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## Agrément Certificate

**09/4633**

Product Sheet 2

### KNAUF CLADDING SYSTEM

### KNAUF AQUAPANEL EXTERIOR RENDER SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the Knauf Aquapanel Exterior Render System, consisting of Aquapanel Exterior Cement Board and Knauf basecoat and render finishes, for use as a ventilated exterior wall panel system on timber-frame buildings up to four storeys in height or steel-frame buildings up to 18 metres.

(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 accept the surface loadings likely to be met in the UK (see section 6).

**Behaviour in relation to fire** — depending on the finish, the system has a reaction to fire classification of B-s1, d0 or B-s2,-d0, in accordance with BS EN 13501-1 : 2007 (see section 7).

**Weathertightness** — the system will resist the passage of moisture from the ground and from weather (see section 9).

**Durability** — the system will have a service life in excess of 30 years (see section 11).

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

Date of First issue: 21 September 2017

Brian Chamberlain  
Head of Technical Excellence

Claire Curtis-Thomas  
Chief Executive

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, the Knauf Aquapanel Exterior Render 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)

<b>Requirement:</b>	<b>A1(1)</b>	<b>Loading</b>
Comment:		The system is acceptable for use as set out in sections 6.2 to 6.10 of this Certificate.
<b>Requirement:</b>	<b>B4(1)</b>	<b>External fire spread</b>
Comment:		The system can satisfy this Requirement. See sections 7.1 to 7.7 of this Certificate.
<b>Requirement:</b>	<b>C2(b)(c)</b>	<b>Resistance to moisture</b>
Comment:		The system will meet this Requirement. See sections 4.5 and 9 of this Certificate.
<b>Regulation:</b>	<b>7</b>	<b>Materials and workmanship</b>
Comment:		The system is acceptable. See sections 11.1 and 11.2 and the <i>Installation</i> part of this Certificate.



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

<b>Regulation:</b>	<b>8(1)(2)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:		The system can contribute to a construction satisfying this Regulation. See sections 10, 11.1 and 11.2 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	1.1(a)(b)	Structure
Comment:		The system is acceptable, with reference to clause 1.1.1 <sup>(1)(2)</sup> . See sections 6.2 to 6.10 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 <sup>(1)(2)</sup> , 2.4.2 <sup>(1)(2)</sup> and 2.4.9 <sup>(1)(2)</sup> . See section 7.10 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The system can contribute to satisfying this Standard, with reference to clause 2.6.4 <sup>(1)(2)</sup> . 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 clause 2.6.4 <sup>(1)(2)</sup> . See sections 7.1 to 7.9 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will contribute to meeting this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> to 3.10.3 <sup>(1)(2)</sup> . See sections 4.5 and 9 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.

<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
<b>Comment:</b>		Comments in relation to the system 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).
<hr/>		
	<b>The Building Regulations (Northern Ireland) 2012 (as amended)</b>	
<b>Regulation:</b>	<b>23(a)(i)(iii)</b>	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>		The system is acceptable. See sections 11.1 and 11.2 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>28(b)</b>	<b>Resistance to moisture and weather</b>
<b>Comment:</b>		The system will contribute to meeting this Regulation. See sections 4.5 and 9 of this Certificate.
<b>Regulation:</b>	<b>30</b>	<b>Stability</b>
<b>Comment:</b>		The system is acceptable as set out in sections 6.2 to 6.10 of this Certificate.
<b>Regulation:</b>	<b>36(a)</b>	<b>External spread of fire</b>
<b>Comment:</b>		The system can satisfy this Regulation. See sections 7.1 to 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 section: **3 Delivery and site handling** (3.1 and 3.2) of this Certificate.

### Additional Information

#### NHBC Standards 2017

In the opinion of the BBA, Knauf Aquapanel Exterior Render 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)*, Chapters 6.2 *External timber framed walls*, 6.10 *Light steel framed walls and floors* and 6.11 *Render*.

#### CE marking

The Certificate holder has taken the responsibility of CE marking the system components in accordance with European Technical Approvals ETA-13/0542, ETA-13/0555 and ETA-07/0173. An asterisk (\*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

### Technical Specification

#### 1 Description

1.1 The Knauf Aquapanel Exterior Render System consists of Aquapanel Exterior Cement Board, comprising Portland cement and an aggregate core (which is reinforced with a polymer-coated glassfibre mesh on the back and front surfaces), and finished with Knauf basecoat/renderers. It forms a ventilated system in timber- and steel-framed buildings.

1.2 The boards are screwed to vertical preservative-treated timber battens or to steel top-hats (as shown in Figure 1). Horizontal preservative-treated counter battens or steel top-hats are needed at 600 mm spacing when the vertical batten centres are to be set at less than 600 mm spacing, or at less than the timber-frame stud centres (shown in Figure 1 for clarity only.)

1.3 After the boards have been installed (with a 3 to 5 mm gap between each board) and secured to the vertical timber battens or steel top-hat sections, any joints are adequately filled with Knauf Aquapanel exterior joint filler (and exterior tape). Basecoat is trowel-applied to the required thickness (3 to 4 mm) onto their surface and a reinforcing mesh is applied and fully embedded. A further layer of basecoat (2 to 3 mm) is applied over the embedded reinforcing mesh in order to achieve the required overall thickness of 5 to 7 mm. After the basecoat has cured, primer is applied; the surface is then ready for the application of the selected finishes (as described in section 1.4 of this Certificate).

1.4 The system comprises the following components:

**Aquapanel board** – see Table 1.

*Table 1 Aquapanel Exterior Cement Board characteristics*

Width (mm)	900	1200
Thickness* (mm)	12.5	12.5
Lengths	1200, 1250, 2000, 2400, 2500, 2800	900, 2000, 2400, 2500, 2800, 3000
Approximate mass per unit area (kg·m <sup>-2</sup> )	14.37	14.37
Approximate dry density* (kg·m <sup>-3</sup> )	1150	
Modulus of rupture* (MPa)	9.6	9.6

#### **Batten or rail profiles**

- Ventilation Channel — a 60 mm by 25 mm perforated horizontally-fitted galvanized steel top hat profile to which the vertical top hat channel profile is fitted
- Top hat Channel — a 60 mm by 25 mm vertically-fitted galvanized steel top hat profile to which the Aquapanel is fitted
- Timber battens — minimum 60 mm by 25 mm timber battens can be used instead of the galvanized rail profiles where specified for a timber-frame structure.

#### **Fixings**

- Aquapanel Exterior Maxi Screws — corrosion-resistant coated screws complying with BS EN 14566 : 2008, SN 25 (length 25 mm, diameter 4.2 mm), for use in steel top hats up to 0.7 mm thick with a single layer of board; SN 39 (length 39 mm, diameter 4.2 mm), for use in timber-frame construction with a single layer of board; and SB 25, for use in steel top hats from 0.8 mm to 2 mm thick with a single layer of board
- Aquapanel Exterior Maxi Screws — stainless steel screws, SN 40 (length 40 mm, diameter 4.0 mm), for use in timber battens for a single layer of boards.

