



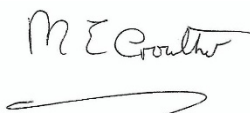


<b>Number</b> BAW 18-086/01/A	 	<b>Categories</b> External Walls, Cladding, Internal Walls and Ceilings
<b>Replaces:</b> -		<b>Phase</b> Assessment
<b>Date</b> September 2019		<b>Subject</b> Self-supporting Composite Lightweight Panels
<b>Project number</b> 17-C-0129 / 2288		
<b>Validity</b> www.kiwa.co.uk/bda	<b>BDA Agrément® BAW 18-086/01/A</b>	
<b>Product</b> <b>Agrément holder</b>	<b>Magply MgO Sulphate Board</b>  IPP Ltd. Bradwell Hall, Bradwell on Sea Southminster, Essex CM0 7HX, UK T: +44 1621 776252 E : sales@magply.co.uk W: www.magply.co.uk	
<b>Description</b>	Magply MgO Sulphate Board, hereafter the Product, is a self-supporting composite lightweight MgO Board of 9 mm and 12 mm thickness.	
<b>Scope (use)</b>	The Product is intended to be used in self-supporting composite lightweight panels and spandrel panels for external and internal walls, cladding and ceilings. The panels can contribute to the loadbearing capacity of the works. The panels always require external finishing layers to provide waterproofing.	
<b>Objective</b>	This document provides independent information to specifiers, building control personnel, contractors, installers and other construction industry professionals considering the fitness for the intended use of the Product.	
<b>Summary of Agrément</b>	This Agrément covers the following: <ul style="list-style-type: none"><li>• Conditions of use;</li><li>• Sources, including relevant codes of practice and test reports;</li><li>• Independently verified product characteristics;</li><li>• Quality control and continuous surveillance;</li><li>• Points of attention for the specifier and examples of details;</li><li>• Installation aspects;</li><li>• Compliance with national Building Regulations and non-Regulatory Standards.</li></ul>	
<b>Major points of assessment</b>	<b>Structural performance (sections 3 &amp; 7.5)</b> When fully installed in the building structure in accordance with this Agrément the Product can contribute to adequate strength and stiffness to resist the wind and imposed loads likely to be experienced in the UK.  <b>Safety in case of fire (sections 3 &amp; 7.4)</b> Reaction to fire - the Product is classified as Euroclass A1 (Non-Combustible) in accordance with BS EN 13501-1.  Fire resistance - subject to the final project specific design, the Product can satisfy all the provisions of the national Building Regulations for (external) fire performance, without the need for further testing.  <b>Durability and maintenance (section 7.7)</b> The dimensional stability of the Product panels is extremely good; the durability of the complete external wall system will depend upon the external finishing, the environment, use and maintenance of it. The conditions for attack by biological agents of the Product panels are to be regarded as hazard class 1 according to BS EN 335-1:2006, which means that no treatment of such components is necessary and the Product will remain for the life of the building in which it is installed. The Product has a low swell, does not show crying/sweating and does not require maintenance.	
<b>Statement</b>	It is the opinion of the Kiwa Ltd. that the Product is fit for its intended use, provided it is specified and installed in accordance with this Agrément.    Chris Vurley, CEng Technical Manager, Building Products Mark Crowther, M.A. (Oxon) Technical Director	
<b>Version</b> 01	<b>Kiwa Ltd.</b>  Unit 5 Prime Park Way, Prime Enterprise Park Derby, DE1 3QB, United Kingdom +44 (0)1332 383333 © 2019 Kiwa Ltd.	Page 1 of 11 pages

