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Agrément Certificate

19/5609

Product Sheet 1

KNAUF INSULATION

ROCKSILK RAINSCREEN SLAB FOR USE IN RAINSCREEN CLADDING SYSTEMS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Rocksilk⁽²⁾ 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 and reinforced concrete or masonry walls. The product is used in domestic or non-domestic buildings in conjunction with weathertight ventilated cladding systems.

(1) Hereinafter referred to as 'Certificate'.

(2) Rocksilk 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 value (λ_D) of $0.034 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ (see section 6).

Condensation — 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 Second issue: 11 June 2021

Originally certificated on 10 January 2019

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
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, Rocksilk 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)

Requirement:	B3(4)	Internal fire spread (structure)
Comment:		The product is unrestricted by this Requirement. See section 8.1 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The product is unrestricted by this Requirement. See section 8.1 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See sections 7.1, 7.2 and 7.4 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to satisfying this Requirement. See sections 6.1 and 6.2 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	7(2)	Materials and workmanship
Comment:		The product is unrestricted by this Regulation. See section 8.1 of this Certificate.
Regulation:	26	CO₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:		The product can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
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 ⁽¹⁾⁽²⁾ , 2.4.4 ⁽¹⁾ , 2.4.6 ⁽²⁾ , 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ . 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 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . 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 references to clauses, or parts of, 6.1.1 ⁽¹⁾ , 6.1.2 ⁽²⁾ , 6.1.3 ⁽¹⁾ , 6.1.4 ⁽¹⁾ , 6.1.6 ⁽¹⁾⁽²⁾ and 6.1.8 ⁽²⁾ . 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 references to clauses, or parts of, 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽¹⁾⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾⁽²⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾⁽²⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . 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 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 6.1 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		Comments made in relation to the product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .
		(1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



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

Regulation:	23	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> 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 section 6.1 and 6.2 of this Certificate.
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		The product is acceptable. 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 2021

In the opinion of the BBA, Rocksilk 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 framed walls and floors*. 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 Rocksilk RainScreen Slab for use in Rainscreen Cladding Systems comprises slabs of rigid rock mineral wool (MW) treated with a water-repellent additive. The slabs have the nominal characteristics shown in Table 1.

Table 1 Nominal characteristics

Length (mm)	1200
Width (mm)	600
Thickness (mm) ⁽¹⁾⁽²⁾	50, 75, 100, 120, 150, 180, 200, 210 and 250
Edge profile	Square

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

(2) Higher thicknesses can be achieved by double layering.

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 The slabs are manufactured from molten rock which is spun into rock mineral wool. A thermosetting binder is added, and the material is collected in the form of a blanket which is folded back (upon itself) to give the required product density. The blanket is then cured in a heated oven to form the required product, which is cut, trimmed and packaged.

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 Knauf Insulation Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by TÜV NORD Certification (Certificates 44 100 190742-021 and 44 104 190742-021 respectively).

3 Delivery and site handling

3.1 Slabs are delivered to site compression-wrapped in polythene. Each pack carries a label bearing the Certificate holder's name, 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 Rocksilk RainScreen Slab for use in Rainscreen Cladding Systems.

Design Considerations

4 Use

4.1 Rocksilk 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, reinforced concrete 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 their 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 both 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 1991-1-4 : 2005 and its UK National Annex
- BS EN 1992-1-1 : 2004 and its UK National Annex
- BS EN 1992-1-2 : 2004 and its UK National Annex
- 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, workmanship 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 BS EN ISO 6946 : 2017, BRE Report BR 443 : 2019, BRE Digest 465 and BS EN ISO 10211 : 2017 using the insulation's declared thermal conductivity value (λ_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 insulating value of the substrate and its internal finish. Calculated U values for example constructions are given in Tables 2, 3, 4 and 5.

