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### Agrément Certificate

17/5428

Product Sheet 1

## BUILDING ADHESIVES LTD MAGNESIUM OXIDE BOARDS

### BAL BOARD, BAL BOARD AP AND BAL RENDER BOARD

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to BAL Board, BAL Board AP and BAL Render Board, magnesium oxide boards. BAL Board and BAL Board AP are for use as internal wall sheathing and BAL Render Board as a render carrier board in domestic and non-domestic timber-frame buildings.

(1) Hereinafter referred to as 'Certificate'.

#### CERTIFICATION INCLUDES:

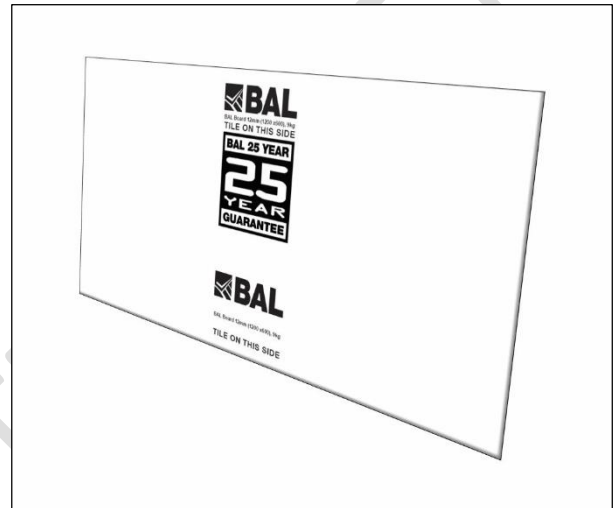
- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance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

#### KEY FACTORS ASSESSED

**Strength and stability** — partition walls incorporating the boards will have acceptable resistance to stresses (see section 6).

**Behaviour in relation to fire** — the boards can be incorporated in a construction meeting regulatory requirements (see section 7).

**Durability** — the sheathing boards will have a life equal to that of the building in which they are installed (see section 13).



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

Date of First issue: 5 June 2017

*Brian Chamberlain*

Brian Chamberlain  
Head of Technical Excellence

*Claire*

Claire Curtis-Thomas  
Chief Executive

Certificate amended on 24 April 2020 to remove NHBC statement..

The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)  
Readers 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, BAL Board, BAL Board AP and BAL Render Board, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



### The Building Regulations 2010 (England and Wales) (as amended)

<b>Requirement:</b>	<b>B2</b>	<b>Internal fire spread (linings)</b>
Comment:	The products can satisfy this Requirement for use in all locations. See sections 7.1 to 7.4 and 7.6 and 7.7 of this Certificate.	
<b>Requirement:</b>	<b>B3</b>	<b>Internal fire spread (structure)</b>
Comment:	The products can contribute to satisfying this Requirement. See sections 7.1 to 7.4 and 7.6 and 7.7 of this Certificate.	
<b>Requirement:</b>	<b>C2(b)(c)</b>	<b>Resistance to moisture</b>
Comment:	The products can be incorporated into a wall structure suitably designed to prevent excessive interstitial and surface condensation. See section 9 of this Certificate.	
<b>Regulation:</b>	<b>7</b>	<b>Materials and workmanship</b>
Comment:	The products are acceptable. See sections 13.1 and 13.2 and the <i>Installation</i> part of this Certificate.	



### The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:	The use of the products satisfy the requirements of this Regulation. See sections 13.1 and 13.2 and the <i>Installation</i> part of this Certificate.	
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	2.2	Separation
Standard:	2.3	Structural protection
Standard:	2.5	Internal linings
Comment:	The products can contribute to satisfying regulatory requirements, with reference to clauses 2.2.1 <sup>(1)(2)</sup> , 2.2.2 <sup>(1)</sup> , 2.2.3 <sup>(1)</sup> , 2.2.4 <sup>(1)</sup> , 2.2.6 <sup>(1)</sup> , 2.2.8 <sup>(1)</sup> , 2.3.2 <sup>(1)</sup> and 2.5.1 <sup>(1)</sup> . See sections 7.1 to 7.4 and 7.6 and 7.7 of this Certificate.	
Standard:	7.1(a)(b)	Statement of sustainability
Comment:	The products can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.	
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:	All comments given for the products under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .	