<p><b>1 Conditions of use</b></p>	<p><b>1 Application</b> The Product is intended to be used in self-supporting composite lightweight panels and spandrel panels for external and internal walls, and ceilings. The panels can contribute to the loadbearing capacity of the works. The panels always require external finishing layers to provide waterproofing.</p> <p><b>2 Assessment</b> Kiwa Ltd. has assessed the Product according to ETAG 016:2003, Part 1, Part 3 and Part 4, the results are given in section 3 of this Agrément; Kiwa BDA Expert Centre Building Envelope (ECBE) has assessed all aspects related to the specifications, installation aspects, Technical Assessment Visits and Building Regulations. Factory Production Control has been assessed. <i>*) CPR Notified Laboratory No. NB 1640; Testing Accreditation RvA L 447 (acknowledged by UKAS)</i></p> <p><b>3 Installation</b> The Product shall only be installed by (sub)contractors whose employees are experienced, in accordance with current good building practice, the instructions of the Agrément holder and the requirements of this Agrément.</p> <p><b>4 Geographical scope</b> The validity of this document is limited to England, Wales, Scotland, Northern Ireland and Ireland, with due regard to section 10 of this Agrément (Building Regulations).</p> <p><b>5 Validity</b> The purpose of this BDA Agrément® is to provide for well-founded confidence to apply the Product in the described applications and according to approved specifications. According to the BDA Guideline – BDA Agrément® the validity of this document is three years after the official date of issue, published on <a href="http://www.kiwa.co.uk/bda">www.kiwa.co.uk/bda</a>. After this the validity can be extended every three years following a positive review. This Agrément is not valid in those cases where ECBE identifies that the design of the application does not comply with article 7.1. Permitted constructions.</p>		
<p><b>2 Sources</b></p>	<ol style="list-style-type: none"> <li>ETAG 016:2003, Part 1: General, Part 3: Specific aspects relating to self-supporting composite lightweight panels for use in external walls and cladding, Part 4: Specific aspects relating to self-supporting composite lightweight panels for use in internal walls and ceilings, used as European Assessment Document (EAD)</li> <li>ETA 17/0976 Magply MgO Sulphate Board, 2017-12-27</li> <li>Kiwa Ltd. Report of Inspection of Factory and Factory Production Control, Kiwa Ltd., 22-08-2018</li> <li>BS EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests</li> <li>BS EN ISO 12572:2016 Hygrothermal performance of building materials and products. Determination of water vapour transmission properties. Cup method</li> <li>BS EN 1604:2013 Thermal insulating products for building applications. Determination of dimensional stability under specified temperature and humidity conditions</li> <li>EOTA TR 001:2003 Determination of impact resistance of panels and panel assemblies, § 2 – Test method for determining soft body impact resistance</li> <li>EOTA TR 001:2003 Determination of impact resistance of panels and panel assemblies, § 3 – Test method for determining hard body impact resistance</li> <li>BS EN ISO 10140-2:2010 Acoustics. Laboratory measurement of sound insulation of building elements. Measurement of airborne sound insulation</li> <li>BS EN 335-1:2013 Durability of wood and wood-based products. Use classes: definitions, application to solid wood and wood-based products</li> <li>SRL Technical Services Limited Test Report No: C/23770/T01 The Laboratory Measurement of Airborne Sound Insulation of Magply Boards, 2017-06-22</li> <li>BS EN ISO 717-1:2013 Acoustics. Rating of sound insulation in buildings and of building elements</li> <li>Lucideon Test Report 153788 Determination of Racking Resistance in Accordance with BS EN 594:2011, 2018-05-09</li> <li>BS EN 594:2011 Timber structures. Test methods. Racking strength and stiffness of timber frame wall panels</li> <li>Exova WF Report WF 355911&amp;355912 Class 0 Summary Report, 2016-01-21</li> <li>Exova WF Report WF 366624 Magply Classification of Reaction to Fire Performance in accordance with BS EN 13501-1:2007+A1:2009, 2016-06-14</li> <li>Kiwa BDA Test report Magply MgO Sulphate Board 0267-C-17/1 Determination of product characteristics, 2017-10-03</li> <li>Kiwa BDA Report Calculations Magply MgO Sulphate Board, 2017-11-24</li> <li>ETAG 006:2013 Systems of Mechanically Fastened Flexible Roof Waterproofing Membranes</li> </ol>		
<p><b>Version</b> 01</p>	<table> <tr> <td data-bbox="359 2078 1270 2181"> <p><b>Kiwa Building Products</b> © 2019 Kiwa Ltd.</p> </td><td data-bbox="1270 2078 1437 2181"> <p>Page 2 of 11 pages</p> </td></tr> </table>	<p><b>Kiwa Building Products</b> © 2019 Kiwa Ltd.</p>	<p>Page 2 of 11 pages</p>
<p><b>Kiwa Building Products</b> © 2019 Kiwa Ltd.</p>	<p>Page 2 of 11 pages</p>		

