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Agrément Certificate
14/5091
Product Sheet 3

FASSATHERM EXTERNAL WALL INSULATION SYSTEMS

FASSATHERM MECHANICALLY FIXED MW EXTERNAL WALL INSULATION SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Fassatherm Mechanically Fixed MW External Wall Insulation System comprising mineral wool insulation slabs, mechanically-fixed with supplementary adhesive, with a reinforced basecoat and render finishes. It is suitable for use on the outside of external walls in new and existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Thermal performance — the system can be used to improve the thermal performance of external walls and can contribute to meeting the requirements of the national Building Regulations (see section 6).

Strength and stability — the system can adequately resist wind loads and has sufficient resistance to impact-damage (see section 7).

Behaviour in relation to fire — The system has an A2-s1, d0 reaction to fire classification in accordance with BS EN 13501-1 : 2007 (see section 8).

Risk of condensation — the system can contribute to limiting the risk of interstitial and surface condensation (see section 11).

Durability — when installed and maintained in accordance with the Certificate holder's recommendations and the terms of the Certificate, the system will remain effective for at least 30 years (see section 13).



The BBA has awarded this Certificate to the company named above for the system described herein. This system 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

Brian Chamberlain
Head of Approvals — Engineering

Claire Curtis-Thomas
Chief Executive

Date of Second issue: 20 January 2015

Originally certificated on 16 April 2014

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 are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, the Fassatherm Mechanically Fixed MW External Wall Insulation System, if installed, used and maintained in accordance with this Certificate, will 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: A1	Loading
Comment:	The system can sustain and transmit wind loads to the substrate wall. See section 7.4 of this Certificate.
Requirement: B4(1)	External fire spread
Comment:	The system can satisfy this Requirement. See sections 8.1 to 8.4 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	The system can provide a degree of protection against rain ingress. See sections 4.3 and 10.1 of this Certificate.
Requirement: C2(c)	Resistance to moisture
Comment:	The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.1, 11.2 and 11.4 of this Certificate.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	The system can contribute to satisfying this Requirement. See sections 6.2 and 6.3 of this Certificate.
Regulation: 7	Materials and workmanship
Comment:	The system is acceptable. See section 13.1 and the <i>Installation</i> part 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 system can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: 8(1)(2)	Durability, workmanship and fitness of materials
Comment:	The system can contribute to a construction satisfying this Regulation. See sections 12 and 13.1 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards applicable to construction
Standard: 1.1	Structure
Comment:	The system can sustain and transmit wind loads to the substrate wall. See section 7.4 of this Certificate.
Standard: 2.6	Spread to neighbouring buildings
Comment:	The system can satisfy this Standard, with reference to clauses 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ . See sections 8.1 to 8.4 of this Certificate.
Standard: 2.7	Spread on external walls
Comment:	The system can satisfy this Standard, with reference to clauses 2.7.1 ⁽¹⁾⁽²⁾ and 2.7.2 ⁽²⁾ . See sections 8.1 to 8.4 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The system will contribute to a construction satisfying this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.2 ⁽¹⁾⁽²⁾ . See sections 4.3 and 10.1 of this Certificate.
Standard: 3.15	Condensation
Comment:	The system 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 11.3 and 11.4 of this Certificate.
Standard: 6.1(b)	Carbon dioxide emissions
Standard: 6.2	Building insulation envelope
Comment:	The system can contribute to satisfying these Standards, with reference to clauses (or parts of) 6.1.1 ⁽¹⁾ , 6.1.2 ⁽¹⁾⁽²⁾ , 6.1.3 ⁽¹⁾⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.1.10 ⁽²⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See sections 6.2 and 6.3 of this Certificate.
Standard: 7.1(a)(b)	Statement of sustainability
Comment:	The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting the bronze level of sustainability as defined in this Standard. In addition, the system 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⁾ [Aspect 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 6.2 of this Certificate.
Regulation: 12	Building standards applicable to conversions
Comment:	All comments given for the system 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

Regulation:	23	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		Walls insulated with the system will satisfy this Regulation. See sections 4.3 and 10.1 of this Certificate.
Regulation:	29	Condensation
Comment:		Walls insulated with the system will satisfy the requirements of this Regulation. See section 11.4 of this Certificate.
Regulation:	30	Stability
Comment:		The system can sustain and transmit wind loads to the substrate wall. See section 7.4 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The system can satisfy this Regulation. See sections 8.1 to 8.4 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40	Target carbon dioxide emission rate
Comment:		The system can contribute to satisfying these Regulations. See sections 6.2 and 6.3 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.2 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of the Fassatherm Mechanically Fixed MW External Wall Insulation System, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Part 6 Superstructure, Chapter 6.9 Curtain Walling and Cladding*.

Technical Specification

1 Description

1.1 Fassatherm Mechanically Fixed MW External Wall Insulation System consists of insulation slabs which are attached to the substrate with approved fixings and supplementary adhesive. The selected primary mechanical fixing should be applied at a rate of 4.16 fixings per m². The insulation slabs are protected by a basecoat containing glassfibre reinforcement mesh. After allowing the basecoat to dry, a primer and a topcoat are applied to the required thickness.

