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Agrément Certificate

17/5475

Product Sheet 2

BRICK FACING UNITS

PRO-CLAD BRICK SLIP FACINGS FOR CLADDING PANELS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Pro-Clad Brick Slip Facings for Cladding Panels, for use on external walls up to a height of 18 metres. This Certificate covers the effectiveness of the bond between the brick slips and the magnesium oxide cladding panel, and not the performance of the panel itself, or the sub-frame to which it is fixed.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

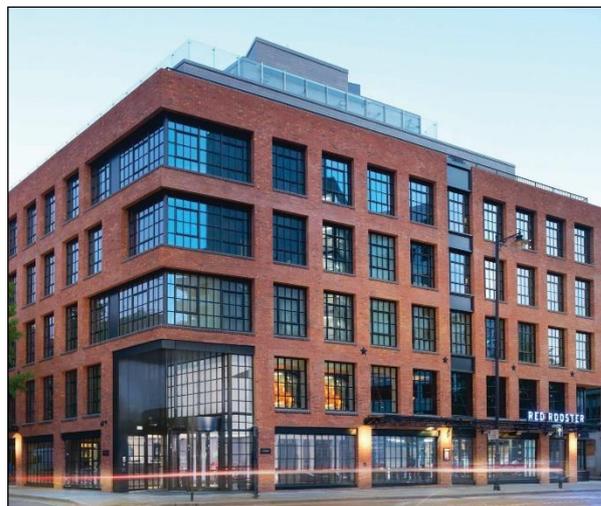
- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance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

KEY FACTORS ASSESSED

Resistance to frost damage — the bond between the brick slips and the magnesium oxide cladding panel is durable and stable when subjected to freeze/thaw cycling (see section 6).

Strength and stability — the cladding panels can resist wind loadings likely to be met in the UK but a design assessment is required in each case for a particular location (see section 7).

Durability — brick slips attached to the magnesium oxide cladding panel will retain their adhesion, giving a service life equivalent to that of other similar brick masonry (see section 10).



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

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'John Albon'.

John Albon – Head of Approvals
Construction Products

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

Claire Curtis-Thomas
Chief Executive

Date of First issue: 4 July 2018

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.

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, Pro-Clad Brick Slip Facings for Cladding Panels, 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 products can sustain and transmit wind loads to the structural frame. See section 7 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The products can satisfy this Requirement. See section 8 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The products are acceptable. See section 10 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The products can contribute to a construction satisfying this Regulation. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1	Structure
Comment:		The products can sustain and transmit wind loads to the structural frame. See section 7 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The products can satisfy this Standard. See section 8 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The products can satisfy this Standard. See section 8 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products 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:		Comments in relation to the products 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)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The products are acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation:	30	Stability
Comment:		The products can sustain and transmit wind loads to the structural frame. See section 7 of this Certificate.

Regulation:	36(a)	External fire spread
Comment:	The products can satisfy this Requirement. See section 8 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 (3.1)* of this Certificate.

Technical Specification

1 Description

- 1.1 Pro-Clad Brick Slip Facings for Cladding Panels are made from bricks to BS EN 771-1 : 2011. The Certificate holder can advise on suitable brick specifications.
- 1.2 The cladding panels are based on 9 mm thick magnesium oxide boards, manufactured to a defined specification.
- 1.3 The bonding agent is Brick-fix 3-1, a two-part gap-filling epoxy adhesive covered by BBA Certificate 16/5328.
- 1.4 The fabricated panels are supplied in two designs, Pro-Clad 1 and Pro-Clad 2, see Figures 1 and 2. The only difference is the requirement for Pro-Clad 1 to site-fix an individual connecting brick slip on every second row. Pro-Clad 2 can be installed on site without the need for this extra step.
- 1.5 The fabricated panels are supplied in various sizes/designs to enable entire facias to be constructed, including:
- six course panels
 - four course panels
 - soffit panels
 - corner panels
 - panels incorporating window jambs
 - standalone window jamb panels.
- 1.6 The fixings used are IWS-5 x 45 mm stainless steel screws. Other fixings can be used provided they can be demonstrated to have equal or higher pull-out, head diameter and stiffness characteristics.
- 1.7 A lime-based pointing mortar is used to fill the mortar courses after installation.