#### **Jointing and reinforcing components**

- Aquapanel Exterior Joint Filler Grey — cement-board filler for application to gaps between boards, and for bonding tape or reinforcing tape to board
- Aquapanel Exterior Tape (50 m by 100 mm) 0.12 (kg·m<sup>-2</sup>) — glassfibre, alkali-resistant tape for reinforcing exterior joints by embedding in the Aquapanel Exterior Joint Filler Grey. For use with rendered and alternative finishes
- Aquapanel Exterior Reinforcing Tape (50 m by 200 mm) 0.12 (kg·m<sup>-2</sup>) — glassfibre, alkali-resistant tape for reinforcing exterior joints by embedding in the Aquapanel Exterior Joint Filler Grey. For use when the basecoat is left unfinished or painted only.

#### **Basecoat**

- Knauf SM700 Pro Basecoat — a mixture of Portland cement, supplied as a powder to which clean water is added. Available in white
- Knauf SM700 Basecoat — a mixture of Portland cement, supplied as a powder to which clean water is added. Available in grey.

### **Reinforcing mesh**

- Knauf Reinforcing Mesh — alkali-resistant glassfibre, with a 5 mm by 5 mm or 4 mm by 4 mm grid size, polymer coating and nominal weight of 200 g.m<sup>-2</sup> or 160 g.m<sup>-2</sup>.

### **Primer**

- Knauf Quarzgrund Basecoat Primer — a water-based emulsion for priming the basecoat prior to the application of Knauf Exterior Render finishes.

### **Finishes**

- Knauf Noblo Finish — pre-mixed dry mortar with lime/cementitious binder, requiring the addition of about 25% to 30% water. Available in grain sizes 1.5 mm, 2 mm and 3 mm, with the finish regulated by grain size
- Knauf Conni S Finish — ready-mixed vinylic/siloxane binder giving a textured finish. Available in four grain size: 1 mm, 1.5 mm, 2 mm and 3 mm
- Knauf SP260 — pre-mixed dry mortar with lime/cementitious binder, requiring the addition of 25% to 30% water. Available in grain sizes 2 mm, 3 mm and 5 mm, with the finish regulated by grain size.

