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Agrément Certificate

19/5693

Product Sheet 1

WIENERBERGER CLADDING SYSTEMS

CORIUM BRICK TILE CLADDING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Corium Brick Tile Cladding System for use as protective/decorative cladding over external masonry, concrete, timber- or steel-frame substrate walls of new and existing domestic and non-domestic buildings, installed either horizontally or vertically, or used overhead to create soffits and ceilings.

(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

Strength and stability — the system can be designed to resist wind actions normally encountered in the UK (see section 6).

Behaviour in relation to fire — the system components are Class A1 as defined in the national Building Regulations (see section 7).

Air and water penetration — the system minimises water penetration and the risk of damage to the inner wall (see section 8).

Durability — when used in normal exposure conditions, the system can have a design life in excess of 35 years (see section 10).



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

Paul Valentine
Technical Excellence Director

Claire Curtis-Thomas
Chief Executive

Date of First issue: 13 September 2019

Certificate amended on 26 March 2021 to update the introduction, sections 3, 4 and 6 and Figures 1, 2 and 4.

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.*

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Regulations

In the opinion of the BBA, the Corium Brick Tile Cladding System, 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:	A1	Loading
Comment:		The system is acceptable. See sections 4.3 and 6.2 to 6.4 of this Certificate.
Requirement:	B4(1)	External Fire spread
Comment:		The system can contribute to satisfying this Requirement. See section 7 of this Certificate.
Requirement:	C2(b)(c)	Resistance to moisture
Comment:		The system will contribute to satisfying this Requirement. See sections 8.1 to 8.4 of this Certificate.
Regulation:	7	Materials and workmanship (applicable to Wales only)
Regulation:	7(1)(2)	Materials and workmanship (applicable to England only)
Comment:		The system is acceptable. See section 10.1 and the <i>Installation</i> part 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 9 and 10.1 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Comment:		The system is acceptable, with reference to clause 1.1.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 4.3 and 6.2 to 6.4 of this Certificate.
Standard:	2.4	Cavities
Comment:		The system, when used in conjunction with fire-resistant materials, can satisfy this Standard, with reference to clauses 2.4.1 ⁽¹⁾⁽²⁾ , 2.4.2 ⁽¹⁾⁽²⁾ and 2.4.9 ⁽¹⁾⁽²⁾ . See section 7 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The system is regarded as 'non-combustible' and therefore can satisfy this Standard, with reference to clauses 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽²⁾ and 2.6.6 ⁽²⁾ . See section 7 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The system can contribute to satisfying this Standard, with reference to clauses 2.6.4 ⁽¹⁾⁽²⁾ and 2.7.1 ⁽¹⁾⁽²⁾ . See sections 7 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 3.10.6 ⁽¹⁾⁽²⁾ . See sections 8.1 to 8.4 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to meeting 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.

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 (as amended)

Regulation:	23(a)(i)(iii)(b)	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 10.1 and the <i>Installation</i> part of this Certificate.
Regulation:	28	Resistance to ground moisture and weather
Comment:		The system is not watertight but will resist the passage of rainwater to the supporting structure. See sections 8.1 to 8.4 of this Certificate.
Regulation:	30	Stability
Comment:		The system is acceptable. See sections 4.3 and 6.2 to 6.4 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The system can contribute to satisfying this Regulation. See section 7 of this Certificate.

Construction (Design and Management) Regulations 2015 Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.1) and 3 *Delivery and site handling* (3.2, 3.4, 3.6 and 3.7) of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, the Corium Brick Tile Cladding System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards, Part 6 Superstructure (excluding roofs)*, Chapter 6.9 *Curtain walling and cladding*.

Technical Specification

1 Description

1.1 The Corium Brick Tile Cladding System comprises longitudinally interlocking steel backing sections profiled to allow Corium Tiles to be clipped into it (see Figure 1). The vertical and horizontal joints between the tiles are pointed with Parex Historic Mortar KL which is a hydrated lime/sand and ground granulated blast furnace slag (GGBS) mortar manufactured to BS EN 998-2 : 2016. The nominal weight of the system including the mortar is approximately 68 kg·m⁻².

1.2 Corium Tiles are fired clay extruded brick tiles manufactured to the following nominal dimensions:

Height (mm)	50, 57.7, 65, 92, 140, 215
Length (mm)	215 ⁽¹⁾
Thickness (mm)	32
Tile lip thickness (mm)	13.

(1) Other lengths are available on request (outside the scope of this Certificate).

Corner tiles are made to the required specifications.

1.3 The steel backing rails are made of 0.55 mm thick stainless steel (grades 304 and 316) or 0.7 mm thick Magnelis metallic coated steel (ZM 310 and ZM 430), coated with a zinc-aluminium-magnesium alloy, manufactured to BS EN 10346 : 2015. The coating for Magnelis ZM 310 and ZM 430 steel is applied on both sides and is composed of zinc, 3.5% aluminium, 3% magnesium, with a coating weight of 310 and 430 g·m⁻², and coating thicknesses of 25 and 35 µm respectively.

