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**Agrément Certificate**

**20/5845**

Product Sheet 1

### K-ROC RAINSCREEN SLAB

### K-ROC RAINSCREEN SLAB FOR USE IN RAINSCREEN CLADDING SYSTEMS

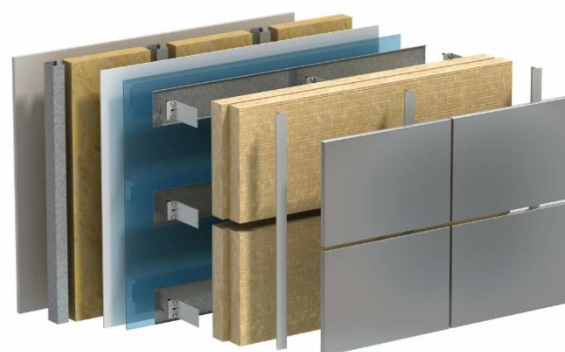
This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the K-Roc<sup>(2)</sup> Rainscreen Slab For Use In Rainscreen Cladding Systems, a mineral wool insulation slab for use as thermal insulation on new and existing timber- or steel-frame walls or masonry walls, in domestic and non-domestic buildings. The product is used in conjunction with ventilated cladding systems.

(1) Hereinafter referred to as 'Certificate'

(2) K-Roc is a registered trademark.

#### 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 a declared thermal conductivity ( $\lambda_D$ ) of  $0.034 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  (see section 6).

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

**Behaviour in relation to fire** — the product is classified as Class A1 in accordance with BS EN 13501-1 : 2007 (see section 8).

**Durability** — the product will have a life equivalent to that of the wall structure in which it is incorporated (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 First issue: 17 December 2020

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, the K-Roc Rainscreen Slab For Use In Rainscreen Cladding Systems, 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 is unrestricted by this Requirement. See section 8.1 of this Certificate.
<b>Requirement:</b>	<b>B4(1)</b>	<b>External fire spread</b>
Comment:		The product is unrestricted by this Requirement. See section 8.1 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, 7.2 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, but compensating fabric and/or services measures may need to be taken. 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 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>7(2)</b>	<b>Materials and workmanship</b>
Comment:		The product is unrestricted by this Regulation. See section 8.1 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 product can contribute to satisfying these Regulations, but compensating fabric and/or services measures may need to be taken. 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 product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	2.4	Cavities
Standard:	2.6	Spread to neighbouring buildings
Comment:		The product is unrestricted by these Standards, with reference to clauses 2.4.2 <sup>(1)(2)</sup> , 2.4.4 <sup>(1)</sup> , 2.4.6 <sup>(2)</sup> , 2.6.5 <sup>(1)</sup> , 2.6.6 <sup>(2)</sup> . See section 8.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> and 3.15.5 <sup>(1)(2)</sup> . See sections 7.1, 7.2 and 7.5 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Comment:		The product can contribute to satisfying this Standard, with reference to clauses, or parts of, 6.1.1 <sup>(1)</sup> , 6.1.2 <sup>(2)</sup> , 6.1.3 <sup>(1)</sup> , 6.1.4 <sup>(1)</sup> , 6.1.6 <sup>(1)(2)</sup> and 6.1.8 <sup>(2)</sup> , but compensating fabric and/or services measures may need to be taken. See sections 6.1 and 6.2 of this Certificate.

**Standard:** 6.2 **Building insulation envelope**  
**Comment:** The product can contribute to satisfying this Standard, with reference to clauses, or parts of, 6.2.1<sup>(1)(2)</sup>, 6.2.3<sup>(1)</sup>, 6.2.4<sup>(1)(2)</sup>, 6.2.5<sup>(2)</sup>, 6.2.6<sup>(1)(2)</sup>, 6.2.7<sup>(1)</sup>, 6.2.8<sup>(2)</sup>, 6.2.9<sup>(1)(2)</sup>, 6.2.10<sup>(1)</sup>, 6.2.11<sup>(1)(2)</sup>, 6.2.12<sup>(2)</sup> and 6.2.13<sup>(1)(2)</sup>, but compensating fabric and/or services measures may need to be taken. See sections 6.1 and 6.2 of this Certificate.