Figure 1 Aquapanel Exterior Render System

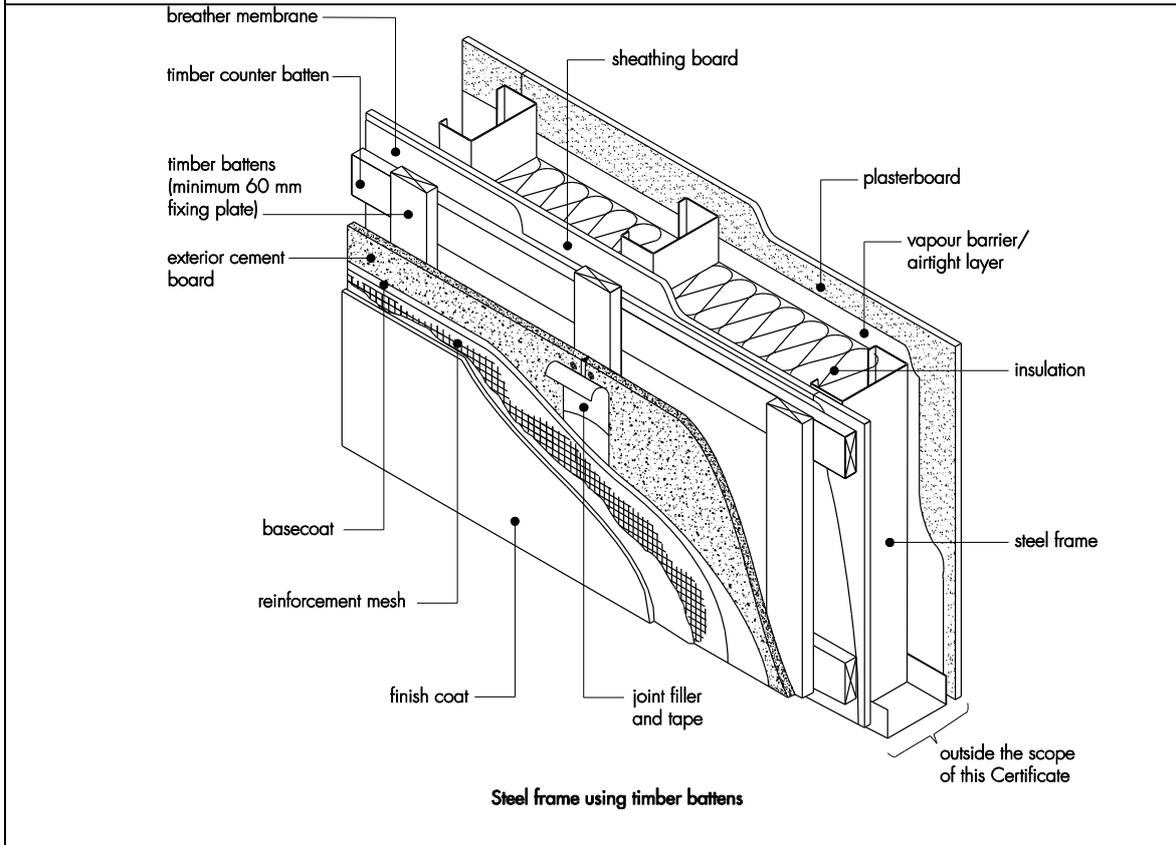
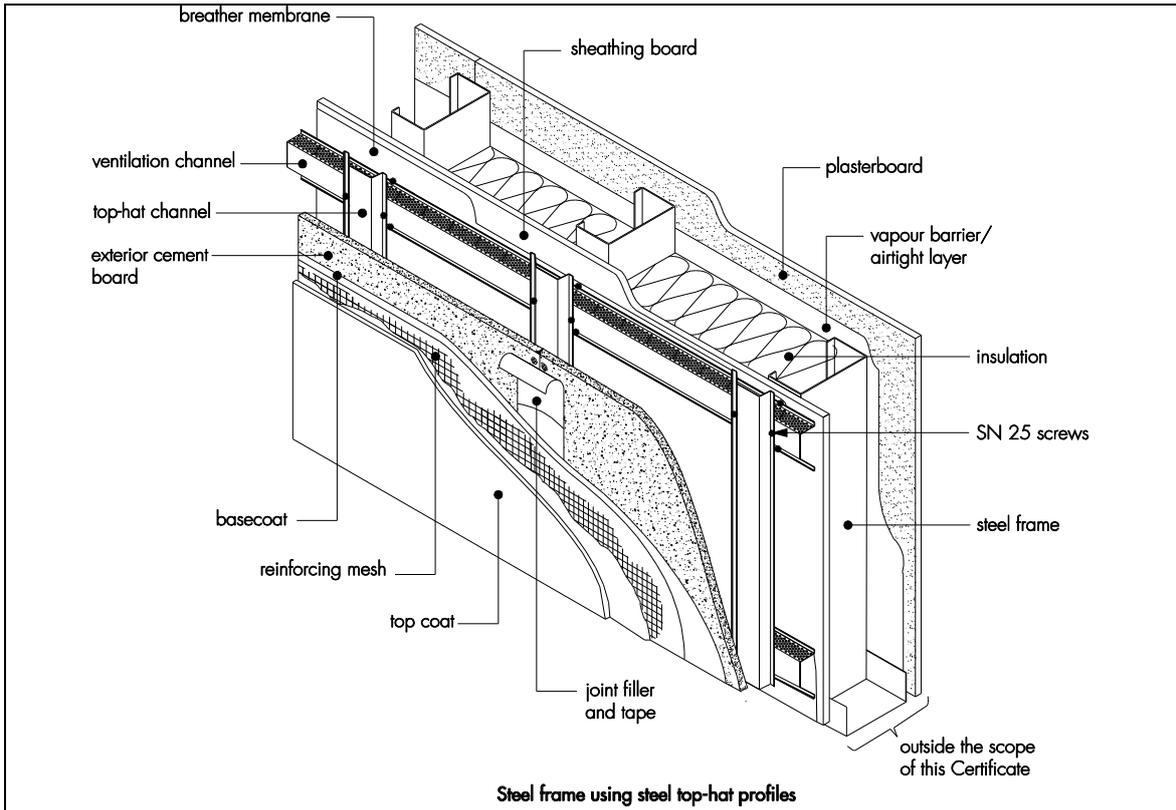
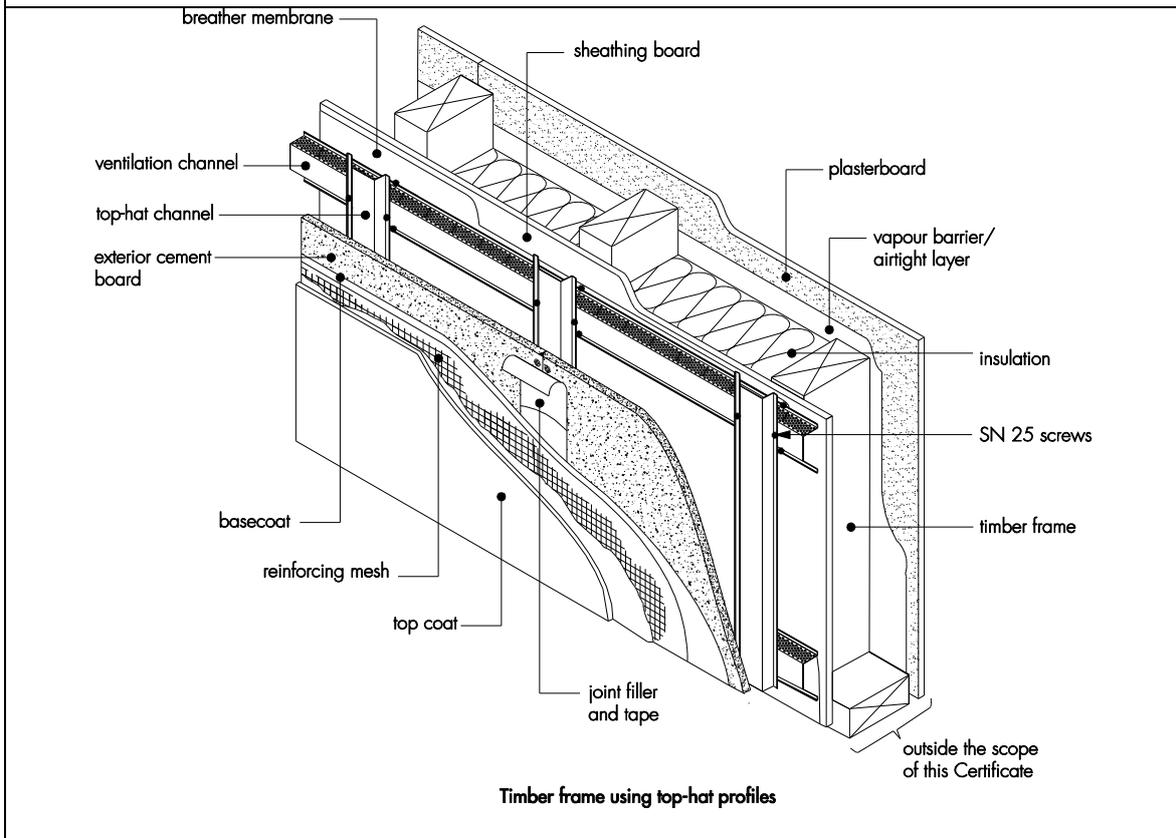
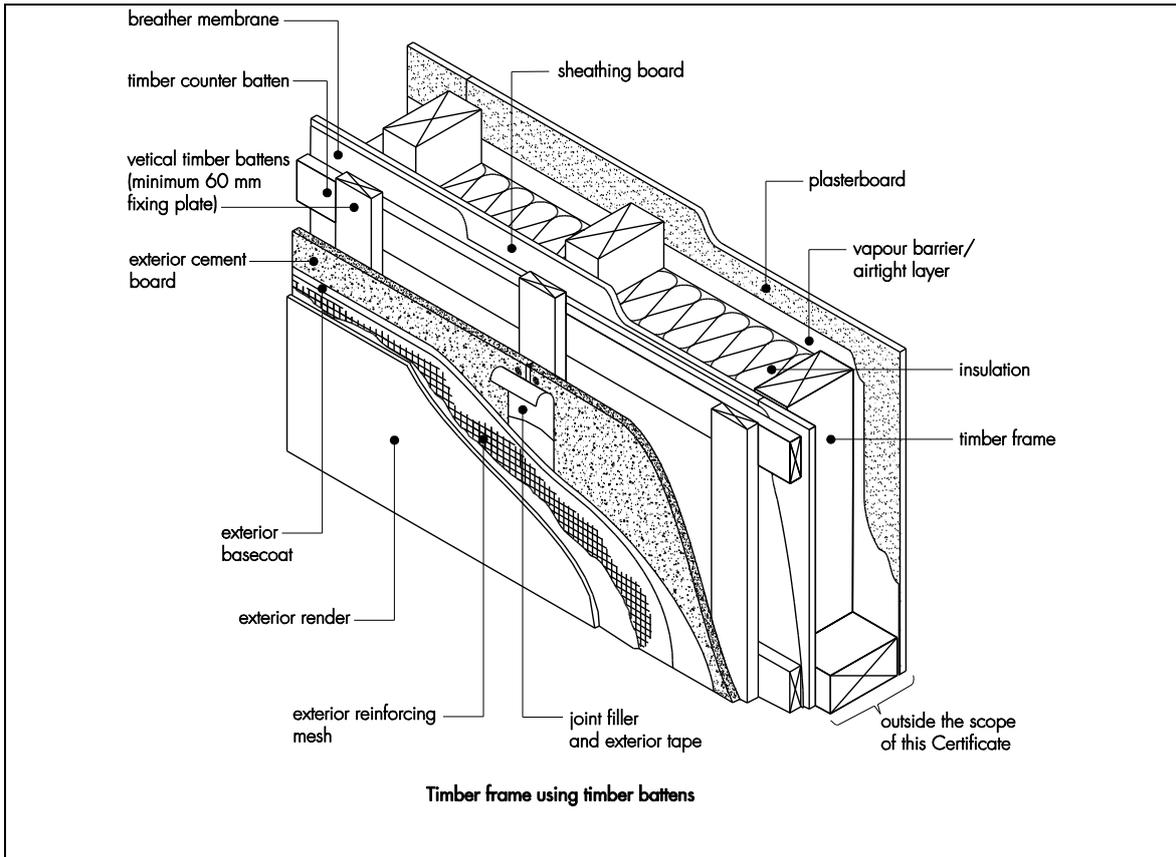