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



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

<b>Regulation:</b>	<b>23(a)(i)(iii)(b)</b>	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>		The products are acceptable. See sections 13.1 and 13.2 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>34</b>	<b>Internal fire spread — Linings</b>
<b>Comment:</b>		Walls incorporating the products can satisfy this Regulation. See sections 7.1 to 7.4 and 7.6 and 7.7 of this Certificate.
<b>Regulation:</b>	<b>35</b>	<b>Internal fire spread — Structure</b>
<b>Comment:</b>		The products can contribute to satisfying regulatory requirements. See sections 7.1 and 7.4 and 7.6 and 7.7 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: 3 *Delivery and site handling* (3.3) and 14 *General* (14.1 and 14.4) of this Certificate.

## Technical Specification

### 1 Description

1.1 BAL Board, BAL Board AP and BAL Render Board are manufactured from a mixture of magnesium oxide, calcium carbonate and magnesium chloride and fibreglass mesh reinforcement.

1.2 The boards are available in the dimensions given in Table 1.

Table 1 Board characteristics and dimensions

Characteristic (unit)	BAL Board	BAL Board AP	BAL Render Board
Thickness ( $\pm 0.2$ mm)	6, 9, 12	6.5, 9, 12	9, 12
Width (mm) x length (mm)	1200 x 800	—	—
	1200 x 1220	—	—
	1200 x 2400	1200 x 2400	1200 x 2440
	1220 x 2440	1200 x 2440	—
	—	1200 x 2700	—
	1200 x 3050	1200 x 3050	—
Edge finish	square	square	Square
Fibreglass mesh layers	2	4	4
Density ( $\text{kg}\cdot\text{m}^{-3}$ )	1050	1050	1050
Thermal conductivity ( $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ )	0.307	0.307	0.307

1.3 BAL Render Board is for use as a render carrier board in conjunction with the render systems given in Table 2. The board is fixed to timber-frame walls via vertical timber battens, minimum 25 mm deep, at 600 mm maximum centres using 4.8 by 42 mm self-drilling stainless steel screws (BMDW4842) at 300 mm centres.

1.4 Ancillary items used in conjunction with the boards but outside the scope of this Certificate are:

- timber-frame substrate wall
- timber battens

- external render systems other than those specified in Table 2
- render beads
- expansion joint beads
- silicone sealant
- insect mesh
- stainless steel screws — self-tapping countersunk head for timber stud and self-tapping countersunk head case hardened carbon steel screw wing.

## 2 Manufacture

2.1 The boards are manufactured by controlled methods using a natural cure process.

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 Delivery and site handling

3.1 Boards are stacked on timber pallets. Each pack contains a label incorporating the product name, thickness, width, length, batch number and number of boards per pallet.

3.2 Boards must be stored horizontally in a ventilated and dry environment on a flat level, raised surface under cover indoors and protected from the weather. The boards must not be kept upright for long periods of time.

3.3 The boards should always be lifted by at least two people and not dragged across each other to prevent unnecessary scratching or damage. Boards should be carried on edge and extra precaution should be taken to protect the visible front edge and corners.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on BAL Board, BAL Board AP and BAL Render Board.

## 4 General

4.1 BAL Board, BAL Board AP and BAL Render Board are satisfactory for use in the following applications:

- BAL Board — as passive fire protecting internal wall liner, soffit liner and tile backer board and in applications where impact and fire resistance are required
- BAL Board AP — as a structural sheathing board for racking resistance purposes fixed to timber-frame walls with timber supports at 600 mm maximum centres
- BAL Render Board — as a render carrier board (see Figure 1) in conjunction with the render systems given in Table 2. The board is fixed to timber-frame walls via vertical timber battens at 600 mm maximum centres using 4.8 by 42 mm self-drilling stainless steel screws (BMDW4842) at 300 mm centres.