**Standard:** 7.1(a)(b) **Statement of sustainability**  
**Comment:** 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. In addition, the product 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.

**Regulation:** 12 **Building standards applicable to conversions**  
**Comment:** Comments in relation to the product 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)

**Regulation:** 23 **Fitness of materials and workmanship**  
**Comment:** The product is acceptable. See section 12 and the *Installation* part of this Certificate.

**Regulation:** 29 **Condensation**  
**Comment:** The product can contribute to satisfying this Regulation. See sections 7.1 and 7.2 of this Certificate.

**Regulation:** 35(4) **Internal fire spread – structure**  
**Comment:** The product is unrestricted by this Regulation. See section 8.1 of this Certificate.

**Regulation:** 36(a) **External fire spread – structure**  
**Comment:** The product is unrestricted by this Regulation. See section 8.1 of this Certificate.

**Regulation:** 39(a)(i) **Conservation measures**  
**Comment:** The product can contribute to satisfying this Regulation. See sections 6.1 and 6.2 of this Certificate.

**Regulation:** 40(2) **Target carbon dioxide emission rate**  
**Comment:** The product can contribute to satisfying this Regulation. 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 section: 3 *Delivery and site handling* (3.3) of this Certificate.

## Additional Information

### NHBC Standards 2020

In the opinion of the BBA, the K-Roc Rainscreen Slab For Use In Rainscreen Cladding Systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 6.1 *External masonry walls*, 6.2 *External timber framed walls*, 6.9 *Curtain walling and cladding* and 6.10 *Light steel framing*. Current NHBC guidance precludes the use of façade systems not utilising a drained cavity.

### CE marking

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

## Technical Specification

### 1 Description

1.1 The K-Roc Rainscreen Slab For Use In Rainscreen Cladding Systems comprises slabs of rigid stone mineral wool (MW). The slabs have the nominal characteristics shown in Table 1.

*Table 1 Nominal characteristics*

Length (mm)	1200
Width (mm)	600
Thickness (mm) <sup>(1)</sup>	30, 50, 60, 80, 90, 100, 110, 120, 130, 150, 160, 180, 200
Edge profile	Square

(1) Other slab thicknesses within the above range are available on request.

1.2 Ancillary items for use with the product, but outside the scope of this Certificate:

- rainscreen cladding panel and subframe
- insulation fasteners/fixings
- sheathing and lining board
- breather membranes
- vapour control layer (vcl).

### 2 Manufacture

2.1 Raw materials, mixed to a controlled formulation, are melted in a furnace to produce molten stone. Stone fibres are produced from the molten stone using a rotary spinning process. The fibres are treated with a resin and formed into a continuous length of insulation to the required thickness and density. The insulation then passes into an oven which cures the resin. Finally, the product is cut to the required dimensions to form the slabs.

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 systems of the manufacturer have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by RISE (Research Institutes of Sweden) (Certificate 1418-8 2018-03-30).

### 3 Delivery and site handling

3.1 Slabs are delivered to site in heat-shrink polythene film. Each pack carries a label bearing the Certificate holder's name, the product name and product description, and the BBA logo incorporating the number of this Certificate.

3.2 The slabs 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.

3.3 Dust masks, gloves and long-sleeved clothing should be worn when cutting and handling the slabs.

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

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the K-Roc Rainscreen Slab For Use In Rainscreen Cladding Systems.

## Design Considerations

### 4 Use

4.1 The K-Roc Rainscreen Slab For Use In Rainscreen Cladding Systems is effective in reducing the U value (thermal transmittance) of external walls of timber-frame, steel-frame or masonry buildings (where masonry includes clay and calcium silicate bricks, concrete blocks, and natural and reconstituted stone blocks), in new and existing domestic and non-domestic buildings. It is essential that such walls are designed and constructed to incorporate the normal precautions against moisture ingress, including the use of a breather membrane over the timber sheathing in framing board applications.