Figure 1 Aquapanel Exterior Render System — continued



#### 1.5 Ancillary materials used with the system:

- range of aluminium, PVC-U or stainless steel profiles, comprising:
  - base profile
  - edge profile
  - corner profile with mesh and optional PVC-U nosing
  - render stop profile.

#### 1.6 Ancillary materials also used with the system but outside the scope of this Certificate:

- movement joint
- expansion joint
- profile connectors and fixings
- sealants — silicone in accordance with BS EN ISO 11600 : 2003
- breather membrane
- timber and steel frame structure.

## 2 Manufacture

2.1 The boards are manufactured from a cement mixture, lightweight core material and water, and reinforced on both sides with an alkali-resistant glassfibre fabric.

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 being operated by the manufacturer are being maintained.

2.3 The management system of Knauf USG Building Systems ABEE has been assessed and registered as meeting the requirements of BS EN ISO 9001: 2008 by MPA NRW (Certificate MPS NRW Q221).

## 3 Delivery and site handling

3.1 Aquapanel Exterior Cement Board is polythene-shrink-wrapped onto pallets. Boards should be stored inside once the pallet has been opened, and stacked on a level base.

3.2 Details of packaging and weights of other components of the system are given in Table 2. Each package carries the product identification and manufacturer's batch number.

Table 2 Component characteristics

Component	Weight (kg)	Packaging
Aquapanel Exterior Cement Board	14.37 (kg·m <sup>-2</sup> )	pallet of 30 to 50
Preservative-treated timber battens 60 mm x 25 mm	—	bale of 100
Ventilation Channel	—	bale of 100
Top-Hat Channel	—	bale of 100
Aquapanel Exterior Maxi Screws (SN 25)	1.8	box of 500
Aquapanel Exterior Maxi Screws (SN 39)	2.0	box of 500 (also box of 1000, collated)
Aquapanel Exterior Maxi Screws (SB 25)	1.5	box of 500
Aquapanel Stainless Steel Screws (SN 40)	0.7	box of 250
Aquapanel Exterior Joint Filler Grey	20	bag
Aquapanel Exterior Tape	0.12 (kg·m <sup>-2</sup> )	100 mm x 50 m roll
Aquapanel Exterior Reinforcing Tape	0.8	200 mm x 50 m roll
Knauf SM700 Pro Basecoat	25	bag
Knauf SM700 Basecoat	25	bag
Knauf Reinforcing Mesh	15	1000 mm x 50 m roll
Knauf Quarzgrund Basecoat Primer	15	pail
Knauf Noblo topcoat	25	bag
Knauf Conni S 1.5 mm topcoat	25	pail
Knauf SP260 topcoat	25	bag

3.3 The boards must be protected, either by storing opened packs under cover or re-covering with opaque polythene sheeting. Care must be taken to avoid contact with solvents or materials containing volatile organic components.

3.4 The timber battens must be stored in a dry store and on a level surface raised off the ground.

3.5 The ventilation rails and top-hat battens must be stored level and dry to avoid damage.

3.6 The basecoat and topcoats and all cementitious materials must be stored in dry conditions between 5°C and 30°C, off the ground and protected from moisture. Contaminated material must be discarded.

3.7 The primer should be stored in a safe area, under cover, and protected from excessive heat and frost at all times.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Knauf Aquapanel Exterior Render System.

## Design Considerations

### 4 General

4.1 The Knauf Aquapanel Exterior Render System is satisfactory for use as a ventilated exterior wall cladding system on timber- and steel-frame buildings, when installed in accordance with this Certificate. It is essential that the detailing is carried out appropriately if the ingress of water is to be avoided and the full benefit obtained from the system.

4.2 The system is for application to the outside of sheathed timber- or steel-framed structures, on new domestic and non-domestic buildings. Prior to the installation of the system, wall surfaces should comply with section 14 of this Certificate.

4.3 The system using a steel frame and steel top-hats is for application up to 18 metres.

4.4 The system using a timber frame is for application up to four storeys in height.



4.5 New walls that are subject to national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS EN 1995-1-1 : 2004 and its UK National Annex (for timber structures)
- BS EN 338 : 2016 (boards exterior grade coating)
- BS EN 14081-1 : 2005 (exterior grade for timber framed structures)
- BS EN 13986 : 2004 (wood-based panels for use in construction)
- BS 4978 : 2007 (boards marking)
- BS EN 1993-1-3 : 2006 and its National Annex (design of steel structures).

4.6 The system must provide a nominal 25 mm wide drained and ventilated cavity between the sheathing board and the Aquapanel. The cavity is drained and ventilated at the base to the outside air.

4.7 The structural frame of the building including the sheathing boards is the responsibility of the building designer and is outside the scope of this Certificate. However, the timber-frame or steel-frame structural wall of sheathing and associated fixings must be designed to resist racking due to wind and other forces (see Table 3 for minimum specifications) and give an acceptable resistance to pull-out of fixings (see section 7).

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

4.9 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.

*Table 3 Minimum construction specification*

Item	Specifications
Timber-frame structure <sup>(1)</sup>	Exterior grade in accordance with BS EN 338 and BS EN 14081-1, and dry graded and marked in accordance with BS 4978. The timber structure should not be less than 37 mm thick with a minimum width of 72 mm or 0.026 times the panel height in mm, whichever is the greater
Sheathing board <sup>(1)</sup> (Oriented Strand Board-OSB3)	11 mm thick minimum, with a minimum density of 600 kg·m <sup>-3</sup> and modulus of elasticity in bending > 3500 (Nw·m <sup>-2</sup> ). Manufactured to BS EN 300:2006 Class 3
Steel-frame structure <sup>(1)</sup>	Continuously hot-dip coated in accordance with BS EN 10346. The LWSF structure should be not less than 1.2 mm thick with a minimum of 50 mm flanges, in accordance with BS EN 1993-1-3 and its UK National Annex
Sheathing board <sup>(1)</sup> (cement-bonded particle board — CPB)	12 mm CPB 1380 kg·m <sup>-3</sup> apparent density and > 4500 modulus of elasticity in bending (MPa). Class 1 in accordance with BS EN 634-2

(1) The board and the structural frame must be of an exterior grade and the minimum acceptable specifications is given here. Note that both components are outside the scope of this certificate.