Figure 1 BAL Render Board

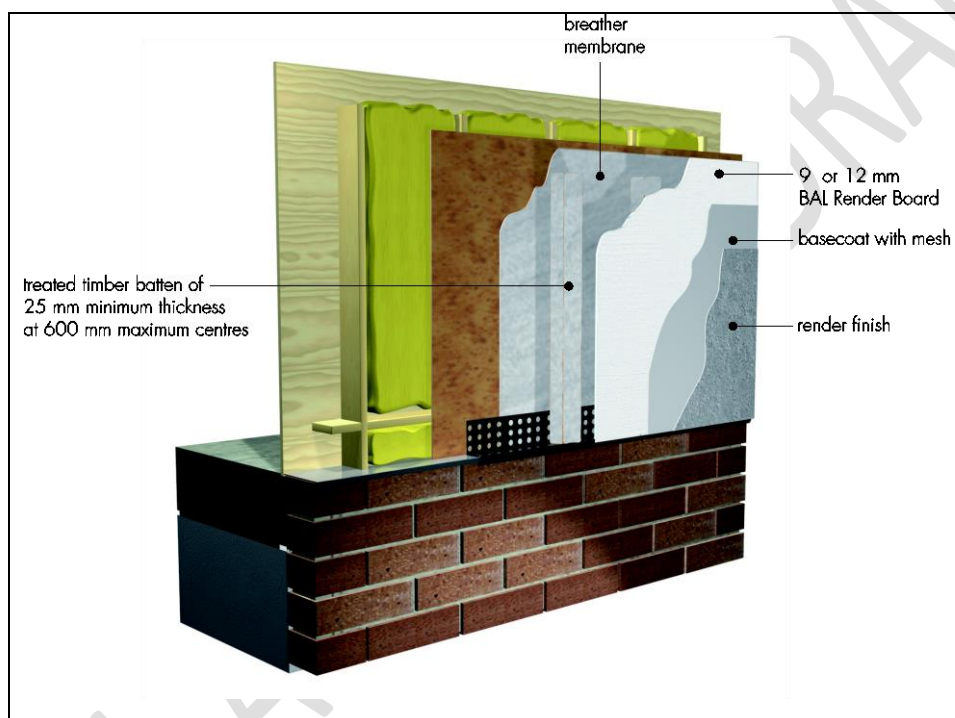


Table 2 Render systems for use with BAL Render Board

Component	Render system	
	Alsecco	K Rend
Basecoat	Alsecco Armatop L-Aero	K Rend HP12 basecoat
Mesh	Alsecco mesh	K Rend mesh
Primer	Alsecco Primer	K Rend Primer TC003
Render	Alsecco silicone render	K Rend TC15 Silicone render

4.2 The design of the BAL Render Board system should include:

- a 25 mm minimum ventilated and drained cavity system incorporating an insect mesh to all ventilation openings
- effective detailing around window openings to ensure that wind-driven rain is excluded from hidden members in the surround and from the cavity
- an effective breather membrane on the inside, to ensure the frame structure is protected.

4.3 The boards achieve the following classification in accordance with BS EN 12467 : 2012, clause 5.2:

- weather resistance — Category B (sheets which are intended for applications where they may be subjected to heat, moisture and occasional frost, eg where they are either protected from or not subjected to severe weathering conditions)
- bending strength — Class 2
- dimensional tolerance — Level 1.

4.4 The timber-frame substrate walls and timber battens 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 boards are designed to be installed in accordance with this Certificate and the Certificate holder's installation instructions by a competent builder, or a contractor, experienced with these types of products.

## 6 Strength and stability

### General

6.1 A suitably qualified and experienced individual must check the design and method of installation of the boards.

6.2 Wind actions should be calculated in accordance with BS EN 1991-1-4 : 2005. Due consideration should be given to the higher pressure coefficients applicable to corners of the building as recommended in this Standard.