1.4 The steel backing sections are profiled to suit the brickwork coursing height, mounted horizontally or vertically and mechanically fixed to the supporting subframe. The subframe is generally aluminium for use onto light weight steel frame and masonry substrates, or timber battens, for use onto timber-frame structures. The steel backing sections are fixed onto the aluminium subframe using a minimum of 5.5 x 25 mm (diameter x length) stainless steel self-drilling screws with an 8 mm hexagonal head and integral sealing washer (see Figure 1). For timber subframes the fixings must be specified by an appropriately qualified design engineer. The different brick tile dimensions are shown in Figure 2.

Figure 1 Corium Tile and steel backing profile (dimensions in mm)

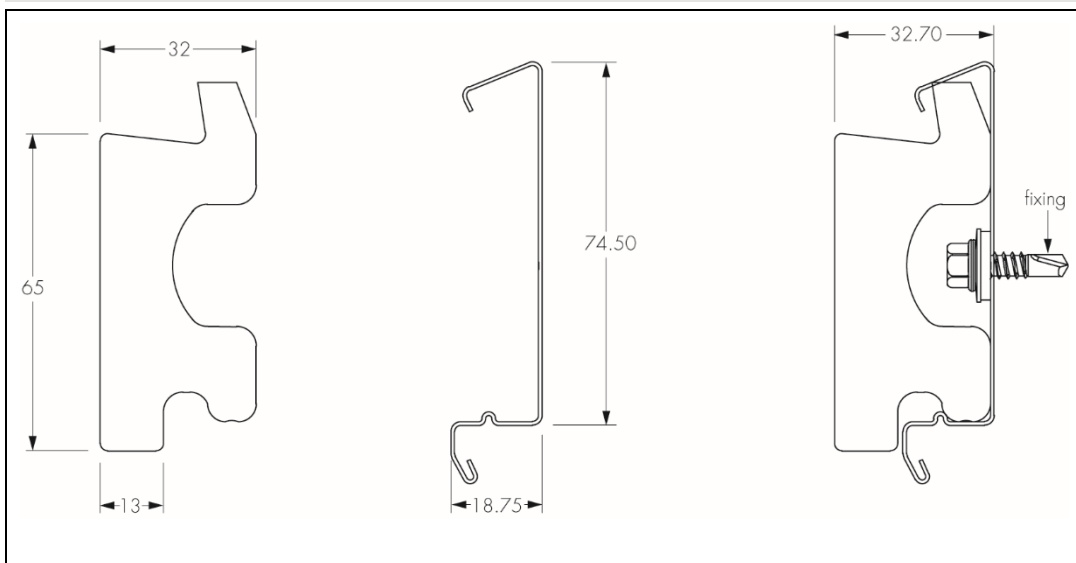
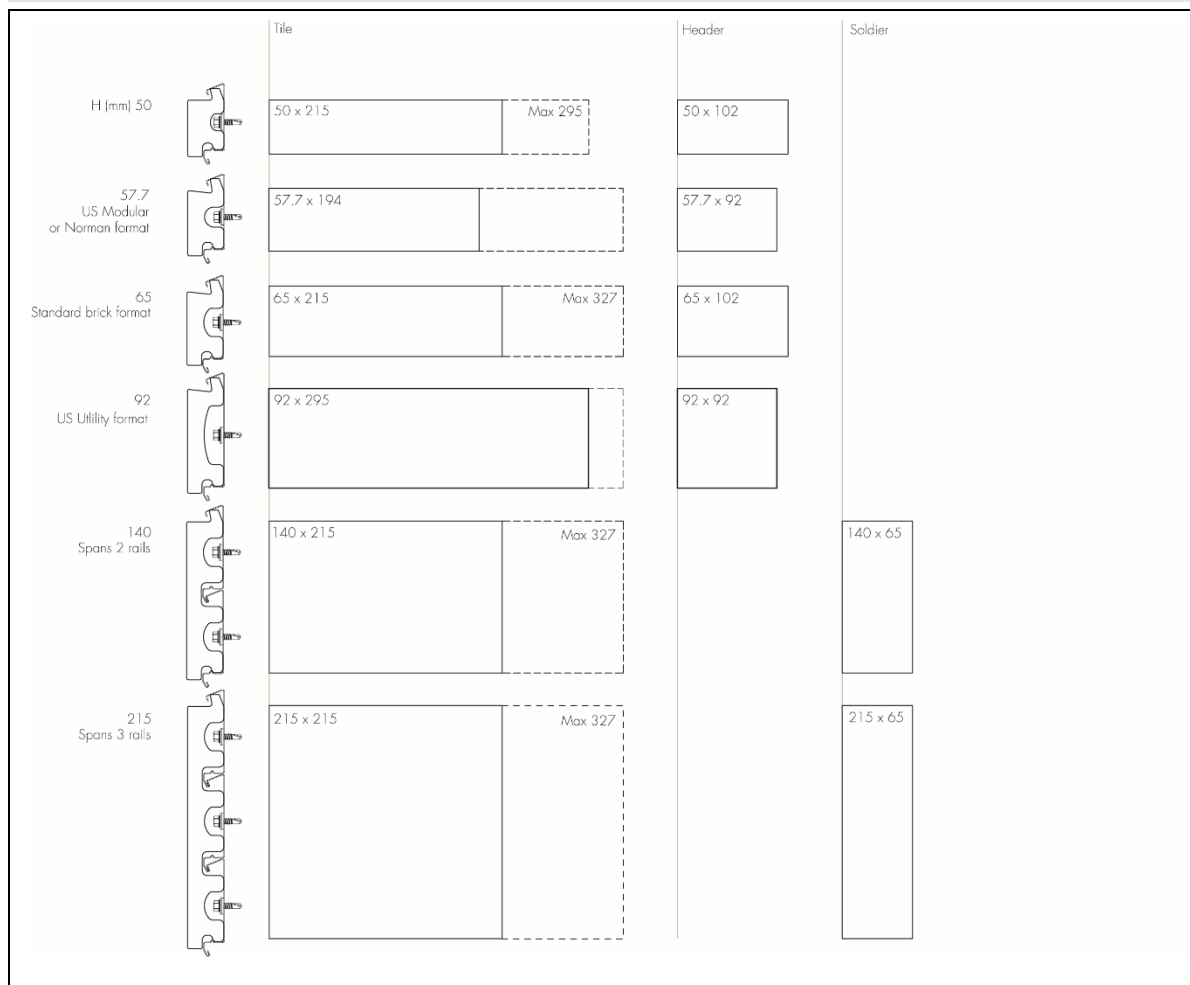