4.2 Certain rainscreen systems, such as those with open joints, may require the addition of a breather membrane incorporated into the system. The requirement for a membrane is determined by the system designer and is outside the scope of this Certificate.

4.3 Care must also be taken in the overall design and construction of elements incorporating the product to ensure appropriate:

- sheathing or bracing for frame elements. The product must not be relied on to provide any structural contribution, eg racking strength
- fire resistance, for elements and junctions
- continuity of insulation to minimise thermal bridging
- resistance to the ingress of precipitation and moisture from the ground.

4.4 The wall and sub-frame should be structurally sound, and should have been designed and constructed in accordance with the following Standards and, where appropriate, their UK National Annexes:

- BS 8000-3 : 2001
- BS EN 351-1 : 2007
- BS EN 845-1 : 2013
- BS EN 1993-1-2 : 2005 and its UK National Annex
- BS EN 1993-1-3 : 2006 and its UK National Annex
- BS EN 1995-1-1 : 2004 and its UK National Annex
- BS EN 1996-1-1 : 2005 and its UK National Annex
- BS EN 1996-1-2 : 2005 and its UK National Annex
- BS EN 1996-2 : 2006 and its UK National Annex
- BS EN 1996-3 : 2006 and its UK National Annex.

4.5 The designer should select a construction appropriate to the local wind-driven rain index to BS EN 1996-2 : 2006 and its UK National Annex, paying due regard to the design detailing, quality of work and materials to be used.

4.6 The air gap between the face of the insulation and the back of the rainscreen panels should be of sufficient width to allow any water passing the joints to run down the back of the rainscreen panels and be discharged externally without wetting the insulation or the backing wall. The minimum width for air gaps required by NHBC is:

- 50 mm for panels with open joints
- 38 mm for panels with baffled or labyrinth (rebated) joints.

4.7 The construction should be made weathertight as soon as is practically possible, to ensure maximum protection of the product.

## 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 the thermal transmittance (U value) should be carried out in accordance with, where relevant, BS EN ISO 6946 : 2017, BRE Report BR 443 : 2006, BRE Digest DG 465 and BS EN ISO 10211 : 2017, using the insulation's declared thermal conductivity ( $\lambda_D$ ) of  $0.034 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ .

6.2 The U value of a completed wall construction will depend on the insulation thickness, number and type of fixings, the rainscreen support systems, the insulating value of the substrate and its internal finish. Calculated U values for example constructions are given in Tables 2 to 4.

Table 2 Example U values — timber-frame rainscreen system<sup>(1)(2)</sup>

U value ( $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ )	K-Roc Rainscreen Slab thickness (clear 140 mm timber frame) (mm) <sup>(3)</sup>	K-Roc Rainscreen Slab thickness (fully filled 140 mm timber frame) (mm) <sup>(4)</sup>
0.18	— <sup>(5)</sup>	— <sup>(5)</sup>
0.19	— <sup>(5)</sup>	— <sup>(5)</sup>
0.25	— <sup>(5)</sup>	120
0.26	200	100
0.27	200	80
0.28	180	80
0.30	160	60
0.35	120	30

(1) Construction, external to internal:

10 mm rainscreen cladding, fully ventilated 50 mm clear cavity, K-Roc Rainscreen Slab, breather membrane, 9 mm OSB (oriented strand board) sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), 140 mm timber frame ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) (15% fraction), vcl and 15 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(2) A fixing correction factor ( $\Delta U_f$ ) of  $0.1 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  has been applied, to allow for the thermal bridging of the fixings and rainscreen brackets.

(3) Insulation installed against the sheathing board with no insulation in the timber frame.

(4) Insulation installed against the sheathing board with 140 mm of insulation in the timber frame ( $\lambda = 0.035 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) with a 15% timber frame fraction.

(5) Additional insulation required.