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

4.11 The system will provide a degree of protection against rain ingress and a decorative finish. However, care should be taken to ensure that walls are adequately weathertight prior to its application. It may only be installed where there are no signs of dampness on the inner surface of the wall other than those caused solely by condensation.

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

4.13 The fixing of sanitary pipework, plumbing, rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items to the systems are outside the scope of this Certificate. The Certificate holder should be contacted for further advice.

4.14 External pipework and ducts should be fixed after installation. The Certificate holder should be contacted for further advice.

4.15 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.

4.16 The system must be protected by an overhang and window sills should be designed and installed so as to direct water away from the building.

4.17 It is essential that these systems are installed and maintained in accordance with the conditions set out in this Certificate.

## 5 Practicability of installation

The system should only be installed by specialised contractors who have successfully undergone training and registration by the Certificate holder (see section 13).

## 6 Strength and stability

### Wind loading

6.1 A suitably qualified and experienced individual must check the design and installation of the cladding system, including the adequacy of the substrate wall to which the cladding is to be fixed, to ensure that an adequate number of suitable fixings are used to attach the system.



6.2 When installed in accordance with the requirements of this Certificate and the Certificate holder's instructions, the cladding system will withstand, without damage or permanent deformation, the stresses imposed by self-weight and wind loads likely to be experienced in the UK. For design purposes:

6.3 The frame and the support rails should be designed to limit mid-span deflections to  $L/200$  and cantilever deflections to  $L/150$ . Board mid-span deflections should be limited to  $L/500$ .

6.4 The supporting walls must be able to take the full wind actions as well as any racking loads. The cladding system cannot be assumed to contribute in this respect.

6.5 Wind actions should be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. The higher pressure coefficients applicable to corners of buildings should be used.

6.6 The maximum allowable pull-out resistance of the fixing to be used for securing the board to the support rails/battens should be determined by tests, using a minimum safety factor of 3 on the characteristic failure load.

6.7 The maximum allowable pull-through resistance (kN) for the stainless steel screws/Maxi screws are given in Table 4.

Table 4 Stainless steel screws/Maxi screws

Screws	Pull through value <sup>(1)</sup> (kN)			Pull through value <sup>(1)</sup> (kN)		
	Centre	Edge (25 mm minimum)	Corner (25 mm minimum)	Centre	Edge (25 mm minimum)	Corner (25 mm minimum)
Maxi Screws SN 25 <sup>(2)(3)(4)</sup>	0.30	0.21	0.14	-	-	-
Maxi Screws SN 39 <sup>(2)(3)(5)</sup>	-	-	-	0.26	0.19	0.15
Maxi Screws SB 25 <sup>(2)(3)(4)</sup>	0.31	0.19	0.16	-	-	-
Maxi Screws SN 40 <sup>(2)(3)(5)</sup>	-	-	-	0.42	0.19	0.14

(1) The characteristic pull-through values were obtained in accordance with BS EN 1990 : 2002, Annex D7.2, using a safety factor of 2.

(2) The safety factor is applied and based on the assumption that all boards are quality controlled and tested to establish tensile strength perpendicular to the faces on a periodic basis.

(3) Other fixings may be used provided they can be demonstrated to have equal or higher pull-out, plate diameter, stiffness and mechanical characteristics.

(4) Use with steel top-hat profiles.

(5) Use with timber battens.

6.8 For design purposes, the board may be assumed to have the following mechanical properties:

- allowable flexural stress 2.4 N·mm<sup>-2</sup>
- flexural modulus 4000 N·mm<sup>-2</sup>.

6.9 The board, when incorporated in a cladding system comprising support members (eg timber battens — see Figure 1) at 400 mm centres, and specified screws at maximum 250 mm centres with a minimum embedment of 25 mm in structural grade BS 5534:2014 timber battens and a minimum of 10 mm thread through the back of the steel flange, should adequately resist all wind pressures likely to be experienced in the UK. For other member spacing, fixing arrangements and design wind pressures, the structural adequacy of the board should be checked by a suitably-qualified engineer.

### Impact resistance

6.10 The cladding system incorporating vertical timber battens at 600 mm centres, achieved adequate hard and soft body impact resistance for use in categories II, III and IV as defined in ETAG 034 Part I : 2012 as seen in Table 5.

Table 5 Use Categories

Use Category	Description
Category I <sup>(1)</sup>	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use
Category II	A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the 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
Category III	A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects
Category IV	A zone out of reach from ground level

(1) Category I shown for information only and not suitable for this cladding system.

## 7 Behaviour in relation to fire



7.1 The reaction to fire classification of the systems are B-s1, d0 and B-s2, d0 in accordance with BS EN 13501-1 : 2007 (see Table 6).

Table 6 Fire classifications

Rendering System: SM700 and SM700 Pro base coat + finishing coats indicated below	Fire classification
Knauf Noblo topcoat	Class B-s1, d0
Knauf SP260 topcoat	
Knauf Conni topcoat	Class B-s2, d0

7.2 The Aquapanel Exterior Cement Board has an A1 rating when classified in accordance with BS EN 13501-1 : 2007 and can be regarded as a ‘non-combustible’ material as defined in the national Building Regulations.

7.3 The classification applies to the full range of colours available on the finishing coats with up to 2% organic content for Knauf Noblo and SP260 finishes and 7.1% organic content for Knauf Conni S finish.

7.4 The resistance to fire of the installed system depends on the performance of the wall on which the system has been installed. This can only be determined by tests from a suitably-accredited laboratory, and therefore is not covered by this Certificate.

7.5 Timber-framed systems using timber battens are restricted for use in buildings up to four storeys in height.

7.6 Steel framed systems using steel top hats are restricted for use in buildings up to 18 m in height.

7.7 For houses in Scotland, and for all buildings in England and Wales and Northern Ireland, the systems are considered suitable for use on, or at any distance from, the boundary.



7.8 For flats and maisonettes and non-domestic buildings in Scotland, the systems are suitable only for use more than one metre from the boundary.

7.9 The systems are not classified as ‘non-combustible’; therefore, calculations for unprotected areas may apply dependent on the fire resistance characteristics of the wall.