Figure 2 The Corium Brick Tile Cladding System □ tile size options



1.5 Ancillary items for use with the system, but which are outside the scope of this Certificate, are:

- cellular polyethylene or polyurethane material with a two-part polysulphide sealant
- compressible joint filler for use in the expansion joints
- support subframe
- insulation
- fire barriers
- breather membrane
- mechanical fixings to substrate
- substrate backing walls
- cavity protection mesh.

2 Manufacture

2.1 The Magnelis ZM 310 and ZM 430 coatings are applied to the steel substrate on a continuous hot dip galvanizing line. 304 and 316 stainless steel are austenitic grades. Grade 316 is manufactured with an addition of molybdenum for increased corrosion resistance. The steel is cold rolled to create the specially profiled backing sections (rails). Clay materials are extruded to form the tile profile. Finishes and textures are applied prior to firing.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities

- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

3.3 The management system of Wienerberger Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by Lucideon (Certificate 23461).

3 Delivery and site handling

3.1 The system components can be readily handled on site and may be cut or trimmed with the appropriate type of cutting equipment. Reasonable precautions must be taken to prevent damage before, during and subsequent to installation.

3.2 Standard tiles are delivered to site on timber pallets with polythene shrink wrapping, containing 960 units and weighting approximately 800 kg. Other packaging formats are available on request.

3.3 The pallets of tiles must be stored on a flat surface and in dry conditions.

3.4 The steel backing sections are delivered to site in 2.4 m lengths, banded in packs, stacked horizontally on sufficient bearers to prevent distortion. Each pack contains 90 rails (approximately 16.2 m²) and weighs approximately 156 kg (Magnelis) or 135 kg (stainless steel). They must be stored dry and supported on timber battens on level ground.

3.5 All steel backing sections must be cleaned carefully to remove all traces of cutting swarf etc, immediately after cutting, and must be checked for cleanliness before tile installation. They must not be exposed to any organic solvents.

3.6 Care should be exercised when handling steel backing sections to avoid injury from sharp edges. Protective clothing should be worn and all Health and Safety rules must be observed.

3.7 The mortar is packed in paper sacks of 25 kg bearing the batch number, date of production and application instructions. It must be stored in dry conditions, protected from frost and excessive heat, and used as stated on the material packaging.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Corium Brick Tile Cladding System.

Design Considerations

4 Use

4.1 The Corium Brick Tile Cladding System, when installed in accordance with this Certificate, is satisfactory for use as protective and decorative cladding on external walls of domestic and non-domestic buildings of masonry, concrete, timber- or steel-frame, above the damp-proof course (dpc) level.

4.2 It is important for designers, planners, contractors and/or installers to ensure that the installation of the system is in accordance with the Certificate holder's instructions and the information given in this Certificate. All design aspects should be checked by a suitably qualified and experienced individual in accordance with the requirements of the relevant national Building Regulations and Standards.