**3 Independently assessed Product characteristics used for critical functions\*\*)**

- 20 BS 5268-6.1:1996 Structural use of timber. Code of practice for timber frame walls. Dwellings not exceeding seven storeys
- 21 BS EN 1995-1-1:2004+A2:2014 Eurocode 5: Design of timber structures. General. Common rules and rules for buildings
- 22 Magply Data sheets 9 mm and 12 mm
- 23 Magply FR Intumescent Sealant data sheet
- 24 DoP No.02/2017 Magply FR Intumescent Sealant data sheet, 2017-02-02
- 25 Exova WF Report WF 349368 Fire Testing Resistance of Asymmetrical, Loadbearing Wall Assembly, tested to BS EN 1365-1:2012, 2016-10-19
- 26 BS EN 1365-1:2012 Fire resistance tests for loadbearing elements. Walls
- 27 Builddesk, Conversion of Vapour Resistances and  $\mu$ -Values to BS 5250:2002 Annex E
- 28 Kiwa BDA Testing, Test Report no. 0218-K-19/1: Magply MgO board – behaviour at increased temperature and relative humidity, 2019-07-10.

\*\*\*)The critical functions which apply to this section are structure, fire resistance and durability.

**Magply MgO Sulphate Board**

**Description and identification properties**

- The Product is intended to be used in a self- supporting composite lightweight MgO board panels for external and internal walls and ceilings. The panels can contribute to the loadbearing capacity of the works. The panels always require external finishing layers to provide waterproofing.  
The Product sizes and weights are given in Table 1.

*Table 1 – Board sizes and weights*

Thickness (mm)	Width (mm)	Length (mm)	Weight (kg.m <sup>-2</sup> )	Weight per Board (kg)	Surface (m <sup>2</sup> )
9	1200	2400	9.94	28	2.88
		2700		32	3.24
		3050		36.4	3.66
		2440		29	2.98
12	1200	800	13.19	13	0.96
		2400		38	2.88

- water vapour diffusion resistance EN ISO 12572 : 0.31 MNs.g<sup>-1</sup>
- water vapour diffusion resistance factor,  $\mu$ -value, calculated : 7 -
- water vapour diffusion resistance,  $s_D$ , calculated : 0.06 m

**Safety in case of fire**

• **Reaction to fire**

The Product is classified as Euroclass A1 (Non-Combustible) in accordance with BS EN 13501-1.

• **Fire resistance**

The following loadbearing Product panel assembly has been tested according to BS EN 1365-1: overall dimensions of 2400 mm high by 3000 mm wide by 107 mm thick. The assembly is made of a C16 grade softwood timber framework with top and bottom rails and 9 studs. Almost all studs are spaced 400 mm apart and have a nominal size of 90 mm x 38 mm. On both sides of the studs a single layer of the 9 mm thick Product is fixed with 45 mm x 3.2 mm steel screws at 150 mm centres. The voids between the timber studs are filled with 100 mm thick glass mineral slabs with a density of 17.8 kg/m<sup>3</sup>. A total, vertical load of 57.6 kN was applied via hydraulic rams. The test results are given in Table 2.

**3 Independently assessed Product characteristics used for critical functions\*\*)**  
(continued)

*Table 2 – Test results of fire resistance under loaded conditions to BS EN 1365-1*

Aspect		Duration (minutes)
Loadbearing capacity		67*
Integrity performance	Sustained flaming	67
	Gap gauge	67*
	Cotton pad	67
Insulation performance		67

*\*The test duration: the test was discontinued after 67 minutes*

**Dimensional stability**

- The dimensional stability of the 9 mm and 12 mm panels has been determined according to BS EN 1604. The results are given in Table 3.

*Table 3 – Mean dimensional changes after 48 h at 90% RH*

Thickness (mm)	Mean dimensional change (%L/L)		
	Length	Width	Thickness
9	0	0	0
12	+0.1	+0.2	+0.7

**Structural performance**

• **Mechanical resistance to wind suction loads**

The resistance of the Product panels on its supports, subjected to negative loads (wind suction loads) is limited by the pull through resistance of the panel, i.e. the local resistance of the panel around the fixings. The determination of the axial failure of a fastener under static loading, irrespective of the failure mode, has been performed according to ETAG 006, annex D.2.1: Axial loading test. The tests were performed with Easy Drive Drywall Screws 3,5 x 45 mm on 9 mm and 12 mm Product panels. The results are given in Table 4.