1.2 The system is made up of the following components:

Adhesives (supplementary)

A range of cement-based adhesives, supplied as powder to which water is added and applied and should cover at least 50% of the bonded area of the insulation slab. The range comprises:

- Fassatherm A96 adhesive, requiring the addition of approximately 6.5 litres of clean water per 25 kg of adhesive
- Fassatherm AL88 adhesive, requiring the addition of approximately 8 litres of clean water per 25 kg of adhesive.

Insulation

- Mineral wool slab — 1200 mm by 600 mm in a range of thicknesses between 50 mm and 200 mm in increments of 10 mm, with a maximum density of 105 kg·m⁻³ and a minimum tensile strength perpendicular to the face of 10 kN·m⁻². Slabs are manufactured to comply with BS EN 13162 : 2012
- Rockwool Dual Density slab — 1200 mm by 600 mm in a range of thicknesses between 50 mm and 200 mm, with an average density of 110 kg·m⁻³ and a minimum tensile strength perpendicular to the faces of 10 kN·m⁻². Slabs are manufactured to comply with BS EN 13162 : 2012.

Mechanical fixings

Mechanical fixings — anchors with adequate length to suit the substrate and insulation thickness and selected from:

- EJOT H1-ECO (Combi Fix) — polyethylene, PE-HD with an electro-galvanized pins and a polyamide, PA GF 50 mounting plug
- EJOT STR U (Top Fix) — polyethylene, PE-HD with stainless steel or electro-galvanized screws
- EJOT NTK U (Telefix) — polyethylene, PE-HD with a polyamide, PA GF 50 centre pin.

Basecoat

- Fassatherm A96 basecoat, a cement-based powder requiring the addition of approximately 6.5 litres of clean water per 25 kg of basecoat. The basecoat is applied to a thickness of between 4 mm and 6 mm and is for use with any render finish
- Fassatherm AL88 basecoat, cement-based powder requiring the addition of approximately 8 litres of clean water per 25 kg of basecoat. The basecoat is applied to a thickness of between 5 mm and 6 mm and is for use with any render finish.

Reinforcement

Fassanet 160 — 1.0 m wide alkali-resistant glassfibre mesh with a nominal weight of 155 g·m⁻² and mesh size of 3.8 mm by 4.1 mm.

Primers

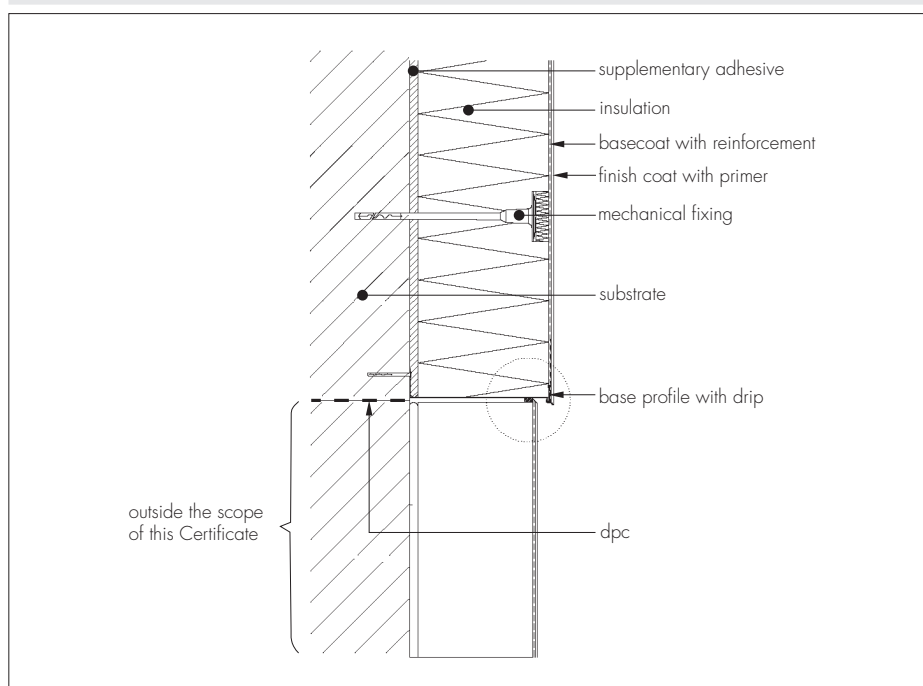
- Fassatherm FA 249 — liquid acrylic primer to which water is added, for use with Fassatherm RTA 549 render
- Fassatherm FS 412 — liquid silicone primer to which water is added, for use with Fassatherm RSR 421 render
- Fassatherm F328 — liquid silicate primer to which water is added, for use with Fassatherm R336 render
- Fassatherm FX 526 — liquid acrylic/siloxane primer to which water is added, for use with Fassatherm RX 561 render.

Render finishes

- Fassatherm RTA 549 — an acrylic render available in a range of colours, with 1.0 mm, 1.5 mm, 2.0 mm and 3.0 mm grain sizes⁽¹⁾
- Fassatherm RSR 421 — a silicone render available in a range of colours, with 0.6 mm, 1.0 mm, 1.5 mm, 2.0 mm and 3.0 mm grain sizes⁽¹⁾
- Fassatherm R336 — a silicate render available in a range of colours, with 0.6 mm, 1.0 mm, 1.5 mm, 2.0 mm and 3.0 mm grain sizes⁽¹⁾
- Fassatherm RX 561 — an acrylic/siloxane render available in a range of colours, with 1.0 mm, 1.5 mm and 2.0 mm grain sizes⁽¹⁾.