4.3 The substrate wall and support frame to which the system is to be fixed must be structurally sound, designed and constructed in accordance with the requirements of the relevant national Building Regulations and Standards:

- timber-frame walls must be designed and constructed in accordance with PD 6693-1 : 2012 and BS EN 1995-1-1 : 2004 and its UK National Annex, and preservative-treated in accordance with BS EN 351-1 : 2007
- steel-frame substrates must be structurally sound, and designed and constructed in accordance with BS EN 1993-1-1 : 2005 and BS EN 1993-1-3 : 2006, and their UK National Annexes
- masonry walls must be designed and constructed in accordance with the relevant recommendations of BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006, and their UK National Annexes, PD 6697 : 2010, BS 8000-0 : 2014 and BS 8000-3 : 2001
- concrete walls must be designed and constructed in accordance with the relevant recommendations of BS EN 1992-1-1 : 2004 and BS EN 1992-1-2 : 2004 and their UK National Annexes.

4.4 The system transfers its self-weight and design wind loads through the supporting subframe to the substrate wall. The substrate wall and supporting subframe must be capable of resisting the associated loads. Particular care is required around window and door openings to ensure that the structure is capable of sustaining the additional weight of the system. The maximum spacing between vertical subframe supports must not exceed 600 mm centres (horizontally). In a soffit situation the engineer should specify the sub-structure and number of fixings required based on the weight of the system and any other requirements, eg wind loads, etc.

4.5 Ventilation and drainage must be provided behind the system. The clear cavity between the back of the tile and substrate wall (or insulation if installed within the cavity) must be at least 15 mm wide, to ensure that a minimum ventilation area of 1000 mm² per metre run of cladding is achieved. Joint gaps between the tiles are filled in with pointing mortar. All ventilation openings around the periphery of the system should be suitably protected with mesh to prevent the ingress of birds, vermin and insects.

4.6 The substrate wall to which the system is fixed should be watertight.

4.7 Vertical expansion joints to allow for horizontal movement should be provided through tile, mortar and steel backing sections at a maximum of 12 m centres in the brick tile cladding. The actual spacing and position of the joints should coincide with movement joints in the substrate wall and allow for the same degree of movement. They should extend throughout the full height of the building including parapets etc. Movement joints in the structure of the building should be carried through to the face of the cladding.

4.8 Horizontal expansion joints, to allow for vertical movement, should be provided at a maximum of 9 m centres coincident with a floor and more frequently in timber-frame structures.

4.9 For steel-frame structures, reference to the structural engineer's details for deflection at floor level and movement joints in the substructure should be made.

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

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

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

5 Practicability of installation

The system must only be installed by installers who have been trained and approved by the Certificate holder.

6 Strength and stability

6.1 A suitably qualified and experienced individual must check that the design and installation of the system provides adequate resistance to design loads applicable in the UK.



6.2 Design wind actions must be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Due consideration should be given to higher pressure coefficients applicable to corners of the building, as recommended in this Standard. In accordance with BS EN 1990 : 2002, it is recommended that a partial load factor of 1.5 is applied to determine the design wind load to be resisted by the system.

6.3 The supporting substrate wall must have sufficient strength to resist, on its own, the loads imparted directly by the system and wind actions normally experienced in the UK, as well as any racking loads. No contribution from the system may be assumed in this respect.

6.4 A suitably qualified and experienced individual should ensure that:

- the design of the sub-frame is in accordance with the relevant Codes and Standards, and is such as to limit mid-span deflections to $L/200$ and cantilever deflections to $L/150$, where L is the span
- the proposed system and associated fixing layout provide adequate resistance to dead and wind loads
- the fixings attaching the backing rail to the support subframe have adequate pull-out strength to resist load imparted by the system
- fixing of the support subframe brackets to the substrate wall has adequate tensile pull-out and corrosion resistance (outside the scope of this Certificate). Site specific tests should be conducted on substrate walls to determine the minimum pull-out resistance to failure of the fixings. The characteristic pull-out resistance should be determined in accordance with the guidance given in EOTA TR 055, using 50% of the mean value of the five smallest measured values at the ultimate load.

6.5 Wind load tests were carried out to CWCT test specifications on a 6.0 x 6.0 m (height x length) wall comprising the Corium Brick Tile Cladding System fixed to vertical steel-frame supports⁽¹⁾ spaced at 600 mm centres horizontally, using 5.5 x 25 mm (diameter x length) stainless steel self-drilling screws with 8 mm hexagonal head for fixing horizontal to vertical rails and 4.8 x 19 mm (diameter x length) stainless steel self-drilling screws for fixing vertical rails to brackets. The ultimate wind pressure achieved in the tests is divided by partial material factor of 1.5 to derive the design resistance of the system, stated in Table 1.