Figure 1 Pro-Clad 1

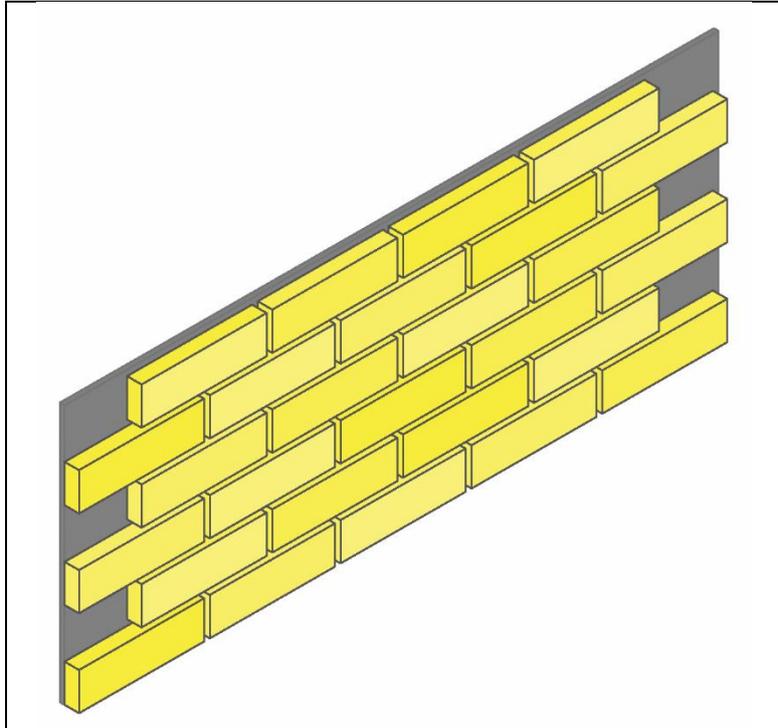
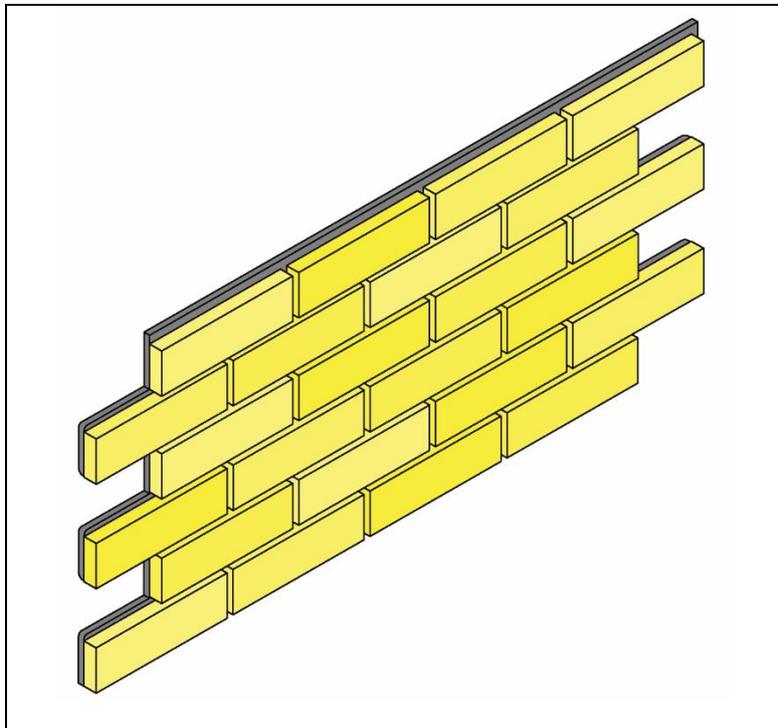


Figure 2 Pro-Clad 2



2 Manufacture

2.1 The finished brick-clad units are manufactured in the UK by Fab-Cladding Limited, 82 Lime Pit Lane, Stanley, Wakefield WF3 4DF.

2.2 In a factory-controlled process, bricks are either cut or purpose made brick slips are bonded to the magnesium oxide panels.

2.3 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.

2.4 The management systems of Fab-Steel Limited have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by QMS International Ltd (Certificate 14128082).

3 Delivery and site handling

3.1 The cladding panels are stacked with protective foam between the units and shrink-wrapped onto pallets. They are suitable for offloading using fork-lift trucks.

3.2 The cladding panels are labelled with a project reference code, unit type, production date and check initials.

3.3 The cladding panels should be stored clear of the ground on a dry, level area, and protected from rain and snow until required for use, in accordance with normal good practice.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Pro-Clad Brick Slip Facings for Cladding Panels.

Design Considerations

4 Use

4.1 Pro-Clad Brick-Slip Facings for Cladding Panels are factory-bonded to magnesium oxide to produce two cladding panel designs, Pro-Clad 1 and Pro-Clad 2 (see Figures 1 and 2). They are then attached to various structures via timber battens to produce the external skin of the building.

4.2 This Certificate only covers the durability of the bond between the brick facings and the magnesium oxide panels. No assessment has been made of the properties of the panels to which the brick slips have been bonded, or the framework used to support the panels. The design and installation of the support frame and the cladding panels is outside the scope of this Certificate.