(1) Thickness is regulated by the grain size.

Figure 1 Fassatherm Mechanically Fixed MW External Wall Insulation System



1.3 Ancillary materials also used with the system but outside the scope of this Certificate are:

- profiles — a range of standard profiles (beading) for wall base, end stop, corner mesh, expansion joints. Profiles are available in aluminium or PVC
- profile fixings — driven pins with plastic expansion sleeves, as approved by the Certificate holder
- alga and fungi wash
- silicone sealant
- expanding tape — polyurethane soft foam tape for sealing around window sills
- waterproofing profile — PVC profile with an integral polyurethane tape, used to waterproof around windows and doors

- rigid supports for fixing elements outside the insulation. Supports are available in polypropylene, EPS or polyurethane
- extruded polystyrene insulation boards.

2 Manufacture

2.1 Components are manufactured by the Certificate holder or bought in from suppliers, to an agreed specification.

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 Fassa S.r.l. has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by IQNet (Certificate IT-67055).

3 Delivery and site handling

3.1 The insulation slabs are delivered in sealed packs, with the product identification and manufacturer's batch numbers.

3.2 The other components are delivered in the quantities and packaging listed in Table 1. Each package carries the product identification and manufacturer's batch number.

Component	Quantity and packaging
Fassatherm supplementary adhesives and Fassatherm basecoats	25 kg bag
Mechanical fixings	boxed by manufacturer
Reinforcement mesh	1 m wide rolls x 50 m length
Fassatherm primers	5 litre or 16 litre tubs
Fassatherm renders	25 kg tubs

3.3 The insulation slabs should be stored on a firm, clean, level base, off the ground and under cover until required for use. Care must be taken when handling the insulation to avoid damage.

3.4 The slabs should be protected from prolonged exposure to sunlight, either by storing opened packs under cover or re-covering with opaque polythene sheeting.

3.5 Care must be taken when handling the slabs to avoid contact with solvents or materials containing volatile organic components.

3.6 The powder adhesive and render must be stored in dry conditions, off the ground, and protected from moisture. Contaminated materials should be discarded.

3.7 The primers and renders must be stored in tightly-closed original packaging in cool dry conditions and protected from excessive heat and frost at times.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Fassatherm Mechanically Fixed MW External Wall Insulation System.

Design Considerations

4 General

4.1 Fassatherm Mechanically Fixed MW External Wall Insulation System, when installed in accordance with this Certificate, is effective in reducing the thermal transmittance (U value) of external masonry walls of new and existing buildings. It is essential that the detailing techniques specified in this Certificate are carried out to a high standard if the ingress of water into the insulation is to be avoided and the full thermal benefit obtained from treatment with the system. Only details specified by the Certificate holder should be used.

4.2 The system is for application to the outside of external walls of masonry, or dense or no-fines concrete construction, on new or existing domestic and non-domestic buildings (with or without existing render). Prior to installation of the system, wall surfaces should comply with section 14 of this Certificate.



4.3 New buildings subject to national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS EN 1996-2 : 2006, in that the designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used
- BS 8000-3 : 2001.

4.4 Other new buildings, not subject to regulatory requirements should also be built in accordance with the Standards identified in section 4.3.

4.5 The system will improve the weather resistance of a wall and provide a decorative finish. However, it should only be installed where there are no signs of dampness on the inner surface of the wall other than those caused solely by condensation.

4.6 The effect of the installation of the insulation system on the acoustic performance of a construction is outside the scope of this Certificate.

4.7 The fixing of rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items is outside the scope of this Certificate.

4.8 External plumbing should be removed before installation and alterations made to underground drainage, where appropriate, to accommodate repositioning of the plumbing to the finished face of the system.

4.9 It is essential that this system is installed and maintained in accordance with the conditions set out in this Certificate.

5 Practicability of installation

The system should only be installed by specialised contractors who have successfully undergone training and registration by the Certificate holder (see section 14).

Note: The BBA operates a UKAS Accredited Approved Installer Scheme for external wall insulation; details of approved installer companies are included on the BBA's website (www.bbacerts.co.uk).

6 Thermal performance

6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006, using the declared thermal conductivity value (λ_D) of $0.036 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.



6.2 The U value of a completed wall will depend on the insulation thickness, the type and number of fixings, and the insulating value of the substrate masonry and its internal finish. Figures for typical design U values, calculated in accordance with section 6.1, are given in Table 2 of this Certificate.

Table 2 Insulation thickness required to achieve design U values⁽¹⁾⁽²⁾⁽³⁾ given in the national Building Regulations

U value ⁽⁴⁾ ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)	Thickness of Insulation (mm)	
	215 mm brickwork, $\lambda = 0.56 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	200 mm dense blockwork, $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$
0.18	190	200
0.19	180	180
0.25	130	140
0.26	120	130
0.28	110	120
0.30	100	110
0.35	90	90

(1) Wall construction inclusive of 13 mm plaster ($\lambda = 0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar ($\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$). Declared thermal conductivity of insulation values (λ_D) is as shown in section 6.1. An adhesive layer, 5 mm thick with $\lambda = 0.43 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ covering 50% of the area is also included, and a slab emissivity of 0.9, together with an external render thickness of 5 mm with $\lambda = 1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

(2) Calculations based on a bonded system that included 4.16 polyethylene fixings per square metre with a point thermal transmittance ($X_p = 0.002 \text{ W}\cdot\text{K}^{-1}$) per steel pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2007. A gap correction (ΔU^*) of zero is assumed.