6.3 The timber-frame to which the boards are fixed must be structurally sound and constructed in accordance with the requirements of the relevant national Building Regulations and Standards.

6.4 The timber-frame structure supporting BAL Board AP and BAL Render Board must be able to take the full wind actions and be capable of sustaining the weight of the boards. The adequacy of the structural frame is outside the scope of this Certificate and must be verified by a suitably qualified and experienced individual.

6.5 The wall diaphragms must be designed to resist both horizontal and vertical imposed loads in accordance with clause 9.2.4 of BS EN 1995-1-1 : 2004.

6.6 From test data in accordance with BS EN 594 : 2011, wall constructions consisting of 6.5 and 9.0 mm thick BAL Board AP (with 2 mm gap between boards) fixed to 38 by 89 mm grade C16 timber studs at 600 mm maximum centres, with 2.9 mm diameter by 50 mm long nails (19 and 10 mm edge distance to perimeter and internal studs respectively) at 150 mm centres to perimeter studs and 300 mm centres to internal studs were found to achieve the characteristic racking strengths shown in Table 3.

*Table 3 Characteristic racking strength from test<sup>(1)</sup> (kN·m<sup>-1</sup>)*

	6.5 mm BAL Board AP		9.0 mm BAL Board AP	
Load per stud (kN)	0	5	0	5
Characteristic racking strength (kN·m <sup>-1</sup> )	2.20	3.12	3.15	4.16

(1) Design racking strengths must be calculated by applying the appropriate modification factor  $k_{mod}$  and partial factor for material properties  $\gamma_m$  to the characteristic racking strength in accordance with BS EN 1995-1-1 : 2004.

6.7 Tests carried out confirm that the bond strength between the three basecoats and BAL Render Board is higher than  $0.08 \text{ N·mm}^{-2}$  in accordance with the requirements of ETAG 004 : 2013.

6.8 The characteristic pull-through resistance of the 4.8 by 42 mm self-drilling screws (BMDW4842) through the boards were calculated from pull-through failure values determined by tests and are given in Table 4.

**Table 4 Characteristic pull-through resistance (kN)**

BAL Board thickness (mm)				BAL Render Board thickness (mm)	
Dry		Exposed to wetting			
9	12	9	12	9	12
0.345	0.500	0.211	0.371	0.373	0.530

6.9 The characteristic pull-out resistance of the 4.8 by 42 mm self-drilling screws (BMDW4842) from grade C16 timber with an embedment length of 30 mm, was calculated from pull-out failure values determined by tests and found to be 0.383 kN.

#### Impact resistance — BAL Render Board

6.10 When tested<sup>(1)</sup> for hard body impacts of 3 and 10 Joules of energy in accordance with ETAG 004 : 2013, the system comprising a 9 mm thick BAL Render Board, with the two render systems specified in Table 2 of this Certificate, supported on timber battens at 600 mm centres maximum, achieved adequate resistance to impact. Therefore, the 9 and 12 mm BAL Render Board coated with the render systems specified in Table 2 and installed with timber battens at 600 mm centres maximum, are suitable for use in external walls in Category I, II, III and IV<sup>(2)</sup>.

6.11 When tested<sup>(1)</sup> for soft body impact in accordance with MOAT 43 : 1987, the BAL Render Board system, with 9 mm BAL Render Board supported on battens at 600 mm centres maximum, and with the render systems specified in Table 2, achieved adequate resistance to soft body impact. Therefore, both the 9 and 12 mm BAL Render Board are suitable for use in the BAL Render Board system as described, in external walls in Category E<sub>2</sub>, E<sub>3</sub> and E<sub>4</sub><sup>(3)</sup>.

#### Impact resistance — BAL Board

6.12 When tested<sup>(1)</sup> for hard body impacts of 3 and 10 Joules of energy in accordance with ETAG 004 : 2013, the 9 and 12 mm BAL Board supported on battens at 450 mm maximum centres, achieved adequate resistance. BAL Board (9 and 12 mm) is therefore suitable for use as a wall liner in areas requiring impact resistance in Category I, II, III and IV<sup>(2)</sup>.