4.3 No assessment has been made of the contribution of epoxy-bonded brick slips to the fire resistance of the structure on which they are incorporated.

4.4 New walls should be constructed in accordance with the relevant recommendations for:

- galvanized steel framework, which must be structurally sound, designed and constructed in accordance with BS EN 1993-1-1 : 2005 and BS EN 1993-1-3 : 2006, and other parts where appropriate
- timber stud walls and timber battens, which must be structurally sound, designed and constructed in accordance with BS EN 1995-1-1 : 2004, and preservative treated in accordance with BS EN 351-1 : 2007.

5 Practicability of installation

The cladding panels should be installed by a competent contractor experienced with these types of products.

6 Resistance to frost damage

6.1 The type of facing brick chosen for a particular exposure situation should comply with PD 6697 : 2010, Table 15.

6.2 The bond between the facing brick and the magnesium oxide panel is durable and stable when subjected to freeze/thaw cycling.

7 Strength and Stability



7.1 When tested for dynamic wind load in accordance with ETAG 004 : 2013, a built-up system including the following achieved a design wind load resistance of 3.0 kPa⁽¹⁾ without failure:

- softwood timber battens (38 x 50 mm) fixed to a masonry wall at 450 mm centres
- Pro-Clad 1 panels fixed to every batten using IWS-5 x 45 mm stainless steel screws at a rate of one fixing every two brick courses
- mortar courses filled using lime-base pointing mortar.

(1) Obtained by applying a safety factor of 1.5 to the test value.

7.2 The wind loads on the wall, and the panels' ability to sustain these, should be calculated for each installation by a suitably experienced and competent individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Special consideration should be given to locations with high wind-load pressure coefficients (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 products

8 Behaviour in relation to fire



The surface of the Pro-Clad panels consists of brick slips and mortar, both of which are inorganic and therefore non-combustible. The backing panel achieves a rating of A1 when classified in accordance with BS EN ISO 13501-1 : 2002.

9 Maintenance

The bond between the brick facings and the panels is durable and does not require maintenance. Should damage to the bonded bricks occur, the damaged section is removed back to sound substrate and repaired. The Certificate holder should be consulted on the technique to be used.

10 Durability



Pro-Clad Brick Slip Facings for Cladding Panels will retain their adhesion and have a service life equivalent to that of other similar brick masonry.

Installation

11 General

11.1 The cladding panels are installed in accordance with the Certificate holder's instructions and the structural design calculations (see sections 4.2 and 7).

11.2 When using Pro-Clad 1 panels, linking brick slips must be site-applied every second course according to the method statement available from the Certificate holder.

11.3 Only Brick-Fix 3-1, available from the Certificate holder, is to be used for site fixing of the linking brick slips. Brick-Fix 3-1 has a shelf life of 2 years when stored in unopened containers at temperatures of between 5 and 25°C, and should only be used when ambient, substrate and material temperatures are between 2 and 30°C.

11.4 The Pro-Clad board must be clean, free from dust, and dry. Brick-Fix 3-1 is mixed using a metal scraper on a suitable flat mixing board, at a ratio of 3 : 1 base : reactor by weight/volume. The mixing is carried out until a consistent colour, free of streaks, is achieved.

11.5 The brick slips must be dry and free from dust. The adhesive is applied at a thickness of approximately 2 mm to the entire back face of the brick slip, which is then pressed into place, ensuring the front of the face is level with slips on both sides. Temporary packers are placed under the slip to hold it in place for a minimum of 12 hours, until the resin has fully cured at which point the packers are removed.

11.6 Lime-based pointing mortar is applied to the installed panels in accordance with the Certificate holder's instructions.

Technical Investigations

12 Tests

Tests were carried out and the results assessed to determine:

- bond strength of brick slips adhered to magnesium oxide board after exposure to heat ageing, thermal shock and freeze/thaw conditioning
- dynamic wind load resistance in accordance with ETAG 004 : 2014.

13 Investigations

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

Bibliography

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

BS EN 771-1 : 2011 + A1 : 2015 *Specification for masonry units — Clay masonry units*

BS EN 1990 : 2002 + A1 : 2005 *Eurocode — Basis of structural design*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions*

NA to BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions*

BS EN 1993-1-1 : 2005 + A1 : 2014 *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 — Supplementary rules for cold-formed members and sheeting*

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

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

BS EN ISO 13501-1 : 2002 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

PD 6697 : 2010 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*

ETAG 004 : 2013 *Guideline for European technical approval of external thermal insulation composite systems (ETICS) with rendering.*

14 Conditions

14.1 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 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.

14.2 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.

14.3 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.

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

14.5 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.

14.6 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.