(3) Based upon an incremental insulation thickness of 10 mm.

(4) When applying the maximum available insulation thickness, these walls can achieve U values from 0.17 to 0.18 $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ depending on the wall type.

6.3 The system can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between external walls and other elements. Details shown in section 16 will allow use of the default ψ -values (Psi) for Accredited Construction Details in Emission Rate calculations to SAP 2009 or the Simplified Building Energy Model (SBEM). Detailed guidance can be found in the documents supporting the national Building Regulations.

7 Strength and stability

General

7.1 When installed on suitable walls, the system can adequately transfer to the wall the self-weight and negative (suction) and positive (pressure) wind loads normally experienced in the United Kingdom.

7.2 Positive wind load is transferred to the substrate wall directly via bearing and compression of the render and insulation.

7.3 Negative wind pressure is resisted by the bond between each component. The insulation slabs are retained by the external wall insulation system anchors.

7.4 The wind loads on the walls should be calculated in accordance with BS EN 1991-1-4 : 2005. Special consideration should be given to locations with high wind-load pressure coefficients, as additional fixings may be necessary. In accordance with BS EN 1990 : 2002, it is recommended that a load factor of 1.5 is used to determine the ultimate wind load to be resisted by the system.

7.5 Assessment of structural performance for individual installations should be carried out by a suitably qualified and experienced individual to confirm that:

- the substrate wall has adequate strength to resist the additional loads that may be applied as a result of installing the system, ignoring any positive contribution that may occur from the system
- the proposed system and associated fixing layout provides adequate resistance to negative wind loads, based on the results of site investigation and test results
- an appropriate number of site-specific pull-out tests are conducted on the substrate of the building to determine the minimum resistance to failure of the fixings. The characteristic pull-out resistance should be determined in accordance with the guidance given in ETAG 014 : 2011, Annex D.

7.6 The number and centres of fixings should be determined by the system designer. Provided the substrate wall is suitable and an appropriate fixing is selected, the mechanical fixings will adequately support and transfer the weight of the render insulation system to the substrate wall at the minimum spacing's given in this Certificate.

7.7 Typical characteristic pull-out strengths for the fixings taken from the corresponding European Technical Approval (ETA) are given in Table 3; however, these values are dependent on the substrate, and the fixing must be selected to suit the loads and substrate concerned.

Table 3 Fixings – typical characteristic pull-out strengths

Fixing Type	ETA No.	Substrate	Drill diameter (mm)	Effective anchorage depth (mm)	Typical pull-out strength (kN) ⁽¹⁾
EJOT H1-ECO (Combil Fix)	11/0192	Concrete C12/15/ clay brickwork	8	25	0.9/0.9
EJOT NTK-U (Telefix)	07/0026	Concrete C12/15/ clay brickwork	8	40	0.6/0.9
EJOT STR-U (Top Fix)	04/0023	Concrete C12/15/ clay brickwork	8	25 ⁽²⁾	1.5/1.5

(1) Values are determined in accordance with ETAG 014 : 2011 and are dependent on the substrate.

(2) 65 mm for autoclaved aerated concrete.

7.8 The resistance forces data given in Table 4 are the results of calculations based upon pull-through resistances determined by the BBA from tests on anchors with 60 mm diameter plate.

Table 4 fixing pull-through resistance

Factor (unit)	Mineral wool slab	Mineral wool slab	Rockwool Dual Density slab
Insulation thickness (mm)	≥50 ⁽⁴⁾	≥100 ⁽³⁾	≥50 ⁽⁵⁾
Tensile resistance of insulation (kPa)	≥10	≥10	≥10
Fixing plate stiffness value (kN·mm)	0.5	0.6	0.5 or 0.6
Pull-through resistance ⁽¹⁾ (per anchor) (N)	150	247	150
Factor of safety ⁽²⁾	2.5	2.5	2.5
Design pull-through resistance (N)	60	99	60

(1) Pull-over resistance of insulation over the head of the fixing.

(2) The safety factor of 2.5 is based on the assumption that all insulation slabs are quality control tested to establish tensile strength perpendicular to the face of the slab.

(3) The minimum residual thickness of the insulation product, excluding the depth of the fixing die, must be ≥100 mm when embedding the EJOT STR U fixing in the insulation.

(4) The minimum residual thickness of the insulation product, excluding the depth of the fixing die, must be ≥50 mm when embedding the EJOT STR U fixing in the insulation.

(5) EJOT STR U fixing must not be embedded into the Rockwool Dual Density slab.

Impact resistance

7.9 Hard body impact tests were carried out in accordance with ETAG 004 : 2000 (amended 2013). The system is suitable for the Use Categories listed in Table 5 of this Certificate.