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

## 8 Proximity of flues

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

**England and Wales** — Approved Document J

**Scotland** — Mandatory Standard 3.19, clauses 3.19.1<sup>(1)(2)</sup> to 3.19.4<sup>(1)(2)</sup> and 3.19.8<sup>(1)(2)</sup>

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

**Northern Ireland** — Technical Booklet L.

## 9 Weathertightness



9.1 The system resists the passage of moisture and from weather. Any water collecting in the cavity due to rain or condensation will be removed by drainage and ventilation.

9.2 The air space between the back of the boards and the supporting substrate should be at least 25 mm wide<sup>(1)</sup>.

9.3 The cladding system is not airtight and includes a back ventilated drained cavity.

9.4 The supporting wall must be weathertight.

9.5 At the top of walls, the system should be protected by an adequate coping, overhang or other detail designed for use with these types of systems (see section 16).

(1) Guidance on recommended cavity widths is given in *NHBC Standards*, Chapter 6.2 *External timber framed walls* and Chapter 6.9 *Curtain walling and cladding*.

## 10 Maintenance and repair



10.1 An initial inspection should be made within 12 months and regularly checked thereafter to include:

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

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

## 11 Durability



11.1 The durability and service life of the system will depend upon the building's location, immediate environment and the intended use of the building.

11.2 Provided regular maintenance is carried out, as described in section 10 and in accordance with the Certificate holder's instructions, the system can be expected to have a service life in excess of 30 years when used in normal UK climatic conditions. However, durability may be extended by periodic re-coating of the finish.

11.3 The renders containing Portland cement may be subject to lime bloom. The occurrence of this may be reduced by avoiding application in adverse weather conditions. The effect is transient and is less noticeable on lighter colours.

11.4 The renders may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas. The appearance may be restored by a suitable power wash or, if required, by over coating.

11.5 Any colour change will be slight and uniform on any one elevation, and the system should have a decorative life of approximately 20 years.

11.6 To maintain a high quality aesthetic appearance, it may be necessary to periodically overcoat the building using system-compatible coatings as recommended by the Certificate holder and in accordance with BS EN 1062-1 : 2004 (outside the scope of this certificate ). Care should be taken not to adversely affect the water vapour transmission or fire characteristics of the system. The advice of the Certificate holder should be sought as to the suitability of a particular product.

### 12 Site survey and preliminary work

12.1 A pre-installation survey must be carried out by the installer to determine the suitability of the building for installation, and any repairs that will be necessary prior to installation of the system. A specification is prepared for each elevation of the building including:

- detailing around windows, doors and at eaves
- any alterations to external plumbing
- areas where flexible sealants will be required
- the positions of fire barriers (where required)
- pull-out strength of the fixings used to secure the members to the structure.

12.2 The design of each installation must be checked by a suitably-qualified engineer (or similar competent person) and take into account the nature and quality of the substrate wall, location, supporting rails/battens and fixings. The appropriate safety factor for interface characteristic data must be applied in order to obtain the design data.

12.3 It is recommended that external plumbing is fitted upon completion, on the finished face.

12.4 On all buildings, purpose-made window sills must be fitted to extend beyond the finished face of the system.

### 13 Approved installers

Application of the systems, within the context of this Certificate, must be carried out by approved installers recommended or recognised by the Certificate holder. Such an installer is a company:

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

### 14 General

14.1 Installation of the Knauf Aquapanel Exterior Render System must be carried out strictly in accordance with the provisions of this Certificate and the Certificate holder's instructions (see Figure 1 for typical installation detailing). Horizontal counter battens (shown in Figure 1) are needed when the vertical battens centres are to be set at less than 600 mm centres (or at less than the timber frame stud centres).

14.2 The level of supervision during installation of system and the associated structure must be sufficient to ensure the quality of workmanship.

14.3 The substrate wall to which the cladding is fixed must be structurally sound and constructed in accordance with the requirements of the relevant national Building Regulations and Standards.

14.4 Timber stud walls and timber support work 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 and BS 8417 : 2011.

14.5 Galvanized steel framework must be structurally sound, and designed and constructed in accordance with BS EN 1993-1-3 : 2006 and its UK National Annex.

14.6 Particular care is required around window and door openings to ensure that the structure is capable of sustaining the additional weight of the system.

14.7 Where a breather membrane is required, it must be installed and properly overlapped in accordance with the instructions of the membrane manufacturer and the building designer.

14.8 All window and door openings must be appropriately sealed to ensure that they are weathertight.

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

## 15 Procedure

### Aquapanel Exterior Cement Board

15.1 The timber battens or steel top-hats are fixed horizontally (where required) and vertically to the building depending on the Certificate holder's specifications. The ventilated and drainage base profile is then attached to the building, as shown in Figure 2.