6.13 When tested<sup>(1)</sup> for soft body impact in accordance with ISO 7892 : 1988, the 9 and 12 mm BAL Board supported on battens at 450 mm centres maximum, achieved adequate resistance to soft body impact and is therefore suitable for use in external walls in Category E<sub>2</sub>, E<sub>3</sub> and E<sub>4</sub><sup>(3)</sup> and internal walls in Category I<sub>2</sub> and I<sub>3</sub><sup>(3)</sup>.

(1) Results only valid for described construction.

(2) The use categories are defined in ETAG 034 : 2012 Part 1 as:

- Use 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
- 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
- Use category III — a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects
- Use category IV — a zone out of reach from ground level.

(3) The use categories are defined in MOAT 43 : 1987 as:

- Use category E<sub>2</sub> — a zone readily accessible to the public and others with little incentive to exercise care but not in vandal prone locations
- Use category E<sub>3</sub> — a zone accessible primarily to those with some incentive to exercise care. Some chance of accident occurring or of misuse
- Use category E<sub>4</sub> — a zone only accessible, but not near a common route, to those with high incentive to exercise care. Small chance of accident occurring or of misuse
- Use category I<sub>2</sub> — a zone readily accessible to public and others with little incentive to exercise care. Some chance of accident occurring or of misuse
- Use category I<sub>3</sub> — a zone accessible primarily to those with some incentive to exercise care. Some chance of accident.

## 7 Behaviour in relation to fire

#### BAL Board and BAL Board AP



7.1 Where BAL Board and BAL Board AP are incorporated in a wall construction which is subject to fire resistance requirements, an appropriate assessment or test must be carried out by a United Kingdom Accreditation Service (UKAS) accredited laboratory for the test concerned.



7.2 When tested in accordance with BS EN 13501-1 : 2007 BAL Board, BAL Board AP and BAL Render Board achieved a reaction to fire classification of A1.

7.3 The results of fire resistance partition wall constructions tested in accordance with BS EN 1364-1 : 1999 are given in Table 5 of this Certificate.

Table 5 Fire resistance duration

Construction	Duration (minutes)	Test Standard
Partition wall comprising (from the unexposed face) one layer 9 mm thick BAL Board AP, 38 by 138 mm C16 grade softwood timber studs, 140 mm thick Knauf Ecos insulation, one layer 9 mm thick BAL Board AP, 45 by 45 mm treated vertical timber battens at 600 mm centres and one layer 12.5 mm thick British Gypsum Gyproc fireline plasterboard	90	BS 476-21 : 1987
One layer of 12 mm BAL Board AP fixed either side of a vertical 70 x 36 mm by 1 mm thick galvanized mild steel studs with 6 mm magnesium oxide board strip with a cavity filled with two 30 mm thick Rocksilk Universal Slab RS45 rock mineral wool insulation	68	BS EN 1364-1 : 1999 (non load-bearing)
One layer of 12 mm thick BAL Board AP screw fixed to either side of a timber-frame consisting of 60 by 48 mm grade C16 softwood timber studs at 600 mm centres, with softwood timber noggins between studs behind horizontal joints between the BAL Board AP. Cavity filled with two layers of Rocksilk Universal Slab RS45 rock mineral wall insulation	132	BS EN 1364-1 : 1999 (non load-bearing)



7.4 The boards may be regarded as having a Class 'O' surface (in England, Wales and Northern Ireland) or 'low risk' material (in Scotland) in accordance with the national Building Regulations:

**England and Wales** — Approved Document B

**Scotland** — Technical Standard 2.5

- (1) Technical Handbook (Domestic).
- (2) Technical Handbook (Non-Domestic).

**Northern Ireland** — Technical Booklet E.

7.5 Cavity barriers should be incorporated as required under the national Building Regulations, but should not block essential ventilation and drainage pathways. Guidance on fire barriers can be found in BRE Report BR 135 : 2003.