Table 5 Fassatherm Mechanically Fixed MW External Wall Insulation System impact resistance

Basecoat	Render	Use Category ⁽¹⁾	
		Single layer of mesh	Double layer of mesh
Fassatherm A96	Fassatherm RTA 549, Fassatherm RSR 421, Fassatherm R 336 and Fassatherm RX 561	II	II
Fassatherm AL88	Fassatherm RTA 549, Fassatherm R 336 and Fassatherm RX 561	II	II
Fassatherm AL88	Fassatherm RSR 421	III	II

(1) These categories are defined in ETAG 004 : 2000 (amended 2013) as:

- Category I – a zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use
- Category II – a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care
- Category III – a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

8 Behaviour in relation to fire



8.1 The reaction to fire classification for the system is A2-s1, d0 in accordance with BS EN 13501-1 : 2007.

8.2 The classification applies to the full range of thicknesses and finishes covered by the Certificate.

8.3 The mineral wool insulation material is classified as non-combustible.

8.4 The system is considered suitable for use on or at any distance from the boundary and there is no restriction on the height for use in buildings.

8.5 For application to second storey walls and above, it is recommended that the designer considers at least one stainless steel fixing per square metre, as advised in BRE Report BR 135 : 2013.

9 Proximity of flues and appliances

When the system is installed in close proximity to certain flue pipes, the relevant provisions of the national Building Regulations should be met:

England and Wales – Approved Document J

Scotland – Mandatory Standard 3.19, clause 3.19.4⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland – Technical Booklet L.

10 Water resistance




10.1 The system will provide a degree of protection against water ingress. However, care should be taken to ensure that walls are adequately watertight prior to application of the system. The system must only be installed where there is no sign of dampness on the inner surface of the substrate other than that caused solely by condensation.

10.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of water ingress.


10.3 The guidance given in BRE Report BR 262 : 2002 should be followed in connection with the watertightness of solid wall constructions. The designer should select a construction appropriate to the local wind-driven index, paying due regard to the design detailing, workmanship and materials to be used.


10.4 At the top of walls, the system should be protected by an adequate overhang or other detail designed for use with this type of system (see section 16).

11 Risk of condensation


 11.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of the construction, including openings and penetrations at junctions between the insulation system and windows, to minimise the risk of condensation. The recommendations of BS 5250 : 2011 should be followed.

Surface condensation

 11.2 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 and openings comply with section 6.3 of this Certificate.

 11.3 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. Guidance may be obtained from BS 5250 : 2011, section 4 and Annex G, and BRE Report BR 262 : 2002.

Interstitial condensation

 11.4 Walls incorporating the system will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, section 4 and Annexes D and G.

11.5 The water vapour resistance (μ) factor (for the insulation slabs) and equivalent air layer thickness ($s_{e,i}$) (for the render system) is shown in Table 6 of this Certificate.


Table 6 Water vapour resistance factor and equivalent air layer thickness

	$s_{e,i}$ (m)	(μ)
Mineral wool insulation thickness 50 mm to 200 mm	—	1
Rendering system : Fassatherm A96 basecoat ⁽²⁾ + primer + finish coat (specific particle size), as indicated below		
Fassatherm FA 249 + Fassatherm RTA 549 (particle size 2.0 mm)	0.3	—
Fassatherm FS 412 + Fassatherm RSR 421 (particle size 2.0 mm)	0.5	—
Fassatherm F 238 + Fassatherm R 336 (particle size 2.0 mm)	0.3	—
Fassatherm FX 526 + Fassatherm RX 561 (particle size 1.0 mm)	0.510	—
Rendering system : Fassatherm AL88 basecoat ⁽²⁾ + primer + finish coat (specific particle size), as indicated below		
Fassatherm FA 249 + Fassatherm RTA 549 (particle size 2.0 mm)	0.4	—
Fassatherm FS 412 + Fassatherm RSR 421 (particle size 2.0 mm)	0.3	—
Fassatherm F 238 + Fassatherm R 336 (particle size 2.0 mm)	0.2	—
Fassatherm FX 526 + Fassatherm RX 561 (particle size 1.0 mm)	0.510	—

(1) Applied to a thickness of approximately 4 mm.

(2) Applied to a thickness of approximately 5 mm.


12 Maintenance and repair

 12.1 Regular checks should be made on the installed system, including:

- visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired
- examination of the sealant around openings and service entry points
- visual inspection of architectural details designed to shed water to confirm that they are performing properly
- visual inspection to ensure that water is not leaking from external downpipes or gutters; such leakage could penetrate the rendering
- necessary repairs effected immediately and the sealant joints at window and door frames replaced at regular intervals
- maintenance schedules, which should include the replacement and resealing of joints, for example between the insulation system and window and door frame.

12.2 Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions and in accordance with BS EN 13914-1 : 2005.

13 Durability

 13.1 The system will have a service life of not less than 30 years provided any damage to the surface finish is repaired immediately and regular maintenance is undertaken, as described in section 12.

13.2 The finishes may break up the flow of water on the surface and reduce the risk of discoloration by water runs. The finish may become discoloured with time, the rate depending on locality, initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas. The appearance may be restored by a suitable power wash or, if required, by over coating.