*Table 4 – Axial loading tests results*

Thickness (mm)	Axial load (N)			
	Mean value	Standard deviation s	5% fractal	Failure mode
9	<b>1393</b>	103	1195	pull through
12	<b>1663</b>	129	1415	pull through

On the basis of these results calculations have been made to determine the safe negative loads for different spans and thicknesses. The results are given in Table 5.

*Table 5 – Safe loads for the vertical application of the Product for different spans and thicknesses*

Span support beams (m)	Max. admissible wind load (kPa)	
	9 mm	12 mm
0.4	3.29*	7.30*
0.5	2.10*	4.60*
0.6	1.46	3.20*
0.7	1.07	2.40
0.8	0.82	1.80

*\*Unlikely to happen*

**3 Independently assessed Product characteristics used for critical functions\*\*)**  
(continued)

Also on the basis of the axial loading tests results as given in Table 3, calculations have been made to determine the required minimum number of fasteners to fix the Product panels, depending on the negative loads. The results are given in Table 6.

*Table 6 – Required minimum number of fasteners to fix the Product panels*

Span (m)	Wind load (kPa)					
	-5	-4	-3	-2	-1	-0.5
	Number of fasteners per m <sup>1</sup>					
0.3	4	4*	4*	4*	4*	4*
0.4	4.4	4	4*	4*	4*	4*
0.5	5.5	4.5	4	4*	4*	4*
0.6	6.6	5.3	4	4*	4*	4*

*\*Practical minimum*

- Resistance to impact for soft body**

The determination of soft body impact resistance has been performed according to EOTA TR 001 § 2. The Product panels, thickness 9 mm, have been installed on a 140 mm × 44 mm stud partition wall with studs 600 mm centres and no vertical noggins. The height has been 2400 mm, fastened with standard drywall screws at 150 mm centres. The results are given in Table 7.

*Table 7 – Results soft body impact test on 9 mm thick panels*

Damage	Total impact energy (Nm)	
	200	300
Collapse	No	No
Penetration	No	No
Projection	No	Yes

- Resistance to impact for hard body**

The determination of hard body impact resistance has been performed according to EOTA TR 001 § 3. The hard body impactor used has been a steel ball, with a diameter of 63.5 mm, with a mass of 1030 g (1.0 kg steel ball). The boards have been installed on a support of timber beams with a free span of 600 mm. The applied total impact energy has been 10.0 Nm. The results are given in Table 8.

*Table 8 - Results hard body impact tests on 9 mm and 12 mm thick Product panels*

Damage	Thickness of the panel (mm)	
	9	12
Collapse	No	No
Penetration	No	No
Projection	No	No

**3 Independently assessed Product characteristics used for critical functions\*\*)**  
(continued)

- Racking resistance**  
 The determination of the racking resistance has been performed according to BS EN 594. The racking strength and stiffness of the panel were determined according to Section 6.5 of BS EN 5268. Each timber frame panel was of overall size 2400 mm x 2400 mm and comprised 38 mm x 89 mm C16 studs at nominally 600 mm centres, together with a single bottom rail single top rail. A head binder was used above the top rail but not fixed to the sheathing. The studs were fixed to the top and bottom rail using 2 x 3.1 mm x 90 mm long ring shank nails per stud, at the base and top rails. 1200 mm x 2400 mm x 9 mm thick Product boards were nailed to the face of the timber frame at 50 mm centres to the perimeter and 150 mm centres to the internal studs, using 2.9 mm x 50 mm smooth nails.  
 In accordance with Figure 3 of BS EN 594, linear voltage displacement transducers (LVDT's) were fixed in place so as to record horizontal deflection at the head of the panel (Displacement 1), at the base of the panel (Displacement 2) and to measure any uplift at the base of the panel (Displacement 3). The results are given in Table 9.

*Table 9 - Summary of racking loads for timber frame panels tested with 9 mm Product boards fixed at 50 mm centres to the perimeter and 150 mm to the internal studs*

Panel	Racking Stiffness (N•mm)	Test Racking stiffness Load (N•mm)	F Max (kN)	Calculated Racking Strength (kN)	Calculated Basic Test Racking Resistance to BS 5268-6.1 (kN•m)	Tabulated Basic Test Racking Resistance to BS 5268-6.1 (kN•m)	Mode of Failure
1	2541	14180	25.67	14.92	5.90 <sup>1</sup>	1.68	Withdrawal of leading stud with splitting of base rail and failure of sheathing board at base rail-fixings pulling through.
1	2541	12197	25.67	12.84	5.08 <sup>2</sup>	1.68	

**Note 1:** Value has been calculated using a k109 modification factor of 0.93 assuming 3 No. tests have been carried out.

