

## ROCKWOOL Ltd

Wern Tarw  
Pencoed  
Bridgend CF35 6NY

Tel: 01656 862621

e-mail: [technical.solutions@rockwool.co.uk](mailto:technical.solutions@rockwool.co.uk)

website: [www.rockwool.co.uk](http://www.rockwool.co.uk)



## Agrément Certificate

21/5878

Product Sheet 1

### ROCKWOOL INSULATION SYSTEMS

### ROCKWOOL HARDROCK MULTI-FIX (DD)

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to ROCKWOOL HARDROCK<sup>(2)</sup> Multi-Fix (DD), insulation boards for use as a thermal insulation layer and to create or improve falls on limited access concrete, timber or metal flat roof decks, in new or existing domestic and non-domestic buildings. They are for use in conjunction with a vapour control layer and mechanically or adhesively fixed roof waterproofing systems.

(1) Hereinafter referred to as 'Certificate'.

(2) HARDROCK is a registered trade name.

#### 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 products have a declared thermal conductivity value ( $\lambda_D$ ) of  $0.039 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  (see section 6).

**Condensation risk** — the products can contribute to limiting the risk of condensation (see section 7).

**Strength and stability** — when installed on suitable substrates using appropriate fixing methods, the products can adequately transfer maintenance traffic loads and wind loads to the roof deck (see section 8).

**Behaviour in relation to fire** — the overall fire rating of any roof containing the products will depend on the type of deck and the nature of the roof waterproof covering (see section 9).

**Durability** — the products, when used as thermal insulation in the roof system described in this Certificate, will have a life at least as long as that of the roof waterproof covering (see section 11).



The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 8 April 2021

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.*

#### British Board of Agrément

Bucknalls Lane  
Watford  
Herts WD25 9BA

©2021

tel: 01923 665300  
[clientservices@bbacerts.co.uk](mailto:clientservices@bbacerts.co.uk)  
[www.bbacerts.co.uk](http://www.bbacerts.co.uk)

## Regulations

In the opinion of the BBA, ROCKWOOL HARDROCK Multi-Fix (DD), 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>A1</b>	<b>Loading</b>
Comment:		The products can contribute to satisfying this Requirement. See section 8.1 of this Certificate.
<b>Requirement:</b>	<b>B4(2)</b>	<b>External fire spread</b>
Comment:		Roofs incorporating the products can contribute to satisfying this Requirement. See sections 9.1 to 9.4 of this Certificate.
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:		The products 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 products can contribute to satisfying this Requirement. See sections 6.1 and 6.2 of this Certificate.
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
Comment:		The products are acceptable. See section 11 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>
Comment:		The products can contribute to satisfying these Regulations. 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>Durability, workmanship, and fitness of materials</b>
Comment:		The products are acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	<b>1.1</b>	<b>Structure</b>
Comment:		The products can contribute to satisfying this Standard, with reference to clauses 1.1.1 <sup>(1)(2)</sup> , 1.1.2 <sup>(1)(2)</sup> and 1.1.3 <sup>(1)(2)</sup> . See section 8.1 of this Certificate.
Standard:	<b>2.8</b>	<b>Spread from neighbouring buildings</b>
Comment:		Roofs incorporating the products can contribute to satisfying this Standard, with reference to clause 2.8.1 <sup>(1)(2)</sup> . See sections 9.1 to 9.3 of this Certificate.
Standard:	<b>3.15</b>	<b>Condensation</b>
Comment:		The products can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)(2)</sup> , 3.15.3 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> , 3.15.5 <sup>(1)(2)</sup> and 3.15.6 <sup>(1)(2)</sup> . See sections 7.1 and 7.5 of this Certificate.

Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:	The products can contribute to satisfying these Standards, with reference to clauses, or parts of, 6.1.1 <sup>(1)</sup> , 6.1.2 <sup>(2)</sup> , 6.1.6 <sup>(1)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(2)</sup> , 6.2.5 <sup>(2)</sup> , 6.2.6 <sup>(1)</sup> , 6.2.7 <sup>(1)</sup> , 6.2.8 <sup>(1)(2)</sup> , 6.2.9 <sup>(1)(2)</sup> , 6.2.10 <sup>(1)(2)</sup> , 6.2.11 <sup>(1)(2)</sup> , 6.2.12 <sup>(2)</sup> and 6.2.13 <sup>(1)(2)</sup> . See sections 6.1 and 6.2 of this Certificate.	
Standard:	7.1(a)(b)	Statement of sustainability
Comment:	The products 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. In addition, the products can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 <sup>(1)(2)</sup> [Aspects 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ], 7.1.6 <sup>(1)(2)</sup> [Aspects 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ] and 7.1.7 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> ]. See section 6.1 of this Certificate.	
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:	Comments made in relation to the products under Regulation 9, Standards 1 to 6, 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) 2012 (as amended)

<b>Regulation:</b>	<b>23</b>	<b>Fitness of materials and workmanship</b>
Comment:	The products are acceptable. See section 11 and the <i>Installation</i> section of this Certificate.	
<b>Regulation:</b>	<b>29</b>	<b>Condensation</b>
Comment:	The products can contribute to satisfying this Regulation. See section 7.1 of this Certificate.	
<b>Regulation:</b>	<b>30</b>	<b>Stability</b>
Comment:	The products can contribute to satisfying this Regulation. See section 8.1 of this Certificate.	
<b>Regulation:</b>	<b>36(b)</b>	<b>External fire spread</b>
Comment:	Roofs incorporating the products can contribute to satisfying this Regulation. See sections 9.1 to 9.4 of this Certificate.	
<b>Regulation:</b>	<b>39(a)(i)</b>	<b>Conservation measures</b>
<b>Regulation:</b>	<b>40(2)</b>	<b>Target carbon dioxide emission rate</b>
Comment:	Roofs incorporating the products can satisfy these Regulations. 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: 3 *Delivery and site handling* (3.3) and 12 *General* (12.9) of this Certificate.

## Additional Information

### NHBC Standards 2021

In the opinion of the BBA, ROCKWOOL HARDROCK Multi-Fix (DD), 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 7.1 *Flat roofs, terraces, and balconies*.

### CE marking

The Certificate holder has taken the responsibility of CE marking the products in accordance with harmonised European Standard BS EN 13162 : 2012.

## Technical Specification

### 1 Description

1.1 ROCKWOOL HARDROCK Multi-Fix (DD) comprises mineral wool fibre boards with or without a mineral-coated glass fibre tissue facing on the upper face. The range of products and their nominal characteristics are given in Table 1.

Table 1 Nominal characteristics

Product	Facings	Length x width (mm)	Thicknesses (mm)		
Hardrock Multi-Fix (DD)	mineral-coated glass fibre tissue on the upper face	1200 x 1000	60, 85, 105, 115, 150, 170, 185		
Hardrock Multi-Fix (DD) base board	Plain – no facers	1200 x 1000	120, 150, 160, 170		
Hardrock Multi-Fix (DD) tapered roof system	mineral-coated glass fibre tissue on the upper face	1200 x 1000	Thicknesses (mm)		
			1 : 40 fall	1 : 60 fall	1 : 80 fall
			70 - 100	60 - 80	70 - 85
			100 - 130	80 - 100	85 - 100
			130 - 160	100 - 120	100 - 115
				120 - 140	115 - 130
				140 - 160	130 - 145
		145 - 160			

1.2 The products are installed as part of a roof system in conjunction with the following items (which are outside the scope of this Certificate):

- roofing deck
- vapour control layer (VCL)
- partially bonded built-up reinforced bitumen waterproofing membranes
- single-ply waterproofing membranes - subject to a current BBA Agrément Certificate
- liquid waterproofing systems - subject to a current BBA Agrément Certificate
- adhesives and/or mechanical fixings.