14 Site survey and preliminary work

14.1 A pre-installation survey of the property must be carried out to determine suitability for treatment and the need for any necessary repairs to the building structure before application of the system. A specification is prepared for each elevation of the building indicating:

- the position of beads
- detailing around windows, doors and at eaves
- damp-proof course (dpc) level
- exact position of expansion joints, if required
- areas where flexible sealants must be used
- any alterations to external plumbing.

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers to determine the pull-out resistance of the proposed supplementary mechanical fixings. An assessment and recommendation is made on the type and number of fixings required to withstand the building's expected wind loading based on calculations using the test data and pull-out resistance (see section 7).

14.3 Surfaces should be sound, clean and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight-edge tool spanning the storey height. Any excessive irregularities, ie greater than 10 mm, must be made good prior to installation, to ensure that the insulation slabs are installed with a smooth, in-plane finished surface.

14.4 Where surfaces are covered with an existing rendering, it is essential that the bond between the background and the render is adequate. All loose areas should be hacked off and reinstated.

14.5 On existing buildings, purpose-made sills must be fitted to extend beyond the finished face of the system. New buildings should incorporate suitably deep sills.

14.6 Internal wet work, eg screeding or plastering, should be completed and allowed to dry prior to the application of the system.

15 Approved Installers

Application of the system, within the context of this Certificate, must be carried out by installers approved by the Certificate holder. A Certificate holder approved installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the system
- which has undertaken to comply with the Certificate holder's application procedure, containing the requirement for each application team to include at least one member operative trained by the Certificate holder
- subject to at least one inspection per annum by the Certificate holder to ensure suitable site practices are being employed. This may include unannounced site inspections.

16 Procedure

General

16.1 Application is carried out in accordance with the Certificate holder current installation instructions.

16.2 Weather conditions should be monitored to ensure correct application and curing conditions. The system should not be applied at temperatures below 5°C or above 30°C, if exposure to frost is likely or in damp/wet conditions and the render must be protected from rapid drying.

16.3 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2005.

Positioning and securing insulation slabs

16.4 The base profile is secured to the external wall above the dpc using mechanical fixings at a minimum of 300 mm centres. Profiles and expansion joints are fitted as specified.

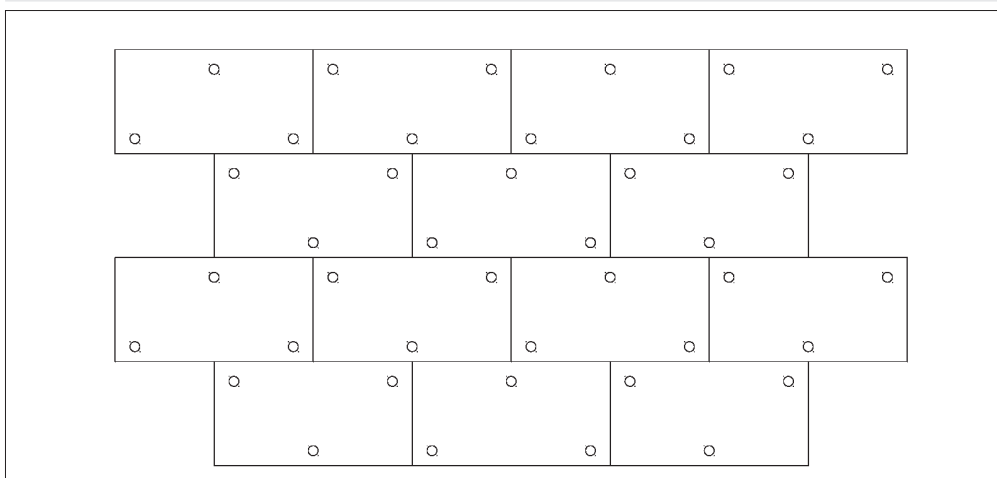
16.5 The adhesive is mixed in a suitable container using potable water and a high power drill and mixer spiral to create a paste-like mortar, whilst ensuring there are no clots in the mixed material. The insulation slabs are positioned on the starter track and initially bonded to the wall by applying the approved adhesive to the slabs using the strips and dots method. A circumferential strip of adhesive at least 5 to 10 cm wide is applied to the insulation slabs. Three evenly distributed patches of adhesive 5 to 10 cm in diameter are then applied to the slabs so that an adhesive surface of at least 50% is achieved. The insulation panel should be immediately placed on the substrate and pressed into place.

16.6 Subsequent rows of slabs are positioned so that the vertical slab joints are staggered and overlapped at the building corners.

16.7 Care must be taken to ensure that all insulation slab edges are butted tightly together, and alignment is checked as work proceeds. Gaps shall be filled with strips of the insulation material.

16.8 Details of mechanical fixings (including their arrangement in the insulation slabs) are specified in the project specific design requirements based on pull out test results and wind loading data. A minimum of 4.16 fixings per m² should be installed, unless otherwise specified in the project specific design (see Figure 2). Holes are drilled into the substrate through the insulation, and the fixings are installed, fixing tightly to the insulation slab using the dedicated driving system to ensure there is no risk of pull off. Installation of mechanical fasteners shall commence no earlier than 24 hours after the insulation panels have been adhesively fixed, and in any case after the adhesive has hardened. Care must be taken to ensure that the fixings are not overdriven.