Table 2 Example U values — timber frame rainscreen system⁽¹⁾⁽²⁾

U value ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)	Insulation thickness installed against the sheathing board – no insulation in the 140 mm timber frame (mm) ⁽³⁾	Insulation thickness installed against the sheathing board – fully filled with insulation in the 140 mm timber frame (mm) ⁽⁴⁾
0.18	390 ⁽⁵⁾	280 ⁽⁵⁾
0.19	350 ⁽⁵⁾	240 ⁽⁵⁾
0.25	200	120
0.26	200	100
0.27	180	100
0.28	180	75
0.30	150	50
0.35	120	50

(1) Construction, external to internal:

10 mm rainscreen cladding, open fully ventilated 50 mm clear cavity, Rocksilk RainScreen Slab, breather membrane, 9 mm timber 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 (ΔU_f) of $0.1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ has been applied, to allow for the thermal bridging of the rainscreen brackets.

(3) With a 15% timber frame fraction.

(4) Insulation ($\lambda = 0.035 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), with a 15% timber frame fraction.

(5) Achieved by double layering with the thicknesses specified in Table 1.

Table 3 Example U values — steel frame rainscreen system⁽¹⁾⁽²⁾

U value ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)	Insulation thickness installed against the sheathing board – no insulation in the 90 mm steel frame (mm) ⁽³⁾	Insulation thickness installed against the sheathing board – fully filled with insulation in the 90 mm steel frame (mm) ⁽⁴⁾
0.18	390 ⁽⁵⁾	350 ⁽⁵⁾
0.19	350 ⁽⁵⁾	300 ⁽⁵⁾
0.25	200	180
0.26	200	150
0.27	180	150
0.28	180	120
0.30	150	120
0.35	120	75

(1) Construction, external to internal:

10 mm rainscreen cladding, open fully ventilated 50 mm clear cavity, Rocksilk RainScreen Slab, breather membrane, 9 mm timber OSB (oriented strand board) sheathing board ($\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 90 mm light steel frame system (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 (ΔU_f) of $0.1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ has been applied, to allow for the thermal bridging of the rainscreen brackets.

(3) With a 0.2% steel frame fraction.

(4) Insulation ($\lambda = 0.038 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), with a 0.2% steel frame fraction.

(5) Achieved by double layering with the thicknesses specified in Table 1.

Table 4 Example U values — solid reinforced concrete rainscreen system⁽¹⁾⁽²⁾

U value (W·m ⁻² ·K ⁻¹)	Insulation thickness installed against the reinforced concrete panel (mm)
0.18	390 ⁽³⁾
0.19	350 ⁽³⁾
0.25	210
0.26	200
0.27	180
0.28	180
0.30	150
0.35	120

- (1) Construction, external to internal:
10 mm rainscreen cladding, open fully ventilated 50 mm clear cavity, Rocksilk RainScreen Slab, 150 mm reinforced concrete (1% steel), 15 mm dot and dab adhesive 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 (ΔU_f) of $0.1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ has been applied, to allow for the thermal bridging of the rainscreen brackets.
- (3) Achieved by double layering with the thicknesses specified in Table 1.

Table 5 Example U values — masonry rainscreen system⁽¹⁾⁽²⁾

U value (W·m ⁻² ·K ⁻¹)	Insulation thickness (mm)
0.18	390 ⁽³⁾
0.19	350 ⁽³⁾
0.25	210
0.26	200
0.27	180
0.28	180
0.30	150
0.35	120

- (1) Construction, external to internal:
10 mm rainscreen cladding, open fully ventilated 50 mm clear cavity, Rocksilk RainScreen Slab, 140 mm dense concrete block ($\lambda = 1.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 15 mm dot and dab adhesive 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 (ΔU_f) of $0.1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ has been applied, to allow for the thermal bridging of the rainscreen brackets.
- (3) Achieved by double layering with the thicknesses specified in Table 1.

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 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 The water vapour resistance factor (μ) of the insulation may be taken as 1.

7.3 A Vapour Control Layer (VCL) 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⁽¹⁾ as Class A1 in accordance with BS EN 13501-1 : 2007, and is not subject to any restriction on building height or proximity to boundaries.