### 2 Manufacture

2.1 ROCKWOOL stone wool insulation is produced from molten rock by a controlled spinning process.

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 ROCKWOOL Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 (Certificate FM 02262).

### 3 Delivery and site handling

3.1 The products are delivered to site on a pallet and wrapped in polythene. Each pack carries a label bearing the manufacturer's name, product description and the BBA logo incorporating the number of this Certificate.

3.2 The boards should be stored clear of the ground, on a clean, level surface and preferably under cover to protect them from prolonged exposure to moisture or mechanical damage. Boards should be stored under cover until required for use.

3.3 Dust masks, gloves and long-sleeved clothing should be worn during cutting and handling of the boards.

3.4 Damaged, contaminated or wet products must not be used.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Hardrock Multi-Fix (DD).

### Design Considerations

#### 4 Use

4.1 ROCKWOOL HARDROCK Multi-Fix (DD) roof insulation boards are suitable for use as a fully supported thermal insulation layer on flat roofs, including protected zero falls (see section 4.6) with concrete, timber, and profiled metal roof decks, in conjunction with suitable roof waterproofing membrane systems (see section 4.4), with limited access only (see section 4.5). The ROCKWOOL HARDROCK Multi-Fix (DD) tapered roof system can be used to create a fall to an existing or a new build flat roof.

4.2 Decks should be designed in accordance with the relevant clauses of either BS 6229 : 2018 or BS EN 13956 : 2012 and, where appropriate, NHBC Standards 2021, Chapter 7.1.

4.3 Roofs should incorporate a VCL below the products which is compatible with the products and the waterproofing system. Advice should be sought from the Certificate holder.

4.4 The products must either be adhesively bonded to the VCL or mechanically fixed to the roof deck (see section 8), and are for use in conjunction with a suitable roof waterproofing system (as given in Table 2).

Table 2 Application

	Insulation fixing method		
	PU adhesive	Hot bitumen torch-on	Mechanical fixing
Partially bonded built-up reinforced bitumen membranes, in accordance with the recommendations of Table 5 of BS 8747 : 2007 and installed in accordance with BS 8217 : 2005	✓	✓	✓
Single-ply waterproof membranes which are the subject of a current BBA Agrément Certificate and laid in accordance with that Certificate	✓	×	✓
Liquid waterproofing systems which are the subject of a current BBA Agrément Certificate and laid in accordance with that Certificate	✓	×	✓

4.5 Limited access roofs are defined for the purpose of this Certificate as those roofs subject only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc.

4.6 For the purposes of this Certificate, flat roofs are defined as those roofs having a minimum finished fall of 1:80 (0.7°) and a maximum of 1:6 (10°), as defined in BS 6229 : 2018. Zero fall roofs are defined as those roofs having a finished fall of less than 1:80.

4.7 For design purposes on flat roofs, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflections, direction of falls etc.

4.8 ROCKWOOL HARDROCK Multi-Fix (DD) tapered insulation boards may be used where appropriate, to achieve the minimum finished falls between 1:80 and 1:6.

Figure 1 Tapered insulation – ROCKWOOL HARDROCK Multi-Fix (DD) tapered roof system



4.9 On zero fall flat roofs, it is particularly important to identify the correct drainage points to ensure that drainage provided is effective. Reference should be made to the appropriate clauses of the LRWA Guidance Note No 7 – *Specifier guidance for flat roof falls*, which generally requires surface drainage falls in most situations.

## 5 Practicability of installation

The products are designed to be installed by a competent general builder, or a contractor, experienced with these types of products.

## 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 declared thermal conductivity ( $\lambda_D$ ) value of  $0.039 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ .

6.2 The U value of a completed roof will depend on the thickness of insulation used, the type of fixings and the insulating value of other roof components/layers. Example U values of roofs incorporating the products are shown in Table 3.