Figure 2 Insulation slab fixing pattern



16.9 After sufficient stabilisation of the installed insulation (normally 2 days in warm and dry conditions, or a maximum of one week in cold and damp conditions, during which time the insulation should be protected from exposure to extreme weather conditions to prevent degradation), the wall is ready for the application of the basecoat.

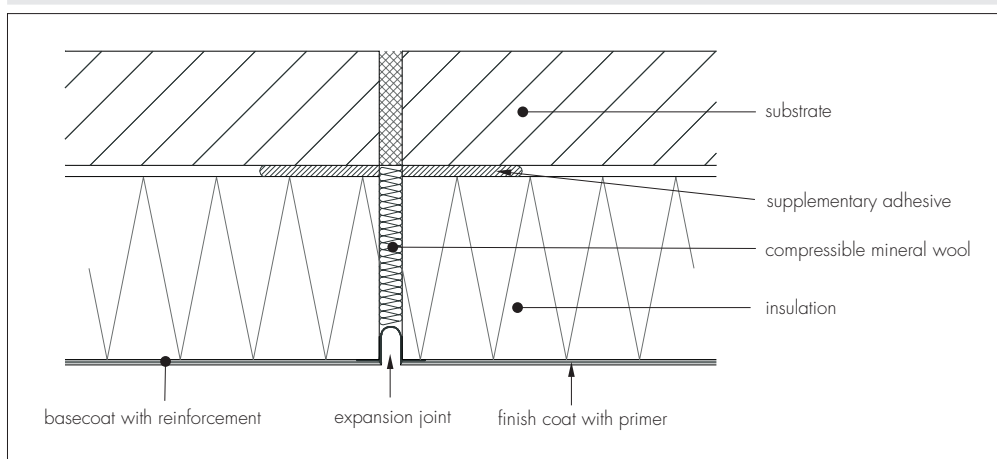
16.10 At all locations where there is a risk of insulant exposure, eg window reveals or eaves, the system must be protected, eg by an adequate overhang or by purpose made sub-sills, seals or flashing. Building corners, door and window heads and jambs are formed using profiles in accordance with the manufacturer's instructions.

16.11 To fit around details such as doors and windows, insulation slabs may be cut with a sharp knife. Purpose-made window sills, seals and deflection channels designed to prevent or manage water ingress and allow water to be shed clear of items bridging the cavity should be fitted. The performance of these components is outside the scope of this Certificate.

Movement joints

16.12 Movement joints should be incorporated where required. Existing structural expansion joints should be extended through to the surface of the insulation system (see Figure 3).

Figure 3 Movement joint detail

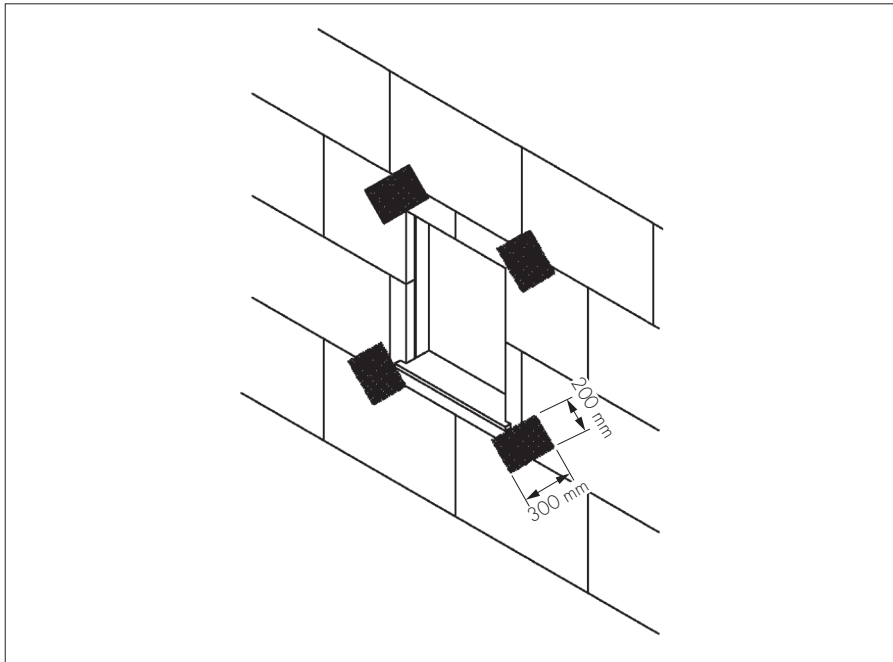


Basecoat and reinforcing

16.13 The basecoat is prepared as described previously. The material is applied over the insulation slabs, using a steel trowel to a thickness between 4 mm and 5 mm. The reinforcement mesh is immediately embedded into the coat, ensuring the mesh is overlapped at joints by a minimum coverage of 100 mm. Once the first coat has dried, a second coat of approximately 1 mm thickness is applied to obtain a smooth and uniform surface.

16.14 Additional pieces of reinforcing mesh are applied diagonally at the corners of openings to provide the necessary reinforcement in accordance with the Certificate holder's instructions (see Figure 4). Additional layers of mesh may be applied to improve impact resistance.