(1) Exova Warringtonfire. Report No 355031, 28 July 2015. 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 Regulatory requirements (see section 4.4)

10 Water resistance

10.1 External walls must 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 before 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.

10.5 Weather resistance is provided by the 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 Rocksilk RainScreen Slab for use in Rainscreen Cladding Systems should be in accordance with the Certificate holder's instructions, current good building practice and this Certificate.

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

13.3 Cavity barriers should be provided at the junction of the external wall and roof space.

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⁽¹⁾, 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 manufacturers.

14 Procedure

14.1 The slab can be applied with either face in contact with the substrate.

14.2 Slabs should be in continuous and intimate contact with the substrate.

14.3 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.

14.4 Fixings should have a minimum head diameter of 70 mm. A typical fixing pattern has three fixings per square metre, with one metal fixing incorporating a metal head at the centre of every full or part slab (see section 9.4 of this Certificate).

14.5 Extra fixings will be required around openings and at corners.

14.6 The lower edge of the first run of slabs may be positioned below dpc level to provide some edge insulation for the floor.

14.7 The slab should be cut and tightly fitted around wall brackets where these occur. Slabs should be cut slightly (maximum 5 mm) oversize and can be compression-fitted into place.

14.8 For a typical installation, a breathable membrane is placed between the sheathing board and the slab. A VCL is placed between the plasterboard and the frame (see Figures 1 and 2).