Table 1 Design wind resistance

Type of rail	Design value (kN·m ⁻²)
Stainless steel 316	2.40
Magnelis ZM310 and ZM430 and Stainless steel 304	2.40

(1) The design wind resistance achieved for the system mounted onto metal supports also applies to the system mounted onto timber battens for use on timber frame structures.

Impact resistance

6.6 Hard and soft body impact tests were carried out with both Magnelis and stainless steel backing rail sections on a 2.6 x 3.2 m (height x length) wall comprising the Corium Brick Tile Cladding System, fixed to vertical steel-frame supports spaced at 600 mm centres horizontally. The systems achieved adequate impact resistance for use in the Impact Use Categories II, III and IV, as defined in EAD 090062-00-0404 : 2018, Table G.3, an extract of which is shown in the Table 2 of this Certificate.

Table 2 Definition of the impact use categories (from EAD 090062-00-0404 : 2018)

Use Category	Description
I	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use.
II	A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit 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.
III	A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.
IV	A zone out of reach from ground level.

Note: Use Category I shown for information only and is not suitable for the system.

7 Behaviour in relation to fire



7.1 The system components are Class A1 as defined by the national Building Regulations. This relates to the full range of thicknesses and mounting methods referred to in section 1 of this Certificate.

7.2 The panels and the steel subframe are classified as 'non-combustible' and are not subject to any restriction on building height or proximity to boundaries when used on a substrate and with components that satisfy the non-combustibility requirement of materials in the relevant national Building Regulations. When used in conjunction with combustible materials, the whole wall construction must satisfy the requirements of BRE Report BR 135 : 2013.

7.3 The timber subframe and substrate walls are not classified as 'non-combustible' or 'of limited combustibility' and so the system is restricted for use in buildings up to 18 metres in height, when used onto timber substrates.

7.4 The national Building Regulation guidance includes alternative approaches to those summarised in this Certificate, eg BRE Report BR 135 : 2013, but these are outside the scope of this Certificate.

7.5 Designers should refer to the relevant national Building Regulation guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance and combustibility limitations for other materials and components used in the overall wall construction, for example, thermal insulation.

7.6 For resistance to fire, the performance of a wall incorporating the system can only be determined by tests or assessment from a suitably accredited laboratory, and this is outside the scope of this Certificate.

7.7 To limit the risk of fire spread between the floors in buildings subject to the national Building Regulations, fire barriers must be incorporated in the cavity behind the system as required under these Regulations, but should not block essential ventilation pathways. Guidance on fire barriers can be found in BRE Report BR 135 : 2013.

8 Air and water penetration



8.1 The tiles have a mean water vapour resistance of $4.66 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$ when tested in accordance with EN ISO 12572 : 2001.

8.2 The cladding system is not airtight or watertight but will minimise water penetration and the risk of damage to the inner wall. Any water collecting in the cavity owing to rain or condensation will be removed by drainage and ventilation.

8.3 The substrate wall onto which the system is installed must be resistant to water ingress and satisfy the requirements of the relevant national Building Regulations and Standards for airtightness.

8.4 The minimum cavity width between the back face of the steel backing sections and the substrate wall (or insulation if installed within the cavity) should be 15 mm⁽¹⁾.

(1) Guidance on recommended cavity widths is given in *NHBC Standards 2019*, Chapter 6.9.

8.5 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of rain ingress. Only details approved by the Certificate holder should be used.

9 Maintenance and repair



9.1 A maintenance schedule for the installed system must include regular visual inspections:

- of the tiles for signs of damage
- of architectural details designed to shed water to confirm that they are performing properly
- to ensure that water is not leaking from external downpipes or gutters (such leakage could penetrate the cladding).

9.2 Maintenance should include the replacement or resealing of joints, for example between the cladding and window and/or door frames. Materials with signs of corrosion must be replaced.

9.3 Damaged tiles must be removed and replaced as soon as practicable and in accordance with the Certificate holder's instructions.

10 Durability



10.1 The durability and service life of the system will depend on the location, height and the intended use of the building, and the immediate environmental conditions. Provided regular maintenance is carried out, as described in this Certificate and in accordance with the Certificate holder's instructions, the system will have a design life in excess of 35 years in normal UK conditions. For use in very severe exposure zones the steel backing rail must be made of stainless steel grade 316 to obtain a design life in excess of 35 years.

10.2 After natural weathering, a slight change in colour of the tiles may occur. However, this is not likely to be progressive.

11 Reuse and recyclability

The system contains stainless steel and coated steel, which can be recycled.