Table 3 Example U values — steel-frame rainscreen system<sup>(1)(2)</sup>

U value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	K-Roc Rainscreen Slab thickness (clear 90 mm steel frame) (mm) <sup>(3)</sup>	K-Roc Rainscreen Slab thickness (fully filled 90 mm steel frame) (mm) <sup>(4)</sup>
0.18	— <sup>(5)</sup>	— <sup>(5)</sup>
0.19	— <sup>(5)</sup>	— <sup>(5)</sup>
0.25	— <sup>(5)</sup>	160
0.26	200	150
0.27	200	130
0.28	180	120
0.30	150	100
0.35	120	80

(1) Construction, external to internal:

10 mm rainscreen cladding, fully ventilated 50 mm clear cavity, K-Roc Rainscreen Slab, breather membrane, 9 mm OSB sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), 90 mm light steel frame (0.2% fraction), vcl and 15 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(2) A fixing correction factor ( $\Delta U_f$ ) of  $0.1 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  has been applied, to allow for the thermal bridging of the fixings and rainscreen brackets.

(3) Insulation installed against the sheathing board with no insulation in the steel frame.

(4) Insulation installed against the sheathing board with 90 mm of insulation in the steel frame ( $\lambda = 0.038 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) with a 0.2% steel frame fraction.

(5) Additional insulation required.

Table 4 Example U values — masonry rainscreen system<sup>(1)(2)</sup>

U value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	K-Roc Rainscreen Slab (mm)
0.18	— <sup>(3)</sup>
0.19	— <sup>(3)</sup>
0.25	— <sup>(3)</sup>
0.26	200
0.27	180
0.28	180
0.30	150
0.35	120

(1) Construction, external to internal:

10 mm rainscreen cladding, fully ventilated 50 mm clear cavity, K-Roc Rainscreen Slab, 140 mm dense concrete block ( $\lambda = 1.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), 15 mm cavity (20% adhesive bridge) and 15 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(2) A fixing correction factor ( $\Delta U_f$ ) of  $0.1 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  has been applied, to allow for the thermal bridging of the fixings and rainscreen brackets.

(3) Additional insulation required.

## 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 Walls will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, Annexes D and G.

7.2 For the purpose of calculations, the water vapour diffusion resistance factor ( $\mu$ ) of the K-Roc Rainscreen Slab may be taken as 1.

7.3 A vapour control layer should be used in all constructions, should the condensation risk analysis show this is necessary.

## Surface condensation



7.4 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point, and the junctions with other elements are designed in accordance with the guidance referred to in section 6.3 of this Certificate.



7.5 In Scotland, walls will adequately limit the risk of surface condensation when 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 G. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.3 of this Certificate.

## 8 Behaviour in relation to fire



8.1 The product is classified as Class A1 in accordance with BS EN 13501-1 : 2007<sup>(1)</sup>. It is therefore 'non-combustible' as defined in the national Building Regulations and is not subject to any restriction on building height or proximity to boundaries.

(1) Exova Warrington fire, Report No 408721 (Issue 3), 19 March 2019. Copies can be obtained from the Certificate holder.

8.2 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 closers and barriers, fire stopping of service penetrations and combustibility limitations for other materials and components used in the overall wall construction.

## 9 Strength and stability

9.1 The wall and sub-frame to which the product is fixed, or which it is installed between, should be structurally sound and constructed in accordance with section 4.3 of this Certificate. However, when designing the wall for strength, stability and racking, no contribution from the insulation should be assumed.

9.2 Wind loads should be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. The higher pressure coefficients applicable to corners of buildings should be used.

9.3 The adequacy of fixing to the structural frame or substrate for specific installations is outside the scope of this Certificate and must be verified by a suitably experienced and qualified individual. Care is required around window and door openings to ensure that the structure is capable of sustaining the additional weight of reveal/frame details.

9.4 The cladding must be fixed to the frame or masonry substrate and designed by a suitably qualified and experienced individual in accordance with relevant Standards and Requirements (see section 4.4).

## 10 Water resistance

10.1 External walls should be in good condition and must resist the ingress of rain.

10.2 Care must be taken to ensure that the types of façades and wall finishes, and the design and detailing around openings, are appropriate for the anticipated exposure conditions and, if appropriate, resist the movement of the frame.