### BAL Render Board



7.6 The reaction to fire classification for the BAL Render Board system finished with the K Rend render system is B-s2, d0 in accordance with BS EN 13501-1 : 2007.

7.7 The reaction to fire classification for the BAL Render Board system finished with the Alsecco render system is B-s1, d0 in accordance with BS EN 13501-1 : 2007.

7.8 The system is restricted for use in buildings with a maximum storey height of less than 18 m above ground.

## 8 Weathertightness

8.1 The BAL Render Board as described in section 1.3 will resist the passage of moisture from weather. Any water collecting in the cavity due to rain or condensation will be removed by drainage and ventilation.

8.2 External walls incorporating the boards must have suitable weather protection on the outside and a vented cavity. Any water collecting in the cavity due to rain or condensation must be able to be drained through openings at the base of each closed section of cavity. The product should be treated as conventional sheathing board with regard to detailing



and damp-proofing at openings, eaves and sole plate, and the fixing of wall ties. Where required by design, the addition of a breather membrane must be in accordance with BS 5250 : 2011.

## 9 Water absorption



The water absorption of BAL Render Board with the Alsecco and K Rend render systems is acceptable in accordance with the requirements of ETAG 004 : 2013.

## 10 Condensation risk

10.1 When using the BAL Render Board system, consideration must be given to the overall wall design using the recommendations of BS 5250 : 2011 to minimise the risk of condensation.

10.2 As the BAL Render Board system incorporates a 25 mm clear ventilated cavity between the back of BAL Render Board and the substrate wall, the risk of interstitial condensation within the system is reduced.

10.3 The water vapour resistivity for BAL Board, BAL Board AP and BAL Render Board is 222, 422 and 422 MN·s·g<sup>-1</sup> respectively.

## 11 Mould resistance

Results of tests indicate that the boards are resistant to mould growth.

## 12 Maintenance

### Boards

12.1 As the boards have suitable durability and in most cases will be covered with finishes, maintenance is not required.

12.2 Under normal conditions of use the boards are unlikely to suffer damage, but if damage does occur, the boards must be replaced.

### BAL Render Board system

12.3 Periodic inspections are recommended to assess the need for cleaning, localised repairs and element replacements, such as joints seals and fixings, to ensure that ingress of water does not occur. Necessary repairs should be carried out immediately (see section 12.2).

12.4 Damaged areas must be repaired using appropriate materials and advice should be sought from the Certificate holder.

## 13 Durability

### BAL Board and BAL Board AP



13.1 The boards are durable materials and should have a life equal to that of the structure in which they are installed.

## BAL Render Board system



13.2 The durability and service life of the BAL Render Board system will depend on the building location, immediate environment and intended use of the building, and proper maintenance and repairs.

13.3 Provided regular maintenance is carried out, as described in section 12 and in accordance with the Certificate holder's instructions, the BAL Render Board system can be expected to have a service life in excess of 30 years when used in the normal climatic conditions found in the UK.

13.4 Care should be taken when designing, detailing and constructing buildings to ensure that moisture does not accumulate within the board.

## Installation

### 14 General

14.1 The level of supervision during installation of BAL Board, BAL Board AP and BAL Render Board and the associated structure, must be sufficient to ensure the quality of workmanship.

14.2 Framing grade timber studs or galvanized steel framework should be provided at a maximum 600 mm centres.

14.3 The frame to which the panels are fixed must be structurally sound and constructed in accordance with the requirements of the relevant national Building Regulations and Standards.

14.4 The boards can be scored using a utility knife and snapped. Suitable dust control measures must be taken (eg protective safety glasses and respiratory masks) observing all necessary health and safety regulations. Damaged boards must not be used. The boards must be stored, handled and used in accordance with this Certificate and the Certificate holder's installation and health and safety instructions.

#### BAL Render Board

14.5 Horizontal movement joints in accordance with BS EN 13914-1 : 2005 must be provided at every floor to accommodate vertical shrinkage of up to 6 mm in the timber-frame and to follow movement joints in the substructure.