**Note 2:** Value has been calculated using a k109 modification factor of 0.80 based on 1 No. test having been carried out.

**Protection against noise**

- Direct airborne sound insulation**  
 Tests have been done to determine the sound reduction index of the Product in accordance with BS EN ISO 10140-2. The results are given in Table 10, expressed as a single-number rating  $R_w$  in accordance with BS EN ISO 717-1.

*Table 10 – Results direct airborne sound insulation tests on 9 mm and 12 mm thick Product panels*

Thickness (mm)	$R_w$ (C;C <sub>tr</sub> ) (dB)
9	28 (-1;-2)
12	29 (-2;-2)

- Sound absorption**  
 The sound absorption of the Product panels has not been determined, since this is ruled by the finishing, which is not applied in the factory and does not form part of the Product.

**Fire retardant sealant**

- Magply FR Intumescent Sealant
  - Reaction to fire : Class D-s1, d1
  - Durability Service : Class Z<sub>2</sub>
  - CE mark - Sealant for fire rated joints and penetrations : Class EI 240

**4 Factory Production Control (FPC)**

Kiwa Ltd. has determined that IPP Ltd., with respect to the Product fulfills all provisions concerning the specifications described in this Agrément. The FPC audit conducted on the 22-08-2018 demonstrated that IPP Ltd. have a satisfactory Quality Management System and are committed to operating an effective Quality Plan throughout their activities.

5 Quality Management System	IPP Ltd. have an effective Quality Plan in operation. The Quality Plan covers all clauses required by the BDA Agrément®. All processes inspected in the factory were well organised and there is sufficient space for conducting all processes including storage of the boards, packaging and transport.	
6 Continuous surveillance	In order to demonstrate that the FPC is in conformity with the requirements of the technical specification described in this Agrément the continuous surveillance, assessment and approval of the FPC will be done in a frequency of not less than once per year by Kiwa Ltd.	
7 Points of attention for the specifier	1 Permitted constructions	– only construction details designed according to the specifications as given in this Agrément and as shown in section 8 or similar are allowed under this Agrément.
	2 General considerations	– the Product shall be installed by a competent contractor or sub-contractor; – the Product is suitable for use as facade backer board, internal lining board on non-loadbearing and loadbearing internal and external walls and ceilings of new or existing buildings; – the Product is specifically adequate to be incorporated in timber-frame constructions to BS EN 1995-1-1; – the Product is not intended to improve weather resistance and shall not be used as an external cladding; – when installations form a void, services can be incorporated behind the dry lining; where the services have a greater depth than the void, the Product can be chased provided the structural integrity is not affected.
	3 Resistance to damage	– the Product is resistant to normal construction site activities, is unaffected by temporary extremes of temperature and humidity and does not require any form of protection.
	4 Safety in case of fire	– the Product is classified as Euroclass A1 (Non-Combustible) of reaction to fire in accordance with BS EN 13501-1; – the results of tests to BS 476:Part 6:1989+A1:2009 and BS 476:Part 7:1997, demonstrate that the Product, as tested, complies with the requirements for Class 0, as defined in paragraph A13(b) of Approved Document B, 'Fire Safety', to the Building Regulations 2000; – the Product panels are considered "deemed to satisfy" all the provisions for (external) fire performance and can meet all the relevant UK requirements, see also section 3.
	5 Structural performance	– the Product has been tested extensively (see section 3); – the Product will contribute to adequate strength and stiffness of external walls, cladding, internal walls and ceilings to sustain the specified loads, provided the structural performance has been validated by a suitably qualified Structural Engineer.
	6 Thermal performance aspects	– the contribution of the Product to the thermal performance of a timber frame construction is limited, the following values can be used for calculations:  coefficient of thermal conductivity λ : 0.19 W.m <sup>-1</sup> .K <sup>-1</sup> U-value for t = 9 mm : 21.30 W.m <sup>-2</sup> .K <sup>-1</sup> t = 12 mm : 15.90 W.m <sup>-2</sup> .K <sup>-1</sup>
	7 Durability and maintenance	– the dimensional stability of the Product panels is extremely good; the durability of the complete external wall system will depend upon the external finishing, the environment, use and maintenance of it; – the boards show no crying/sweating after exposure for 14 days at 30 °C and 90% RH; droplets will not cause metal corrosion or the 'infection' of wood (causing a higher water absorption than normal); – the conditions for attack by biological agents of the Product panels are to be regarded as hazard class 1 according to BS EN 335-1:2006, which means that no treatment of such components is necessary and the Product will remain for the life of the building in which it is installed.
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## 8 Examples of details