10.3 The product should be kept dry until the cladding is applied.

10.4 To resist the passage of moisture from the ground, adequate damp-proof courses and membranes must be provided in accordance with conventional good practice. The slabs must not be used in situations where they bridge the damp-proof course in walls.

10.5 Weather resistance is provided by an external cladding system (outside the scope of this Certificate).



## 11 Maintenance

As the product is confined between the wall and the cladding, and has suitable durability (see section 12), and provided the integrity of the cladding is maintained throughout the life of the system, maintenance is not required.

## 12 Durability



The product is unaffected by the normal conditions in a wall and is durable, rot proof, water resistant and sufficiently stable to remain effective as insulation for the life of the building.

## Installation

### 13 General

13.1 Installation of the K-Roc Rainscreen Slab For Use In Rainscreen Cladding Systems should be in accordance with this Certificate, the Certificate holder's instructions, and current good building practice.

13.2 The slab can be cut using a fine-toothed saw or sharp knife, but care must be taken to prevent damage, particularly to edges.

13.3 Cavity barriers should be provided as required by the documents supporting the national Building Regulations.

13.4 It is important to ensure a tight fit between slabs. Trimming must be accurate, to achieve close-butt joints and continuity of insulation.

13.5 The slabs are fixed against the external face of the sheathing board or against the external face of masonry substrates, in conjunction with masonry cladding or weathertight rainscreen cladding<sup>(1)</sup>, maintaining a cavity to ensure drainage.

(1) Rainscreen cladding systems are proprietary and utilise various mechanisms for attaching cladding panels to the wall structure. Site work guidance should be sought from the system manufacturer.

### 14 Procedure

14.1 Slabs should be close butted at all vertical and horizontal joints. The horizontal joints of the insulation should be staggered in accordance with good practice.

14.2 Fixings should have a minimum head diameter of 70 mm. A typical fixing pattern has three fixings per square metre, with one metal fixing at the centre of every slab (see section 9.3 of this Certificate).

14.3 The product should be cut and tightly fitted around wall brackets, where these occur.

14.4 For a typical installation, a breathable membrane is placed between the sheathing board and the product (see Figures 1 and 2). A vcl is placed between the plasterboard and the frame (see Figures 1 to 3). Designers should, however, choose a suitable construction on a case by case basis for a particular installation.