Figure 1 Timber frame substrate

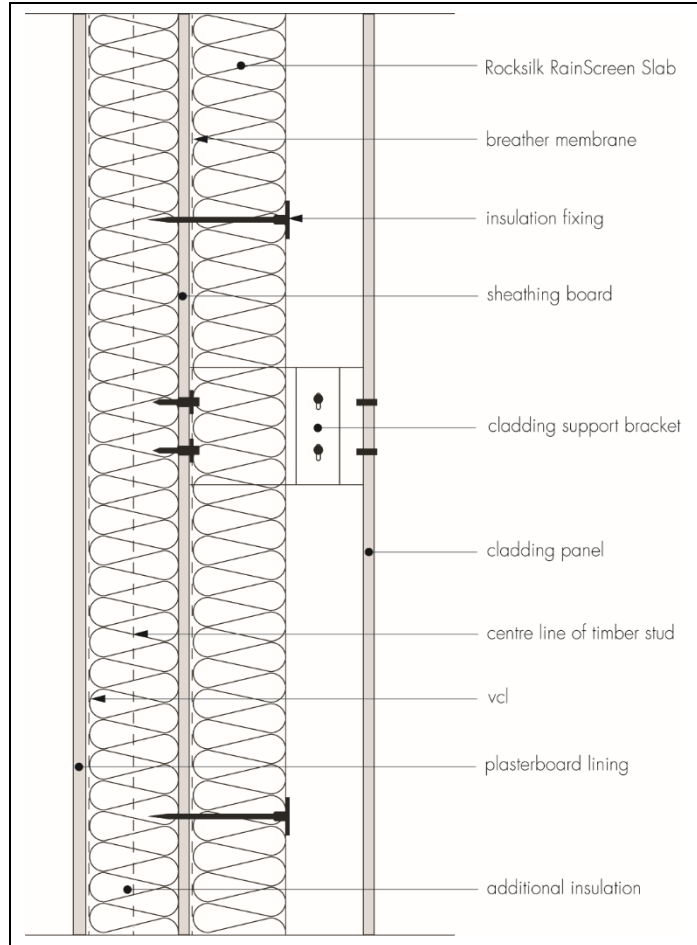


Figure 2 Lightweight steel frame substrate