Figure 1 – Wall with brick cladding

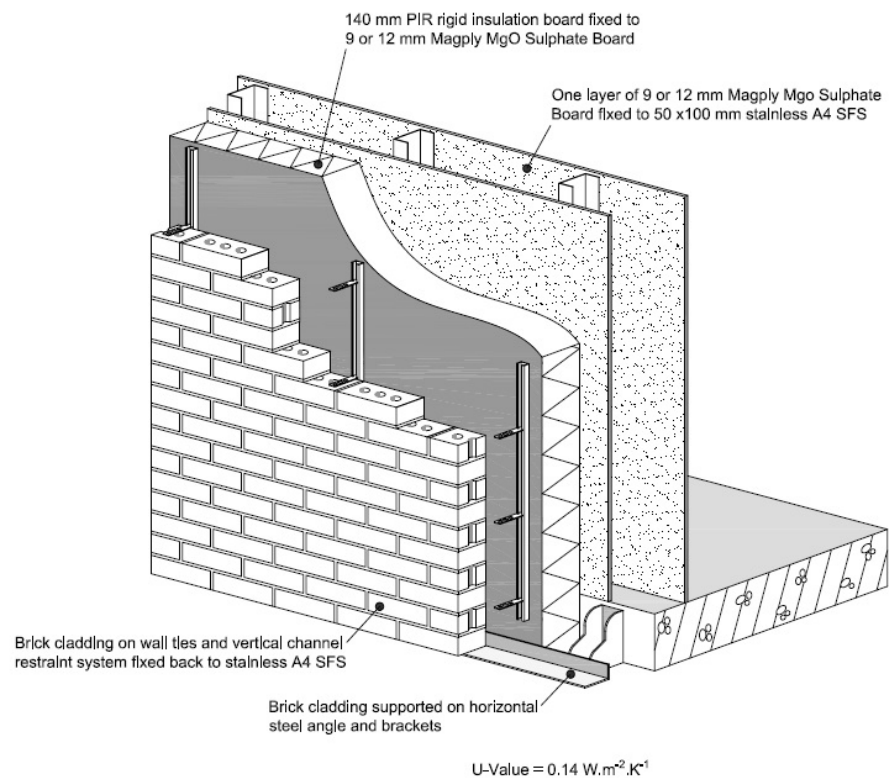
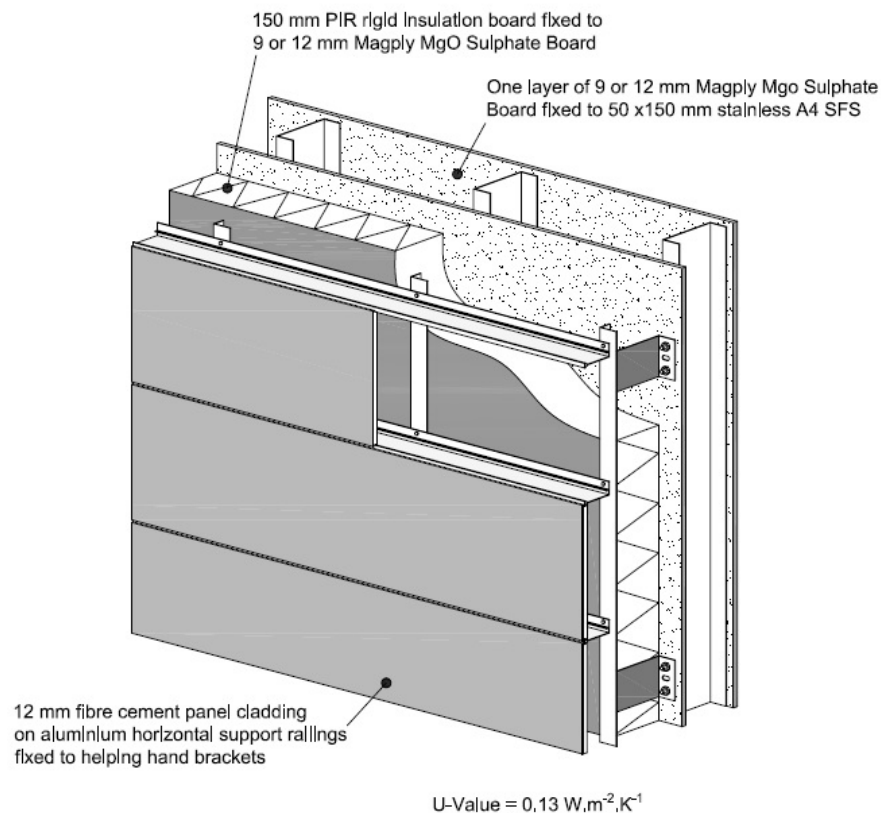