14.6 Vertical movement joints in accordance with BS EN 13914-1 : 2005 should be provided at a maximum of 15 m intervals. The actual spacing and position of the joints will be determined by the shape of the area to be rendered and should coincide with movement joints in the structure and allow for the same degree of movement.

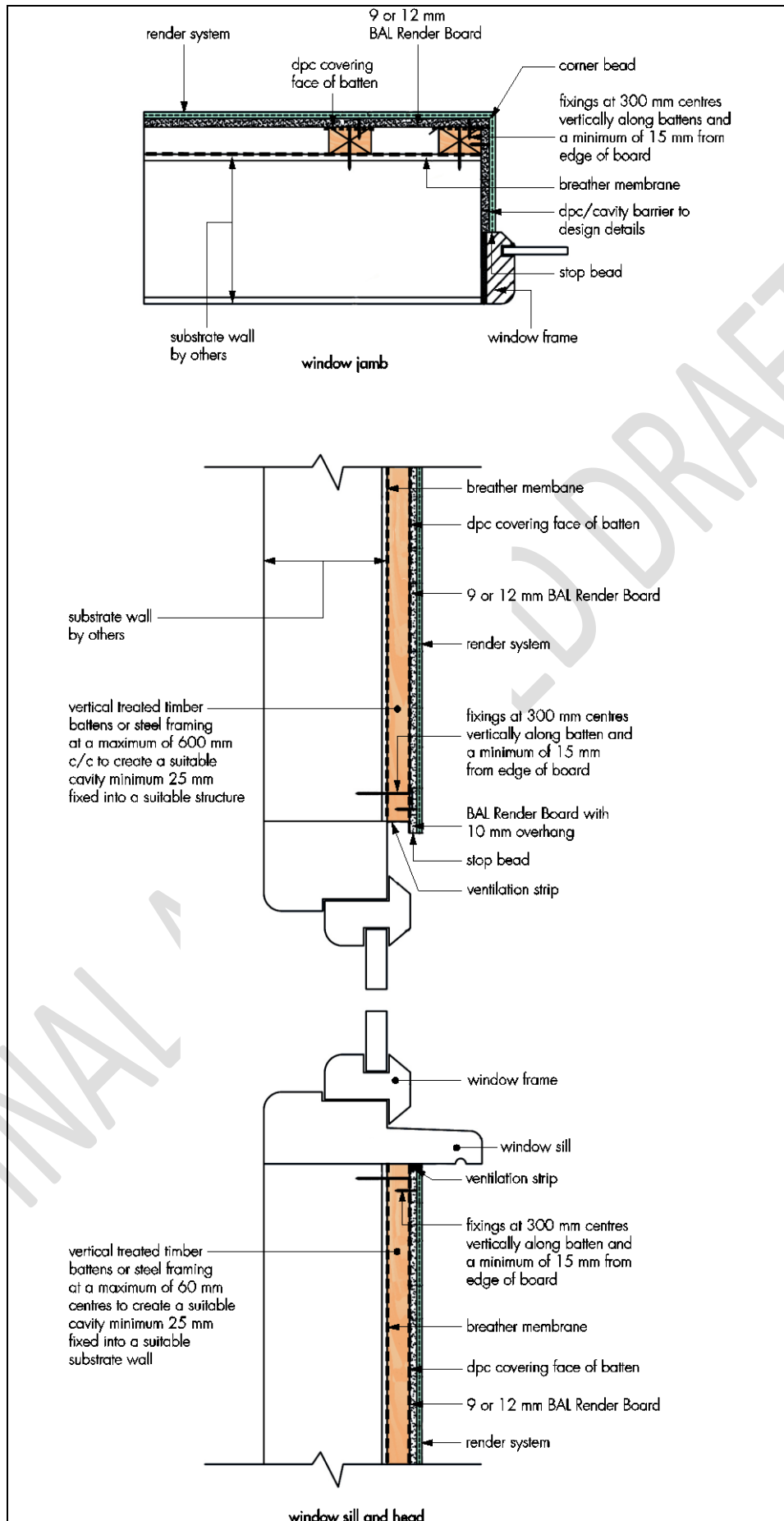
14.7 The system should be used above damp-proof course level and a minimum of 150 mm above ground level.