Table 3 Example U values

U value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Insulation thickness <sup>(1)</sup> (mm)		
	Concrete deck <sup>(2)</sup>	Timber deck <sup>(3)</sup>	Metal deck <sup>(4)</sup>
0.13	170 + 115	120 + 150	170 + 115
0.15	160 + 85	150 + 85	150 + 105
0.16	150 + 85	120 + 105	150 + 85
0.18	120 + 85	120 + 85	150 + 60
0.20	185	170	185
0.25	150	150	150

- (1) Nearest available thickness. Includes one stainless steel ( $\lambda = 17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) insulation fixing per m<sup>2</sup> with a 4.8 mm cross-sectional diameter.  
 (2) 150 mm concrete decking ( $\lambda = 1.33 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), VCL, insulation and an adhered 1.5 mm waterproofing membrane.  
 (3) 12.5 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), VCL, 150 mm timber joists (12.5%)/ air cavity (87.5%), 18 mm OSB decking ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), VCL, insulation and an adhered 1.5 mm waterproofing membrane.  
 (4) 0.7 mm metal deck ( $\lambda = 50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), VCL, insulation and an adhered 1.5 mm waterproofing membrane.

## 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 risk

### Interstitial condensation



7.1 Roofs will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011 Annexes D and H, and the relevant guidance.

7.2 The products have a nominal vapour resistivity ( $\mu$ ) of 1, with or without facings.

7.3 To minimise moisture entering the roof, a VCL should be used, with the joints lapped and sealed, which should be turned up around the insulation and bonded to the waterproofing finish. In the case of single-ply roofing membranes, the recommendations in the latest version of the *SPRA Design Guide* should be followed.

### Surface condensation



7.4 Roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.35 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point, and the junctions with other elements are designed in accordance with guidance referred to in section 6.3 of this Certificate.



7.5 For buildings in Scotland, constructions will be acceptable where the thermal transmittance (U value) does not exceed  $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point, and the junctions with other elements are designed in accordance with the guidance referred to in BS 5250 : 2011, Annex H. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.3 of this Certificate.

## 8 Strength and stability



8.1 When installed on suitable flat roof decks, using appropriate fixing methods, the products can adequately transfer maintenance traffic loads and negative and positive (suction and pressure) wind loads to the roof deck.

8.2 For adhesive application of the insulation products, the substrate must be dry and free from dust, and installation should be in accordance with the instructions of the adhesive manufacturer. The surface of the substrate must have sufficient cohesive strength to resist the calculated wind load acting upon the structure.



8.3 When adhering is the chosen method for the insulation or waterproofing, adhesion between the insulation product and VCL, and between the product and overlay, must be adequate to resist the effects of wind suction and thermal cycling likely to be experienced under normal conditions. In areas where high wind speeds can be expected, additional mechanical fixings should be considered; the advice of a suitably qualified and experienced individual should be sought as to the method of fixing as defined in the relevant clauses of BS EN 1991-1-4 : 2005 and its UK National Annex.

8.4 The roof construction or immediate substrate to which the boards are fixed, must be structurally sound and have sufficient strength and stability to resist all dead, imposed and wind loads. It must also have adequate resistance to the pull-out forces created by the wind forces acting on the specified fixings used.

8.5 The suitability of the roof construction – and in particular the immediate substrate – to accept the adhesive bond or any specified mechanical fixings, must be checked before installation by carrying out in-situ pull-out or pull-through testing to determine the maximum safe working load the fixings can resist. The advice of the Certificate holder should also be sought in respect of suitable mechanical fixings.

8.6 The type and number of fixings will depend on the roof construction and location; the Certificate holder's advice should be sought in this respect. The Certificate holder recommends a minimum of one fixing per board, and a minimum washer/stress plate of 70 by 70 mm, or 75 mm diameter.

8.7 All design analysis must be in accordance with British or European Standards relevant to the construction. All calculations should be carried out by a suitably qualified and experienced individual.

8.8 Fixings installed along the edges or at corners of boards should be situated between 50 and 150 mm from the board edge.

8.9 For design purposes, the boards may be assumed to have an allowable compressive strength of 70 kPa at 10% compression.