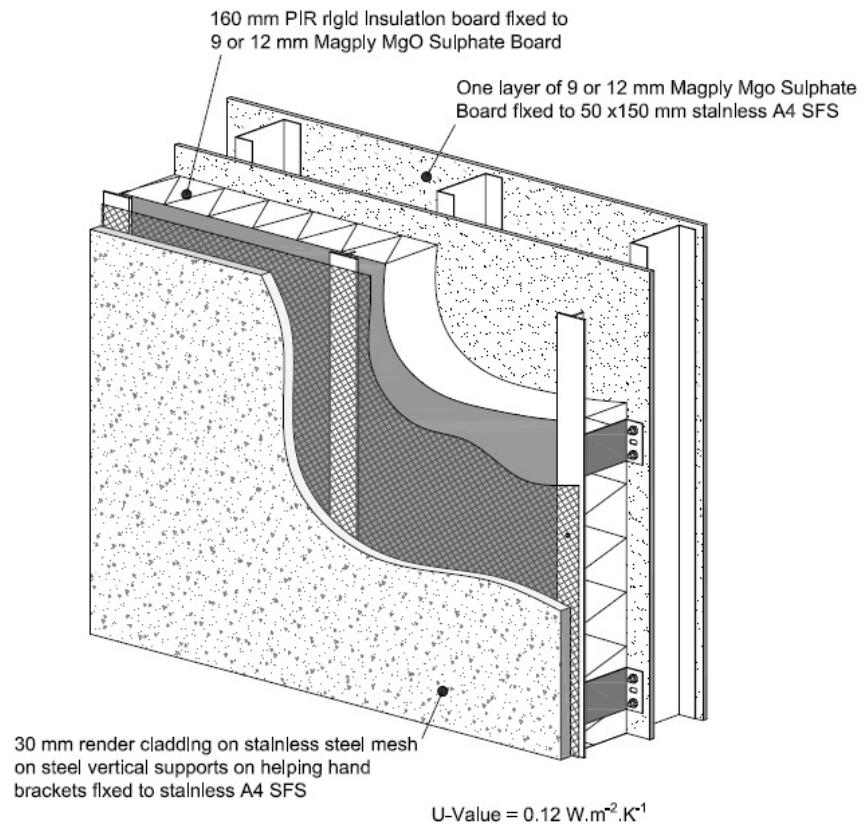
Figure 2 – Wall with panel cladding



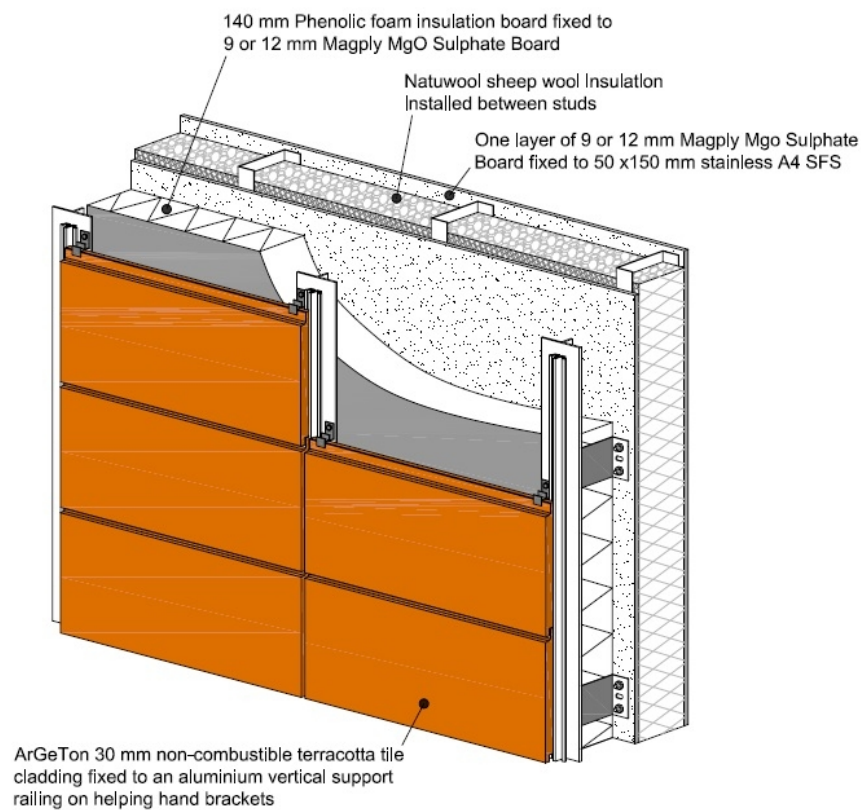


**8 Examples of details**  
(continued)

*Figure 3 – Wall with insulated render*



*Figure 4 – Wall with tile cladding*



## 9 Installation aspects

### 1 General

- the Product shall be installed strictly in accordance with the instructions of the Agrément holder, current good building practice and only by (sub)contractors whose employees are experienced;
- special attention shall be given to the cleaning and preparing of all areas and connections involved before the Product panels or prefabricated timber frame elements made of Product panels are installed.


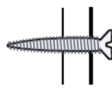
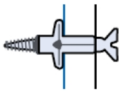
### 2 Delivery and site handling

- the Product boards are either delivered to site in stacks on wooden pallets or in the form of prefabricated timber frame elements on a lorry;
- boards and elements shall be stored flat on a dry, level surface in a well-ventilated area protected from rain and snow.

### 3 Fixings and sealants

- the maximum admissible loads on different hooks and fasteners are given in Table 11.

Table 11 – Maximum admissible loads (kg) on different hooks and fasteners\*

Board Thickness (mm)	Nailed picture hooks			5 mm diameter Continuous thread screw	Toggle bolt
					
9	20	18	5	20	40
12	25	23	10	25	45

\*Maximum loads are subject to fixing quality

- many different loads may be mounted to the Product panels using suitable fixings; lightweight objects can be hung with good quality picture hooks fixed directly into the board;