### 15 Procedure

15.1 Boards are attached to the vertical frame with screws at nominal spacings of 40 mm from the board top edge and 15 mm from side edge spaced at nominal spacings of 300 mm centres vertically and at a maximum 600 mm horizontally. The screws must not be over-tightened. Fixing should start from the centre working outwards to avoid distortion within the board.

15.2 For BAL Board and BAL Board AP, a 6 mm gap is left between the floor and first board. If necessary, a 4 mm gap can be left between boards if there is a possibility of movement in the structure or building. Boards are installed staggered to avoid four corners meeting at one point.

Figure 2 Opening details — Timber-frame



15.3 For BAL Render Board, the following installation procedures should be followed:

- a minimum 4 mm gap should be left between and all around the boards. Anticipated movement in the timber-frame structure should be allowed for and mirrored when fitting BAL Render Board
- prior to the basecoat, a bead of silicone must be applied around all window and door frames or where the render abuts any other building or surface in accordance with the Certificate holder's installation instructions to ensure that they are weathertight
- the basecoat is prepared by thoroughly mixing the contents with the appropriate amount of clean water following the manufacturer's instructions until the correct workability is achieved.
- the basecoat is trowelled onto the surface of BAL Render Board to a thickness of between 4 and 5 mm ensuring it is butted against details (eg under window sills), and trowelled smooth. The surface is roughened with a notched trowel
- the drying period of any render will depend on weather conditions; however, the basecoat must be left to harden as recommended by the manufacture before applying the relevant finish
- mesh reinforcement is placed onto the roughened surface of the basecoat, which is then trowelled over to completely cover the mesh. All the rendered surfaces must be reinforced and joints in the mesh must overlap by at least 100 mm
- additional mesh is required around openings and at corners in accordance with the render supplier's installation instructions
- all window and door openings are sealed in accordance with the Certificate holder's installation instructions to ensure that they are weathertight (see Figure 2).

15.4 Where boards are installed over areas with fixtures and fittings, cut-outs should be carried out before installation.

## Technical Investigations

### 16 Tests

Tests were conducted on the boards and the results assessed to determine:

- water absorption
- bending strength
- flexural strength/modulus of rupture
- density
- reaction to fire
- resistance to fire
- water impermeability
- hard and soft body impact
- resistance to organic growth
- dimensional changes
- durability
- racking resistance
- thermal conductivity
- tensile strength
- pull-out/pull-through strength of fixings
- bond strength, after ageing, between the BAL Render Board and specified render systems.

### 17 Investigations

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

## Bibliography

BS 476-21 : 1987 *Fire tests on building materials and structures — Methods for determination of the fire resistance of loadbearing elements of construction*

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

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

BS EN 594 : 2011 *Timber structures — Test methods — Racking strength and stiffness of timber frame wall panels*

BS EN 1364-1 : 1999 *Fire resistance tests for ton-loadbearing elements — Walls*

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

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

BS EN 12467 : 2012 + A1 : 2016 *Fibre-cement flat sheets — Product specification and test methods*

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

BS EN 13914-1 : 2005 *Design, preparation and application of external rendering and internal plastering — External rendering*

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

ETAG 004 : 2013 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems with Rendering*

ETAG 034 : 2012 *Guideline for European Technical Approval of Kits for External Wall Claddings — Part 1 — Ventilated Cladding Kits Comprising Cladding Components and Associated Fixings*

ISO 7892 :1988 *Vertical building elements — Impact resistance tests — Impact bodies and general test procedures*

MOAT 43 : 1987 *UEAtc directives for impact testing opaque vertical building components*

BRE Report BR 135 : 2003 *Fire Performance of External Insulation For Walls of Multi-Storey Buildings*

### 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 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.