Figure 4 Additional reinforcement at openings



Rendering and finishing

16.15 Prior to the render coat, the relevant seals are positioned and installed at all openings (eg windows and doors), overhanging eaves, gas and electric meter boxes, wall vents or where the render abuts any other building material or surface. This helps to reduce the risk of water ingress into the structure.

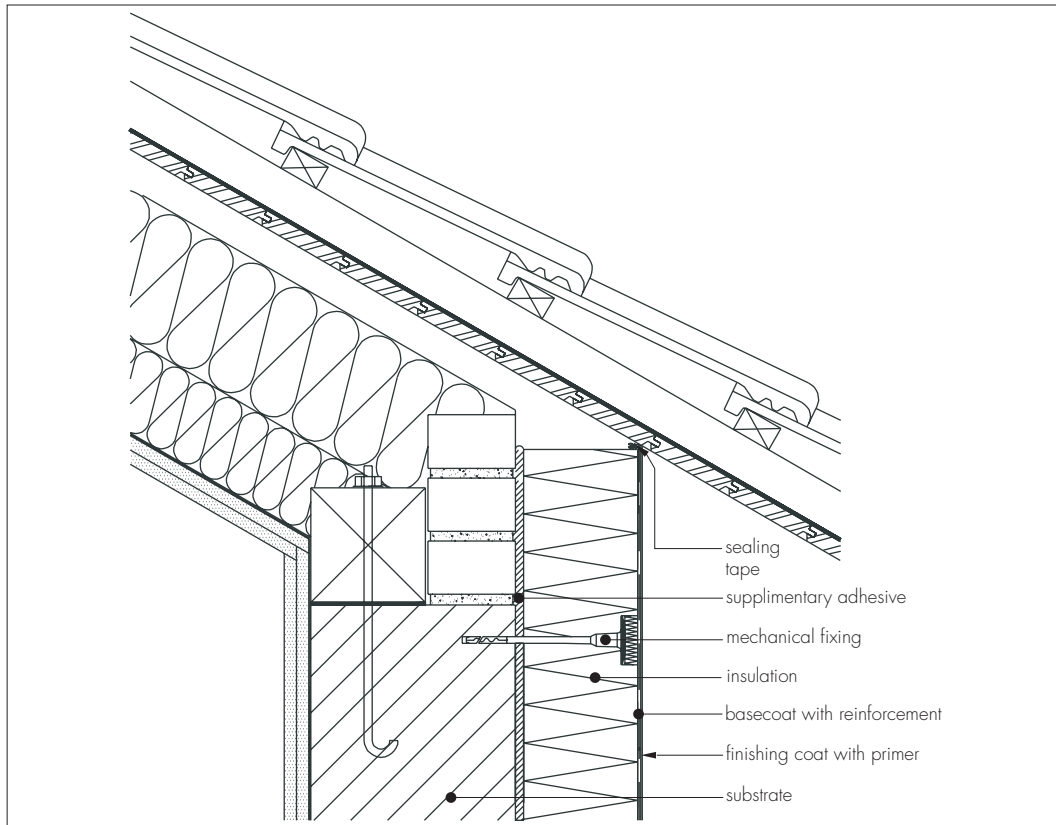
16.16 The basecoat must be allowed to dry/cure (approximately 2 to 3 weeks) prior to the application of the primer/finish coat. Prior to the application of the finishing coat, sealant should be applied as required, as defined in the project specific site package in accordance with the Certificate holder's instructions.

16.17 Primers (see section 1.1 for list of primers and their compatibility with the finishing coats) shall be applied in accordance with the Certificate holder's instructions and allowed to dry for approximately 24 hours prior to the application of the finishing coat.

16.18 Finishing coats are applied in accordance with the Certificate holder's instructions.

16.19 Care should be taken in the detailing of the system around features such as openings, projections and at eaves (see Figure 5) to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

Figure 5 Typical roof eaves detail



Technical Investigations

17 Tests

17.1 An examination was made of data relating to:

- component characterisation
- water vapour permeability
- water absorption
- bond strength
- reaction to fire
- pull-out strength of fixings
- durability of finish coatings
- heat/spray cycling
- impact resistance.

17.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and compositions of materials used.

17.3 An assessment of the risk of interstitial condensation was undertaken.

17.4 The practicability of installation and the effectiveness of detailing techniques were examined.

Bibliography

- BS 5250 : 2011 *Code of practice for control of condensation in buildings*
- BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*
- BS EN 1990 : 2002 *Eurocode — Basis of structural design*
- BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*
- BS EN 1996-2 : 2006 *Eurocode 6 : Design of masonry structures — Design considerations, selection of materials and execution of masonry*
- BS EN 13162 : 2012 *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification*
- BS EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
- BS EN 13914-1 : 2005 *Design, preparation and application of external rendering and internal plastering — External rendering*
- BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
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- BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*
- BRE Report (BR 135 : 2013) *Fire performance of external thermal insulation for walls of multistorey buildings*
- BRE Report (BR 262 : 2002) *Thermal insulation : avoiding risk*
- BRE Report BR (443 : 2006) *Conventions for U-value calculations*
- ETAG 004 : 2000 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) with Rendering*
- ETAG 004 : 2013 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) with Rendering*
- ETAG 014 : 2011 *Guideline for European Technical Approval of Plastic Anchors for fixing of External Thermal Insulation Composite Systems with Rendering*

18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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.