Figure 2 Base details

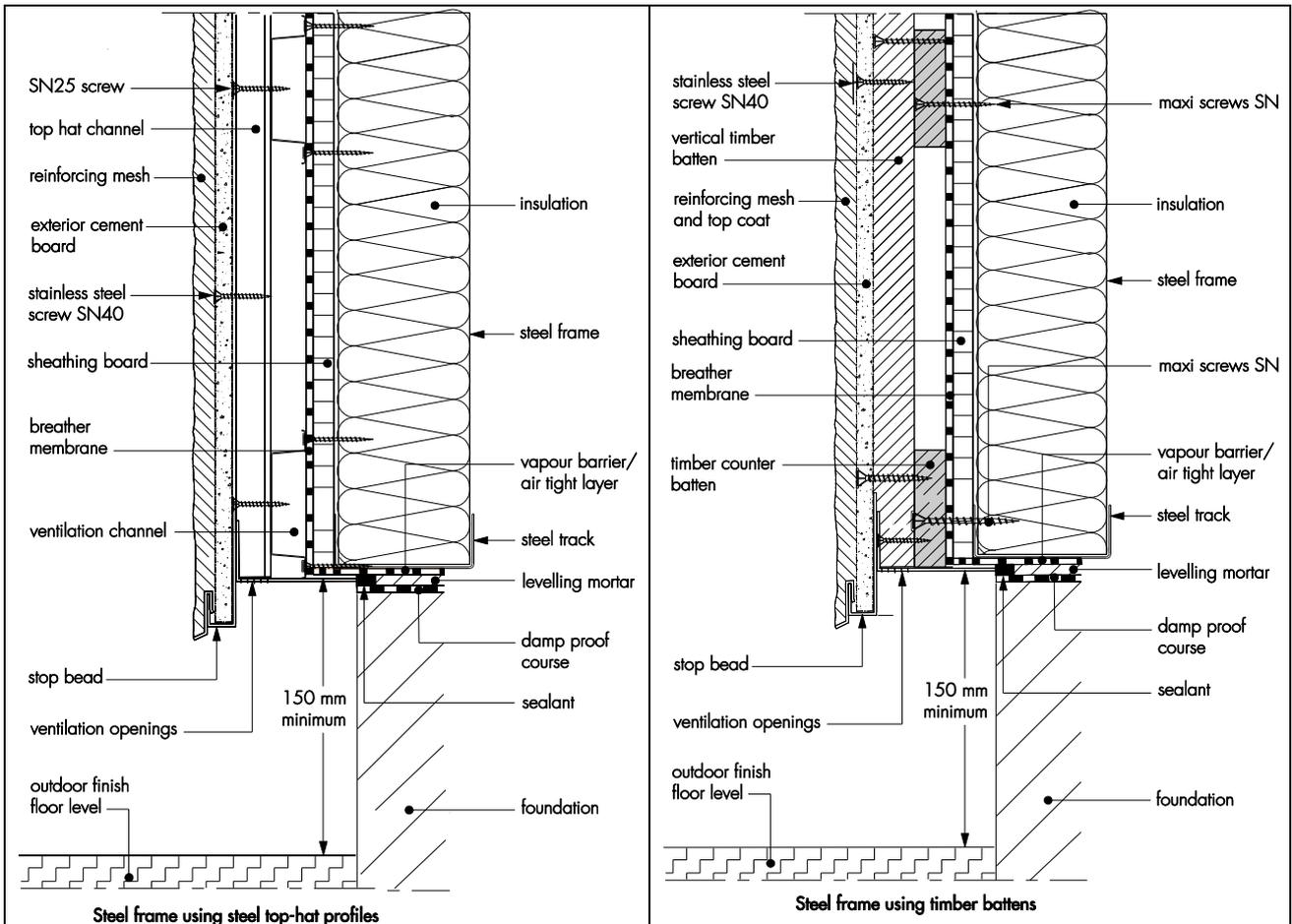
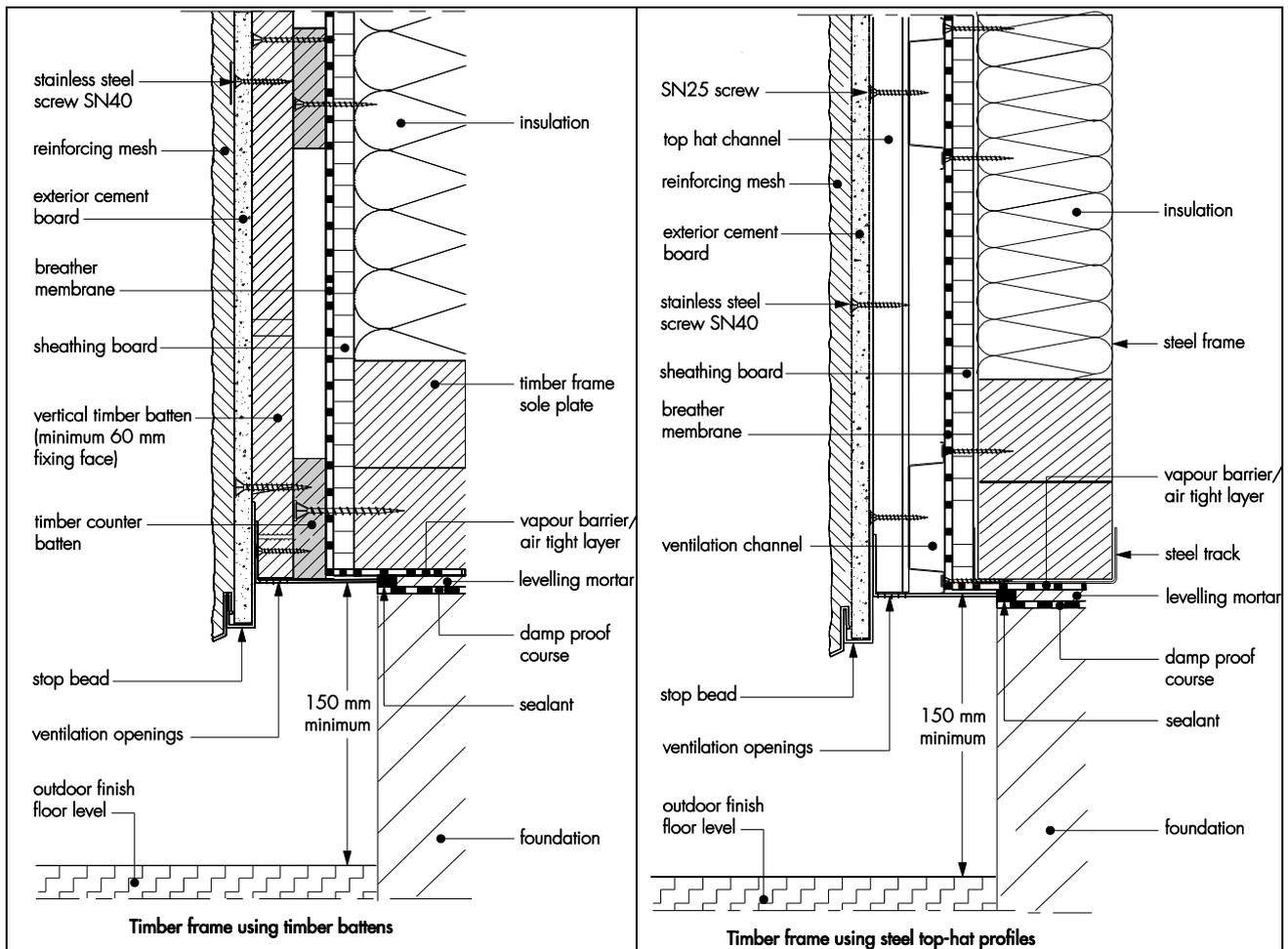


Figure 2 Base details – continued

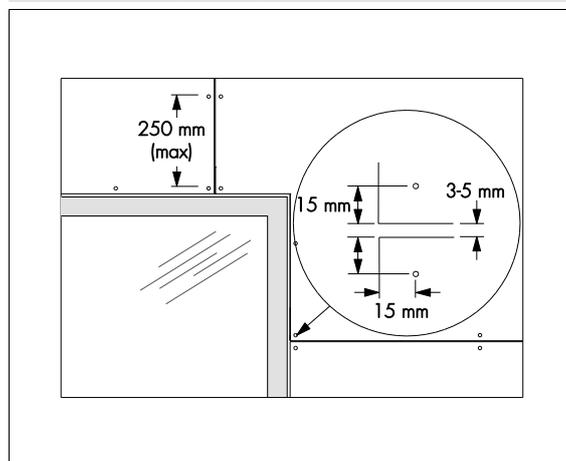


15.2 The boards should be protected from moisture and weathering prior to installation. Boards which have become damp must be dried on both sides on a flat surface prior to installation.

15.3 The board is supported on a minimum of three rails/battens, the centres of which should be at a maximum spacing of 625 mm.

15.4 Screws should be fixed at a minimum of 15 mm from board edges. The spacing for the screws should be no more than 250 mm and they should not be over-tightened (see Figure 3).