8.10 Roof waterproof covering systems (see Table 2 for suitable types) must be applied in accordance with the relevant BBA Agrément Certificates and the Certificate holder's instructions.

8.11 The products have not been assessed for use with permanent distributed or concentrated loads, such as air conditioning units, mechanical plants, water tanks, etc. Such loads should be supported directly on the roof construction. The products are not suitable when permanent roof access is required.

8.12 When profiled metal decking is used, the boards must be installed with the long edge at right angles to the profiles. Where possible, butt joints should occur on a crown.

8.13 When maintenance is required to the roof waterproofing, protective boarding should be laid over the roof surface to avoid concentrations of load.

## 9 Behaviour in relation to fire



9.1 The products have a Euroclass A1 (unfaced)<sup>(1)</sup> or A2-s1, d0 (faced)<sup>(2)</sup> reaction-to-fire classification in accordance with BS EN 13501-1 : 2018. Copies of the reports shown below can be obtained from the Certificate holder.

(1) MPA NRW - report no. 230011722-8. 15.11.2018.

(2) MPA NRW - report no. 231000681-7. 01.07.2020.

9.2 The products, in isolation, are unrestricted in terms of proximity to a boundary. See also section 9.3 of this Certificate.

9.3 The overall fire rating of any roof containing the products will depend on the type of deck and the nature of the roof waterproof covering. These specifications should therefore be evaluated by reference to the requirements of the documents supporting the relevant national Building Regulations and any consequent restrictions imposed by those documents, on a case-by-case basis. In the absence of a rating, the products should not be used within 20 metres of a boundary (24 metres in Scotland).





9.4 In Wales and Northern Ireland, designers may refer to the relevant documents supporting the national Building Regulations for certain roof specifications that can achieve a notional B<sub>ROOF(t4)</sub> designation without testing and are consequently unrestricted.

9.5 Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity barriers, service penetrations and combustibility limitations for other materials and components used in the overall construction.

## 10 Maintenance

The products, once installed, do not require any maintenance, and have suitable durability provided the roof waterproofing is inspected and maintained at regular intervals (see section 11).

## 11 Durability



The products are rot resistant and durable and will have a life at least as long as that of the roof waterproofing.

## Installation

### 12 General

12.1 ROCKWOOL HARDROCK Multi-Fix (DD) must be installed in accordance with the Certificate holder's instructions, BS 6229 : 2018, BS 8217 : 2005 and BS EN 13956 : 2012, and this Certificate.

12.2 Care should be taken to ensure the deck is graded to the correct fall and is dry, clean and free from any projections or gaps.

12.3 Any hollows, depressions or back falls found in the roof deck must be rectified prior to laying the insulation.

12.4 The suitability of the substrate deck to accept an adhesive bond or mechanical fixings must be checked prior to the work commencing.

12.5 The deck to which the VCL is to be applied must be even, dry, sound, and free from dust, grease and other defects which may impair the bond.

12.6 In areas where high wind speeds can be expected, additional mechanical fixings should be considered; the advice of a suitably qualified and experienced individual should be sought as to the method of fixing or defined in the relevant clauses of BS EN 1991-1-4 : 2005 and its UK National Annex.

12.7 The mechanical fixing frequency and pattern should be predetermined in accordance with the Certificate holder's instructions and the relevant clauses of BS EN 1991-1-4 : 2005. Each fixing should incorporate a square or circular plate countersunk washer, which must not restrain more than one board.

12.8 To prevent moisture being trapped on or in the insulation, it is essential to:

- protect the products during laying, before the application of the roof waterproofing, or lay the roof covering at the same time as laying the products.
- allow the products to fully dry out naturally if they are accidentally wetted, prior to applying the roof waterproofing.
- install the products only when the ambient temperature is above 5°C, to prevent condensation.

12.9 The boards can be cut with a sharp knife or fine-toothed saw and handled easily, although additional care may be required with the weight of thicker boards.

12.10 Where a double application of boards is required, the second layer should be installed offset from the first layer.