- loads with a weight of less than 20 kg per fixing point can easily be fixed to the wall with suitable screws, and 40 kg using suitable toggle fixings, without the need for support noggins;
- any two points of attachment must have a minimum distance of 150 mm from each other, otherwise the weight of the load to be supported must be halved. Heavy loads such as sinks, sanitary units, radiators and heavy cabinets should be fixed to the sub layer of the construction or support noggins;
- for fire resistant applications, an intumescent sealant should be used such as Magply FR Intumescent Sealant.

### 4 Limitations

- the Product is not intended to improve weather resistance and shall not be used as an external cladding.

### 5 Maintenance

- as the Product is confined by the building envelope and internal finishing, maintenance is not required, provided that no part of the Product remains permanently exposed, see also article 7.7.

## 10 Building Regulations

### 1 Requirements: The Building Regulations 2010 and subsequent amendments

- A1 Loading – when adequately confined, the Product contributes to satisfying this Requirement, see section 7.5 of this Agrément;
- B2(1) Internal fire spread (linings) - the surfaces of the Product panels exposed from the interior of the building are unrestricted under this Requirement; see sections 3 and 7.4 of this Agrément;
- B4(1) External fire spread – under normal circumstances the external surfaces of the Product panels are unrestricted under this Requirement; see sections 3 and 7.4 of this Agrément;
- Regulation 7 Materials and workmanship – the Product is manufactured from suitably safe and durable materials for its' application and can be installed to give a satisfactory performance, see section 9 of this Agrément.