Installation

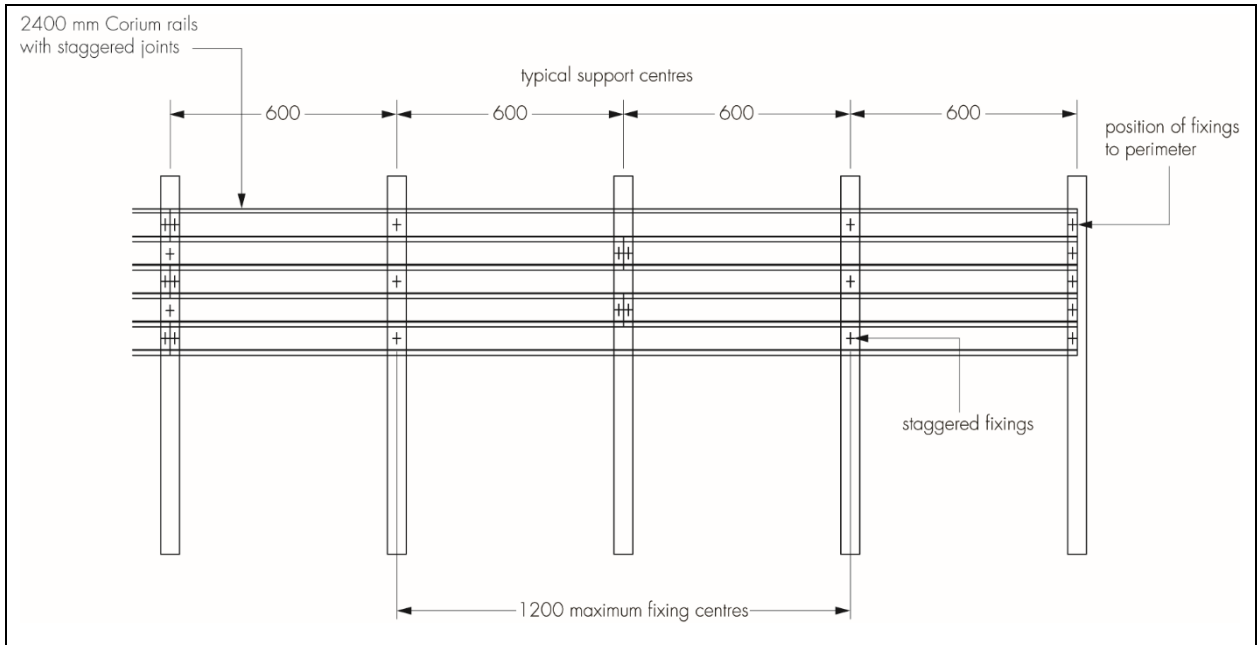
12 General

12.1 The Corium Brick Tile Cladding System must be installed in accordance with the Certificate holder's recommendations, the requirements of this Certificate and the specification laid down by the consulting engineer.

12.2 Installers must be trained and approved by the Certificate holder who can provide technical assistance at the design stage and at the start of the installation.

12.3 The substrate wall face to which the system is fixed should be flat, vertical and capable of supporting appropriate loads. Vertical subframe supports are required at maximum 600 mm centres. A typical fixing pattern of the Corium Brick Tile Cladding System is shown in Figure 3.

