearing
- resistance to impact
- joint strength
- water vapour resistance after ageing
- core thermal resistance
- emissivity
- durability checks after ageing
- calculation of thermal resistance of air gaps adjacent to the product in its different applications
- U value calculations and condensation risk analysis.

18.2 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

BRE Digest DG 369 : 1992 *Interstitial condensation and fabric degradation*

BRE Report BR 262 : 2002 *Thermal insulation: avoiding risks*

BRE Report BR 443 : 2019 *Conventions for U-value calculations*

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

BS 7671 : 2018 + A1 : 2020 *Requirements for electrical installations — IET Wiring Regulations*

BS EN 12114 : 2000 *Thermal performance of buildings — Air permeability of building components and building elements — Laboratory test method*

BS EN 12871 : 2013 *Wood-based panels — Determination of performance characteristics for load bearing panels for use in floors, roofs and walls*

BS EN 13501-1 : 2018 *Fire classification of construction products and building elements – Classification using data from reaction to fire tests*

BS EN 13984 : 2013 *Flexible sheets for waterproofing — Plastic and rubber vapour control layers — Definitions and characteristics*

BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

### 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.