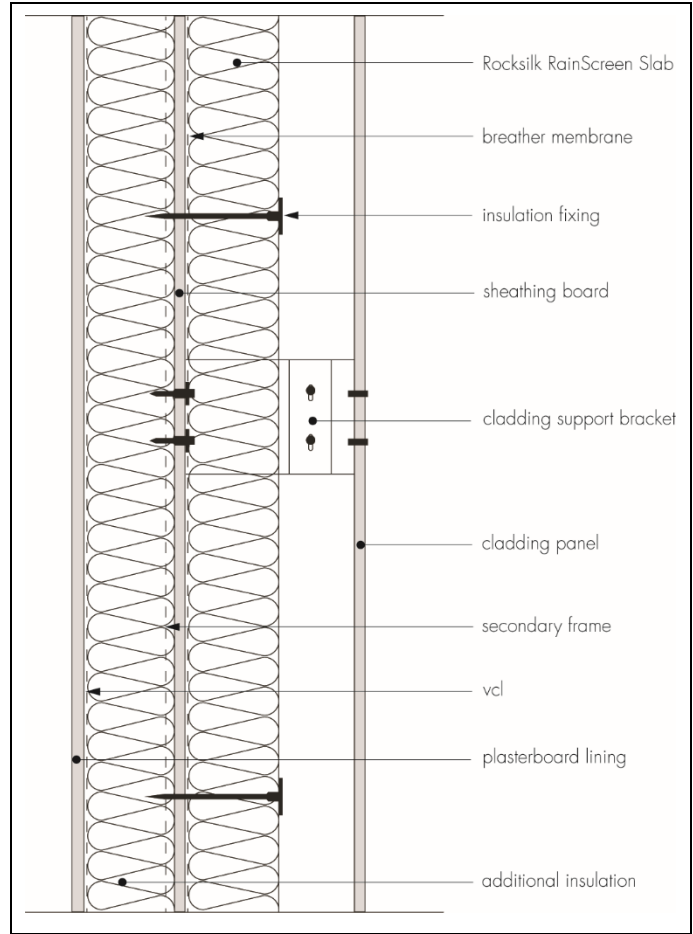


Figure 3 Masonry substrate

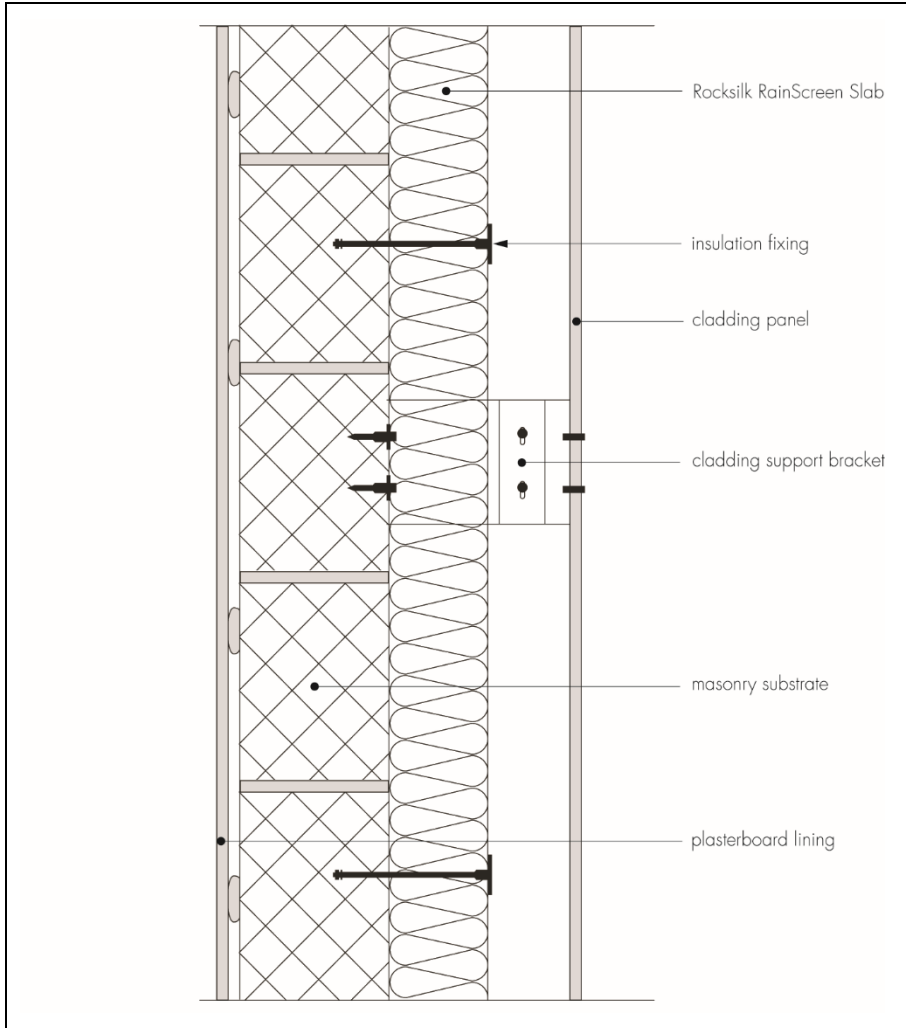
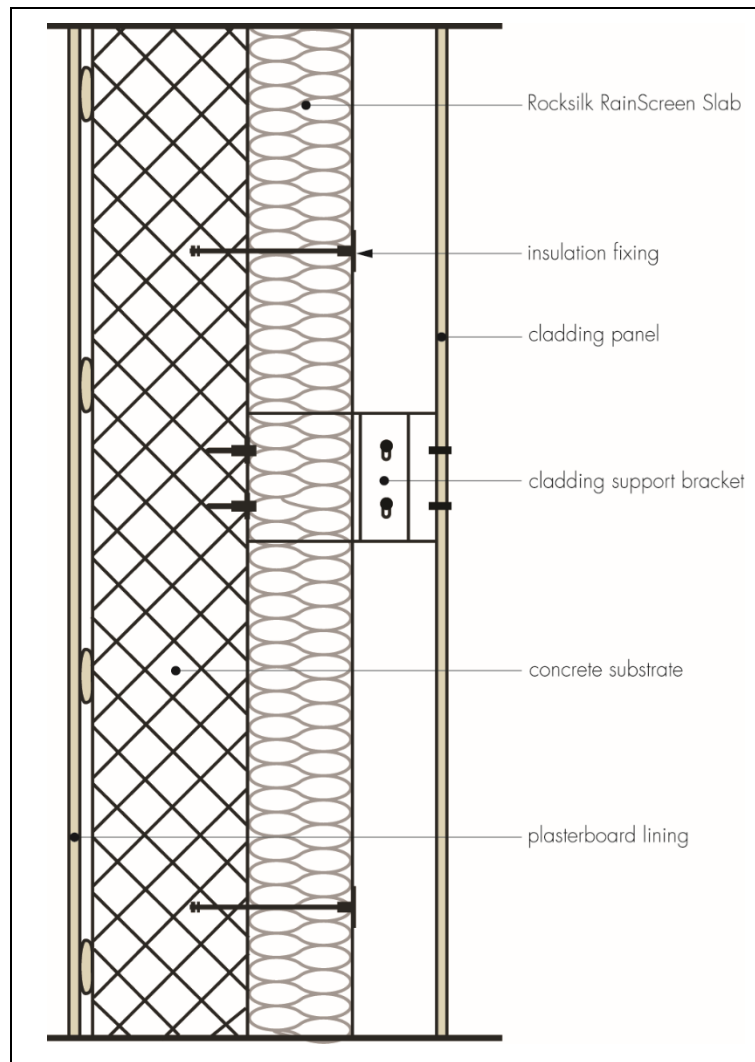