Figure 3 Typical fixing pattern of the Corium Brick Tile Cladding System



12.4 A typical installation of the Corium Brick Tile Cladding System onto steel- and timber-frame is shown in Figure 4.

Figure 4 Installation detail of the Corium Brick Tile Cladding System

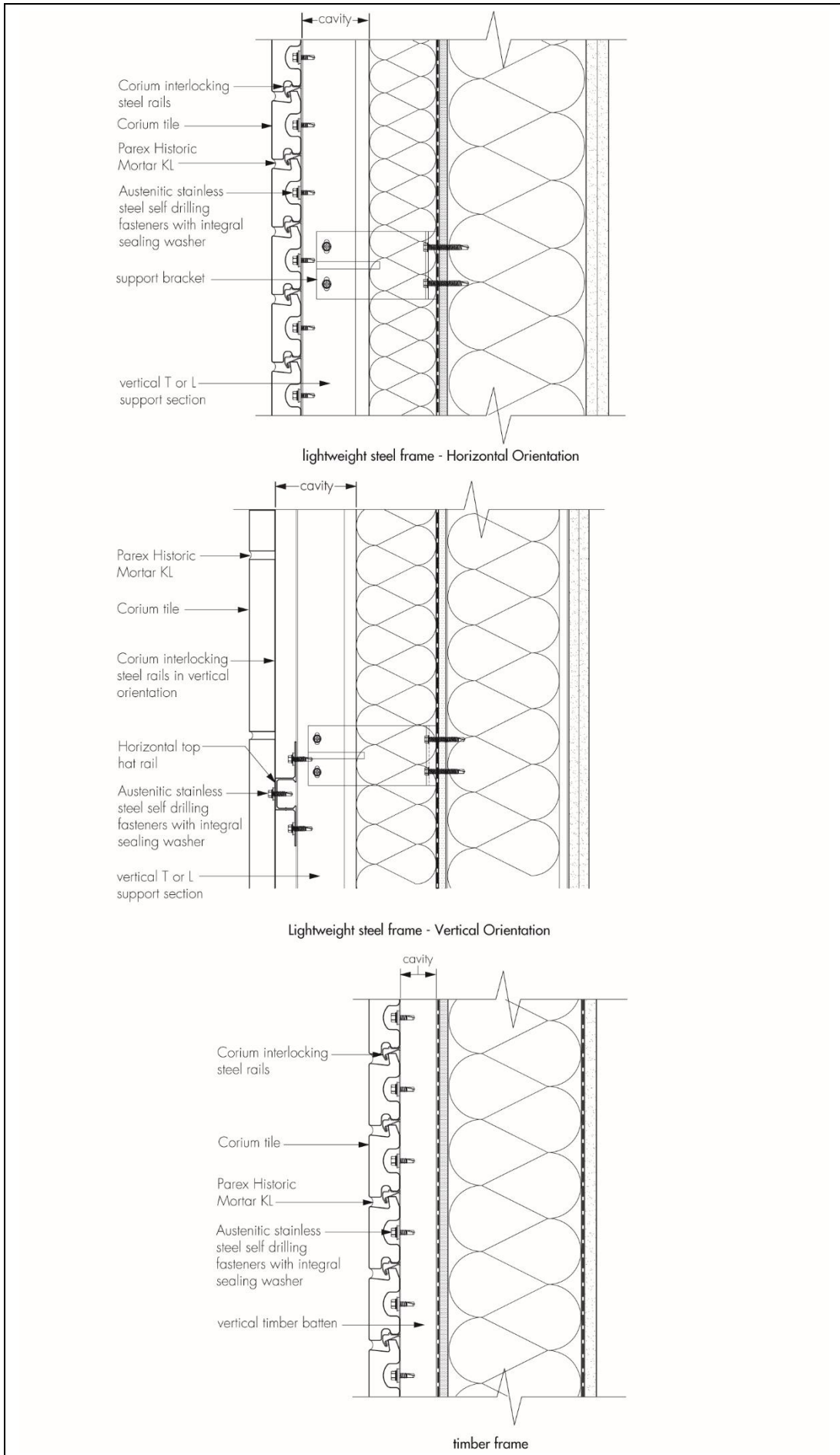
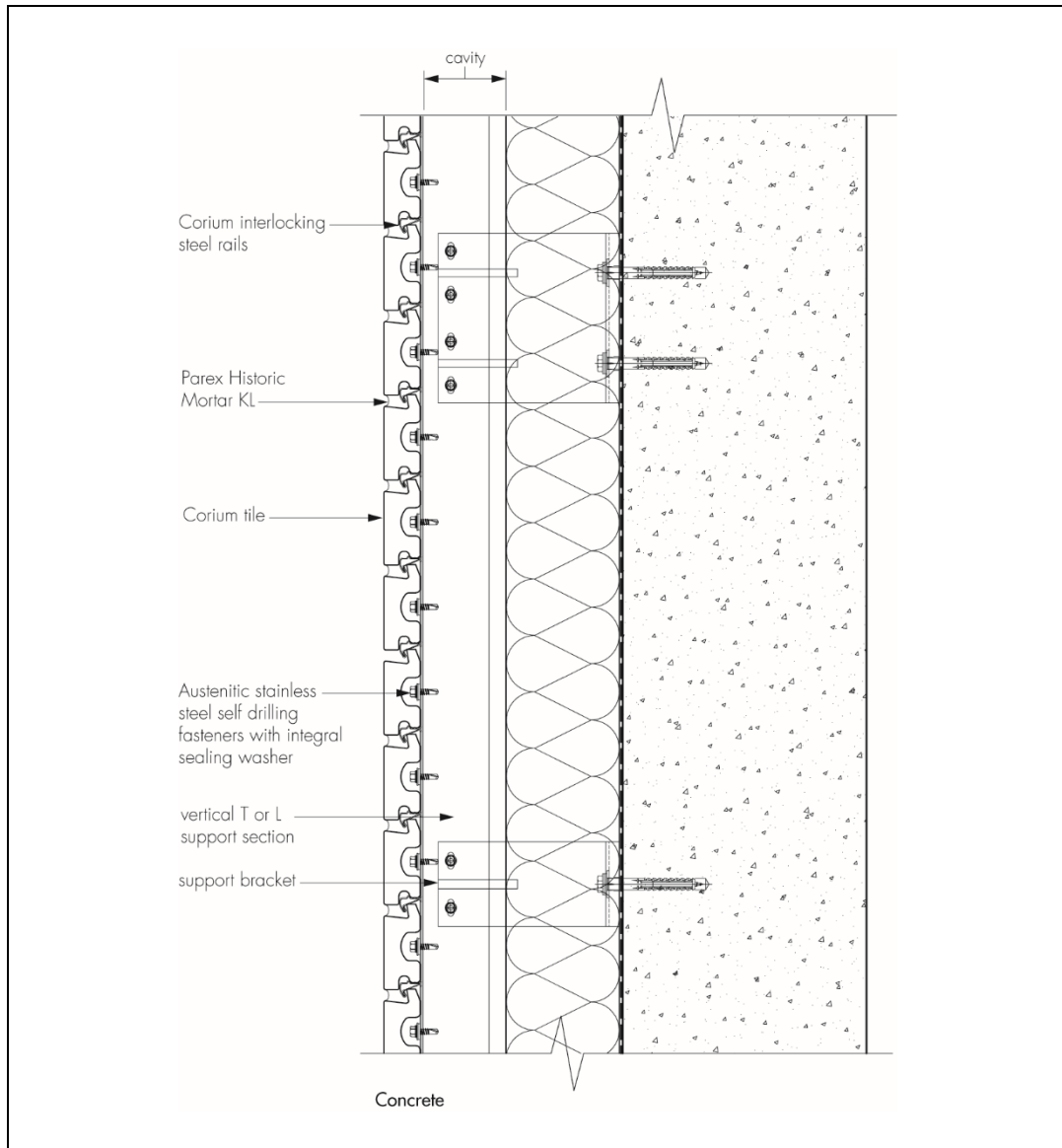