Figure 1 Timber-frame substrate

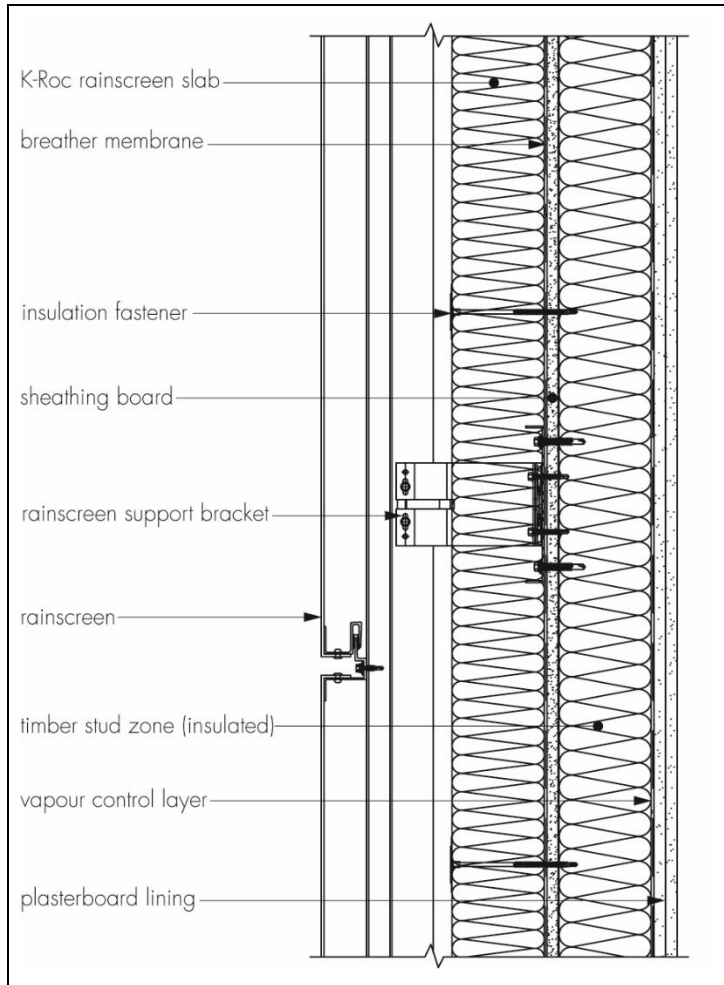


Figure 2 Lightweight steel-frame substrate

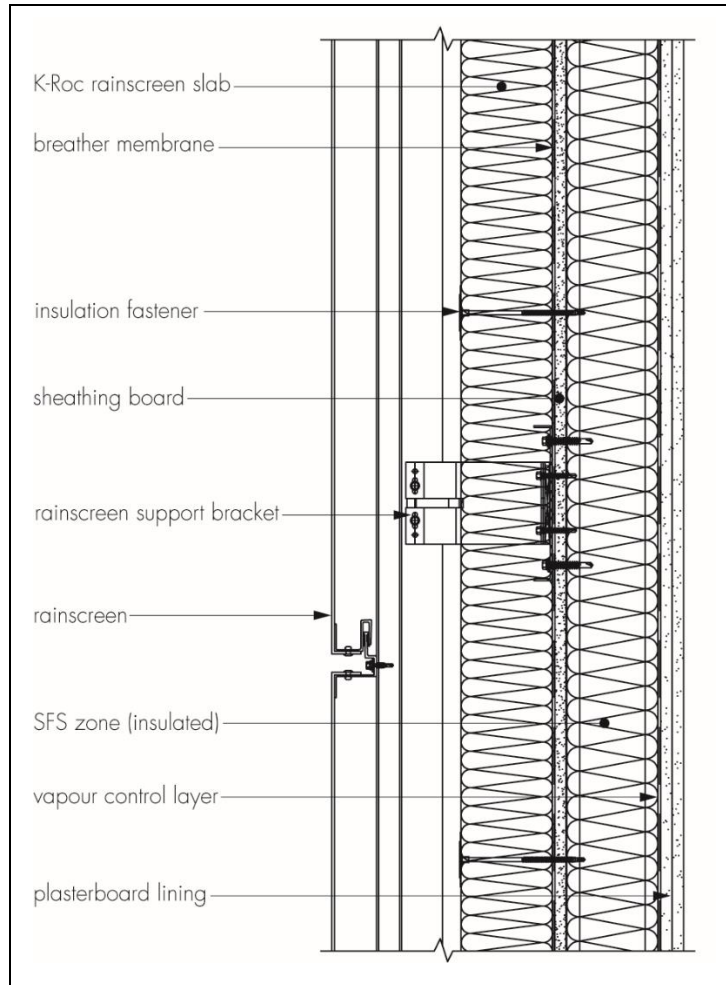
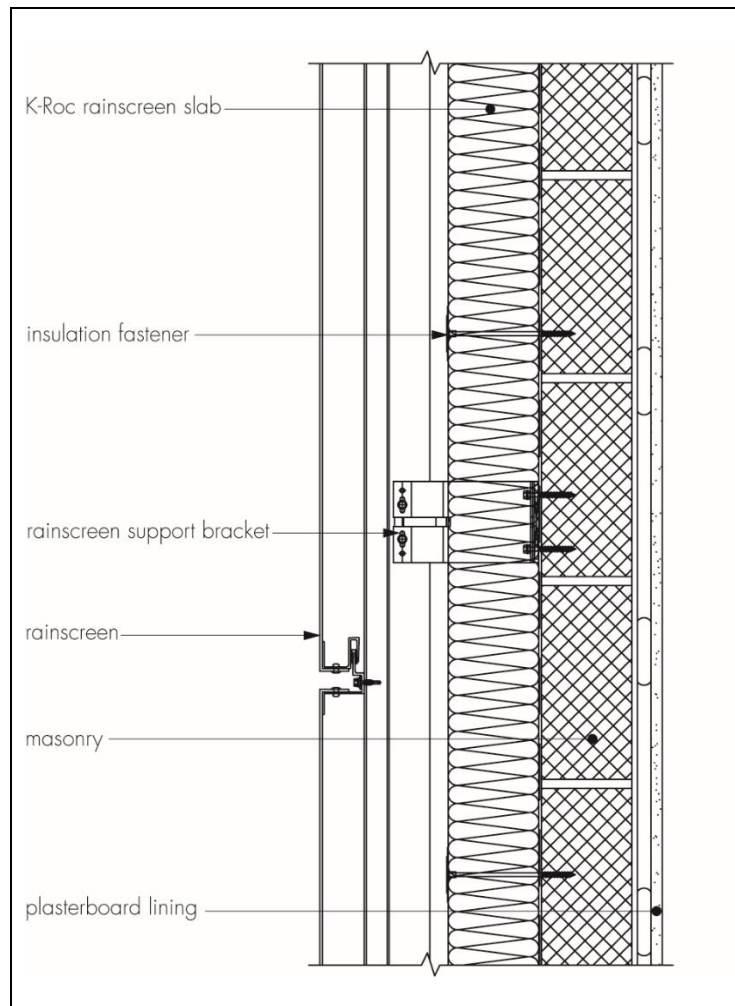