12.11 Tapered boards should be laid in accordance with the specific Certificate holder's layout drawing provided.

12.12 The VCL must be installed in accordance with the manufacturer's instructions for each deck type.

12.13 Once installed, access to the roof should be restricted in accordance with section 4.5 of this Certificate.

## **13 Procedure**

### **Timber decks (eg tongue-and-groove boards, plywood, OSB)**

13.1 A VCL is applied in accordance with the manufacturer's instructions.

13.2 The VCL should be laid with 150 mm minimum sealed laps, turned up around the insulation and sealed to the waterproof finish at all edges and penetrations such as roof lights, with detailing in accordance with the standards and guidance in sections 7.1 and 12.1. See section 7.3 in relation to single-ply roofing membranes.

13.3 The insulation boards are adhesively or mechanically fixed to the VCL and deck below in a brick-bonded pattern with the minimum number of mechanical fixings placed within the individual board. The actual number of mechanical fixings required to fix the board must be determined by a suitably qualified and experienced individual to suit the wind uplift requirements for the specific site in question.

13.4 Each fixing should have a minimum washer/stress plate of 70 by 70 mm, or 75 mm diameter. Fixings located along the edge or at corners of the boards should be situated no less than 50 mm and no more than 150 mm from the board edge. For non-bituminous VCLs, the fixings penetrating the VCL should be self-sealing. For bituminous VCLs, the nail heads should be blanked out with hot bitumen.

13.5 The roof waterproofing membrane is installed in accordance with the manufacturer's instructions.

### **Concrete decks**

13.6 Before applying the VCL, an appropriate levelling screed should be applied where necessary and be allowed to cure completely. The whole deck should be primed, if necessary, in accordance with the manufacturer's instructions. The advice of the Certificate holder should be sought in respect of a suitable primer and installation instructions.

13.7 The VCL is fully bonded to the primed concrete deck and the laps are sealed. The insulation boards and roof waterproofing membrane are then applied in the manner described for timber decks (see sections 13.3 to 13.5).

### **Metal decks**

13.8 Before applying the VCL, the deck should be primed, if necessary, in accordance with the manufacturer's instructions. The advice of the Certificate holder should be sought in respect of a suitable primer and installation instructions.

13.9 A reinforced VCL is fully bonded to the metal deck and the laps are sealed. The insulation boards and roof waterproofing membrane are then applied in the manner described for timber decks (see sections 13.3 to 13.5).

13.10 The insulation boards are laid with the long edges at right angles to the ribs, and all board ends must be fully supported on a rib.

13.11 The thickness of the roofboard used can depend on the width of the rib openings of the metal deck as given in Table 4. The deck profiles should give a bonding area of at least 33% of the total projected surface area.

Table 4 Trough widths

Insulation thickness (mm)	Maximum span (mm)	
	Board ends supported on profile tops	Board ends unsupported over troughs
60	180	120
85	255	170
105	300	210
115	300	230
120	300	240
150	300	300
160	300	300
170	300	300
185	300	300

## Technical Investigations

### 14 Investigations

14.1 An assessment was made of the results of test data relating to -:

- Thermal conductivity
- Density
- Dimensional stability
- Compressive strength
- Tensile strength
- Wind uplift
- Fire classification.

14.2 An assessment of the risk of interstitial condensation was made.

14.3 An assessment was made of typical constructions which achieve the design U values.

14.4 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 *Code of practice for control of condensation in buildings*

BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproof coverings — Code of practice*

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

BS 8747 : 2007 *Reinforced bitumen membranes (RBMs) for roofing — Guide to selection and specification*

BS EN 1991-1-4 : 2005 *Loading for buildings — Code of practice for wind loads*

UK NA to BS EN 1991-1-4 : 2005 UK National Annex to *Loading for buildings — Code of practice for wind loads*

BS EN 13162 : 2012 *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification*

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

BS EN 13956 : 2012 *Flexible sheets for waterproofing — Plastic and rubber sheets for roof waterproofing — Definitions and characteristics*

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

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

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

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

### 15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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.