Figure 4 Reinforced concrete substrate



Double layering

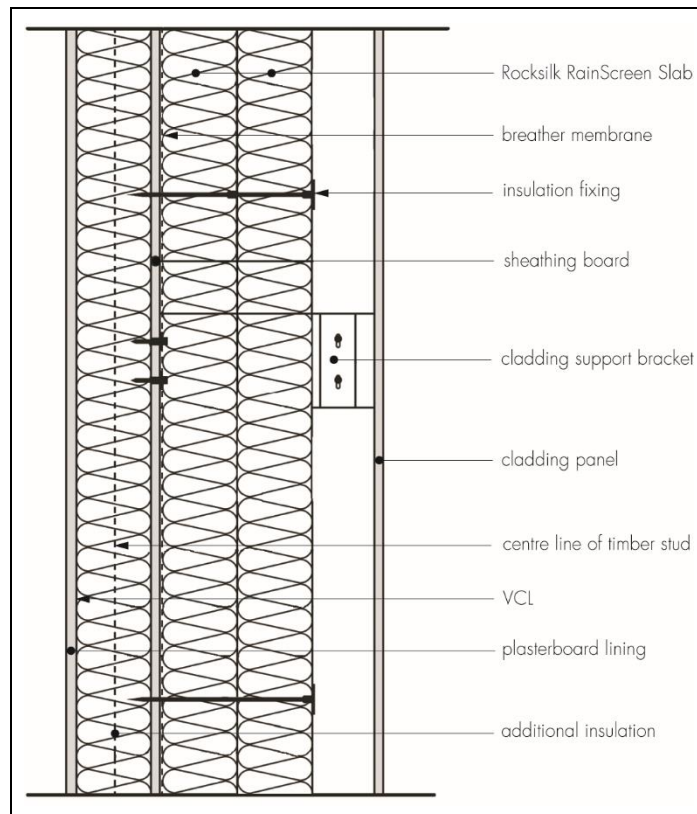
14.9 For steel frame systems or timber frames, the first row of slabs should be installed in portrait orientation. These should be fixed through the centre of the slabs into the sheathing board and a stainless steel washer used. The second layer can either be fixed in portrait (staggered by 300 mm) or landscape orientation, and again fixed in position through the centre of the slab to the stud utilising a stainless steel washer. Additional fixings utilising either stainless steel or plastic washers can be installed at the slab joints into the studs.

14.10 For a masonry substrate, either of the above methods can be used or both layers may be installed in a horizontal orientation (staggered by 600 mm), ensuring that at least one fixing with a stainless steel washer is installed into the centre of each slab back to the masonry substrate, and making sure this fixing does not interfere with the final fixing pattern of the product.

14.11 Slabs should be cut slightly (maximum 5 mm) oversize and can be compression-fitted into place, ensuring a tight fit between slabs and wall brackets where these occur.

14.12 The Certificate holder's guidance should be sought on detailed installation methods for specific projects.

Figure 5 Double layer timber frame



Technical Investigations

15 Tests

Results of tests were assessed, to determine:

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

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 value (λ_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 Report BR 262 : 2002 *Thermal insulation: avoiding risks*
- BRE Report BR 443 : 2019 *Conventions for U-value calculations*
- BRE Digest 465 : 2002 *U-Values for light steel-frame construction*
- BS EN 845-1 : 2013 + A1 : 2016 *Specification for ancillary components for masonry — Wall ties, tension straps, hangers and brackets*
- 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 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 1992-1-1 : 2004 + A1 : 2014 *Eurocode 2: Design of concrete structures — General rules and rules for buildings*
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- BS EN 1992-1-2 : 2004 + A1 : 2019 *Eurocode 2: Design of concrete structures — General rules — Structural fire design*
NA to BS EN 1992-1-2 : 2004 UK National Annex to *Eurocode 2: Design of concrete structures — General rules — Structural fire design*
- 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*
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- BS EN 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5: Design of timber structures — General — Common rules and rules for buildings*
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- BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6: Design of masonry structures — General rules for reinforced and unreinforced masonry structures*
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BS EN 13162 : 2012 + A1 : 2015 *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification*

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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 14001 : 2015 *Environmental management systems — Requirements with guidance for use*

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

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