Figure 3 Masonry substrate



## Technical Investigations

### 15 Tests

Results of tests were assessed, to determine:

- thermal conductivity
- dimensional stability
- slab dimensions
- reaction to fire
- short-term water absorption.

### 16 Investigations

16.1 Existing data on durability and properties in relation to fire were evaluated.

16.2 A calculation was undertaken to confirm the declared thermal conductivity ( $\lambda_D$ ).

16.3 A series of U value calculations was carried out.

16.4 A condensation risk analysis was carried out.

16.5 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 465 : 2002 *U-values for light steel-frame construction*

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

BRE Report BR 443 : 2006 *Conventions for U-value calculations*

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

BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*

BS EN 351-1 : 2007 *Durability of wood and wood-based products — Preservative-treated solid wood — Classification of preservative penetration and retention*

BS EN 845-1 : 2013 + A1 : 2016 *Specification for ancillary components for masonry — Wall ties, tension straps, hangers and brackets*

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 1993-1-2 : 2005 *Eurocode 3 : Design of steel structures — General rules — Structural fire design*

NA to BS EN 1993-1-2 : 2005 *UK National Annex to Eurocode 3 : Design of steel structures — General rules — Structural fire design*

BS EN 1993-1-3 : 2006 *Eurocode 3: Design of steel structures — General rules — Supplementary rules for cold-formed members and sheeting*

NA to BS EN 1993-1-3 : 2006 *UK National Annex to Eurocode 3 — Design of steel structures — General rules — Supplementary rules for cold-formed members and sheeting*

BS EN 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5: Design of timber structures — General — Common rules and rules for buildings*

NA to BS EN 1995-1-1 : 2004 + A1 : 2008 *UK National Annex to Eurocode 5: Design of timber structures — General — Common rules and rules for buildings*

BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6: Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

NA to BS EN 1996-1-1 : 2005 + A1 : 2012 *UK National Annex to Eurocode 6 – Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

BS EN 1996-1-2 : 2005 *Eurocode 6: Design of masonry structures — General rules — Structural fire design*

NA to BS EN 1996-1-2 : 2005 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules — Structural fire design*

BS EN 1996-2 : 2006 *Eurocode 6: Design of masonry structures — Design considerations, selection of materials and execution of masonry*

NA to BS EN 1996-2 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

BS EN 1996-3 : 2006 *Eurocode 6: Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

NA + A1 : 2014 to BS EN 1996-3 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

BS EN 13162 : 2012 + A1 : 2015 *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification*

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

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

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

BS EN ISO 10211 : 2017 *Thermal bridges in building construction — Heat flows and surface temperatures — Detailed calculations*

### 17 Conditions

#### 17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.