Figure 4 Installation detail of the Corium Brick Tile Cladding System (continued)



13 Procedure

13.1 Accurate setting out of the system must be achieved. The first steel backing section must be positioned level and fixed to the supporting structure. The next steel profile must be aligned alongside to provide a continuous run or engaged to lie parallel to the adjacent profile.

13.2 The steel profiles must be fixed with the specified mechanical fixings at not less than 18 fixings per square metre. It must be ensured that all steel backing sections are clipped together using the interlock action of the formed sections.

13.3 The top steel backing section is levelled and fixed at two points, whilst allowing those below to hang freely. The intermediate section(s) is then re-positioned horizontally to form staggered joints as required, and the bottom section is then aligned vertically with the measuring tool supplied, and secured.

13.4 The steel profiles must be fixed at a maximum of 1200 mm centres along their length. Fixings should be staggered between adjacent vertical steel backing sections as shown in Figure 3. Tiles will not interfere with the head of the fixings as it has a continuous horizontal recess in its back face.

13.5 Tiles are inserted into the steel backing section, with the top of the tile first. Applying a slight cushioned blow with a rubber mallet to the bottom of the tile forces it into its desired location. Care must be taken to minimise the risk of abrasion to the steel backing sections.

13.6 The position of the tile should be set out from the corners inwards on each elevation adjusting the vertical joint width to suit variations in the tile lengths. It must always be checked that the tiles are fitted fully into the steel backing section.

13.7 Pointing mortar is applied using manual, mechanical or compressed air based pumps with controlled nozzle applicators.

Technical Investigations

14 Tests and investigations

14.1 Tests were conducted and the results assessed to determine:

- wind load resistance
- pull-through resistance
- hard and soft body impact
- water vapour permeability
- reaction to fire
- fire resistance
- hygrothermal behaviour
- freeze/thaw resistance
- weathertightness.

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

Bibliography

- BRE Report BR 135 : 2013 *Fire performance of external thermal insulation for walls of multi-storey buildings*
- BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*
BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*
- BS EN 351-1 : 2007 *Durability of wood-based products — Preservative treated solid wood — Classification of preservative penetration and retention*
- BS EN 998-2 : 2016 *Specification for masonry — Masonry mortar*
- BS EN 1990 : 2002 *Eurocode — Basis of structural design*
- 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 1993-1-1 : 2005 + A1 : 2014 *Eurocode 3 — Design of steel structures — General rules and rules for buildings*
NA to BS EN 1993-1-1:2005 + A1 : 2014 National Annex to *Eurocode 3 — Design of steel structures — General rules and rules for buildings*
BS EN 1993-1-3 : 2006 *Eurocode 3 — Design of steel structures — General rules*
NA to BS EN 1993-1-3 : 2006 National Annex to *Eurocode 3 — Design of steel structures — General rules*
- 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 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 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 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 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 calculations methods for unreinforced masonry structures*
NA+A1 : 2014 to BS EN 1996-3 : 2006 National Annex to *Eurocode 6 — Design of masonry structures — Simplified calculations methods for unreinforced masonry structures*
- BS EN 10346 : 2015 *Continuously hot-dip coated steel flat products — Technical delivery conditions*
- BS EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
- BS EN ISO 9001 : 2015 *Quality management systems — Requirements*
- EAD 090062-00-0404 : 2018 *Kits for External Wall Cladding Mechanically Fixed*
- EN ISO 12572 : 2001 *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties — Cup method*
- EOTA TR 055 *Determination of the resistance to wind loads of partially bonded roof waterproofing membranes*

15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

15.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

15.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

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

15.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

15.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.