Figure 3 Fixings and spacing

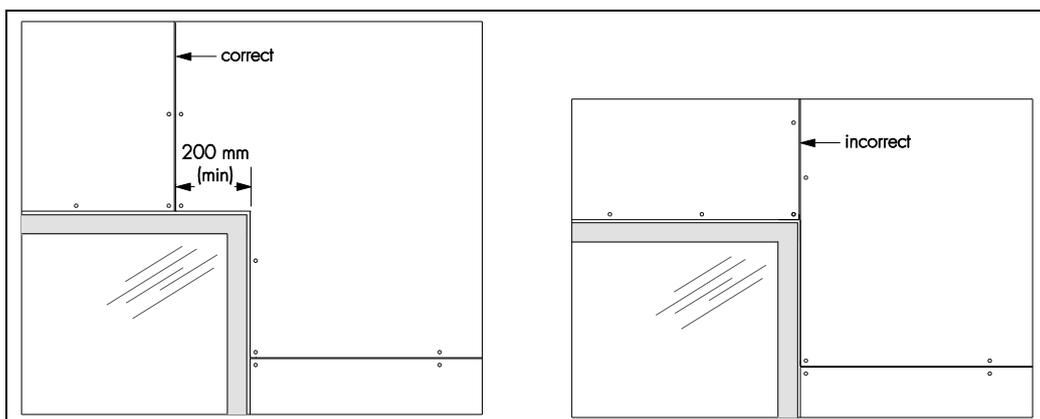


15.5 If it is necessary to cut boards, they should be scored and snapped with a kraft-type knife. Alternatively, a hand-held circular saw with a dust extractor or a pendulum jig saw can be used. The use of a carbide- or diamond-tipped saw blade is recommended.

15.6 The boards are fixed horizontally over supports with gaps between 3 mm and 5 mm. Successive rows of boards should be installed with vertical joints offset by a minimum of one stud cavity.

15.7 The boards are cut to fit up to the lintel and down to the sill of windows, ensuring that no continuous vertical joint is formed to avoid leakage and cracks (see Figure 4).

*Figure 4 Installation of boards around lintels*



15.8 Immediately after assembly, the substructure is protected by filling all joints and screw heads with Aquapanel Exterior Joint Filler Grey. Aquapanel Exterior Tape or Aquapanel Exterior Reinforcing Tape is immediately embedded, centred over all the joints.

15.9 Installation of Aquapanel Exterior Joint Filler Grey, basecoat and finishing materials must not be carried out at temperatures of 5°C and falling, or when frost is expected. Freshly-coated work should be protected from rain until fully cured.

15.10 All corners are reinforced by applying a 5 mm thick layer of Knauf Exterior Basecoat to the boards, and a corner profile is embedded.

15.11 Windows and other openings should be reinforced at the corners with extra pieces of Knauf Exterior Reinforcing Mesh (minimum size 500 mm by 300 mm) embedded into 5 mm of Knauf Exterior Basecoat.

15.12 The entire wall is covered with Knauf Exterior Basecoat with a notched trowel with 5 to 7 mm high notches. Knauf Exterior Reinforcing Mesh is embedded into the top third of these notches before the application of more Knauf Exterior Basecoat to create a smooth finish (the Certificate holder's product data sheets should be referred to for drying times).

15.13 The applicator should ensure that the final surface is smooth before applying Knauf Basecoat Primer or one of the render finishes.

15.14 When applying Knauf Exterior Finish, one coat of Knauf Basecoat Primer should be applied over the entire surface of dried Knauf Exterior Basecoat and left to cure (the Certificate holder's product data sheets should be referred to for drying times).

### **Render finishes**

15.15 The Certificate holder's advice should be sought regarding the preparation and application of either of the three render finishes. In particular, the following mixing and application thicknesses should be noted:

- Knauf Conni is ready-mixed and is applied to suit the grain size being used
- Knauf Noblo is dry mortar, mixed with water and applied to suit the grain size being used
- Knauf SP260 is dry mortar, mixed with water and applied to suit the grain size being used.

15.16 The finishes must not be applied in wet weather, and should not be applied at temperatures of  $\pm 5^{\circ}\text{C}$  and falling, or when frost is expected. Freshly-coated work should be protected from rain and frost until fully cured.

15.17 To avoid dry line joints, continuous surfaces should be completed without a break, working wet on wet.

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

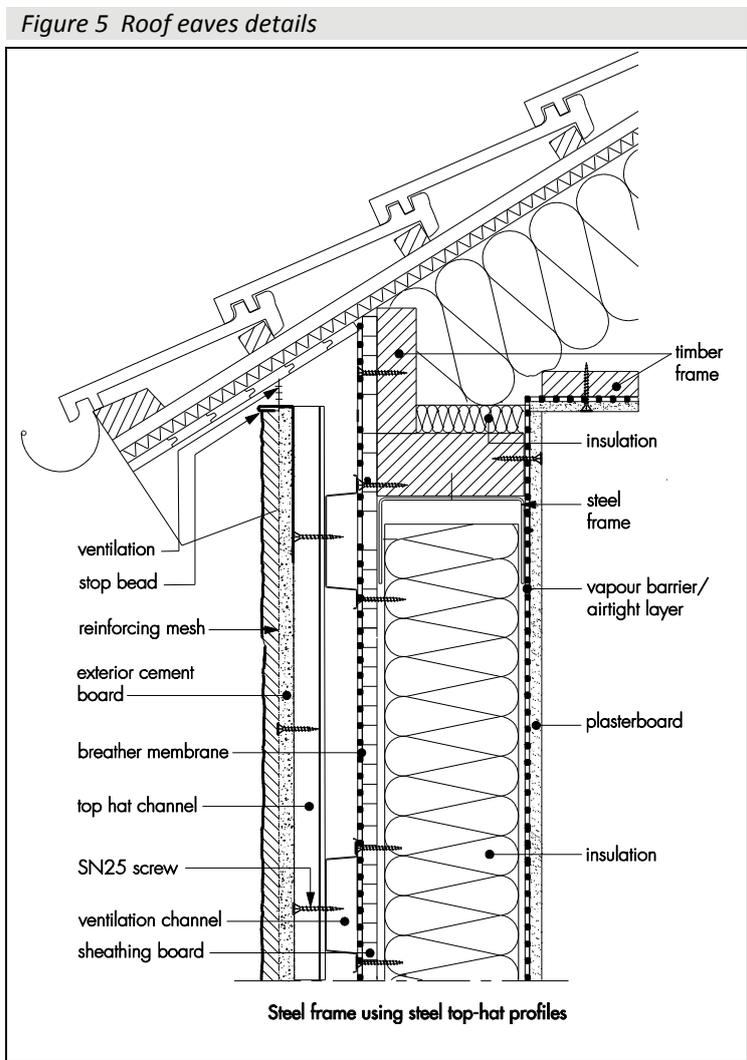


Figure 5 Roof eaves details – continued

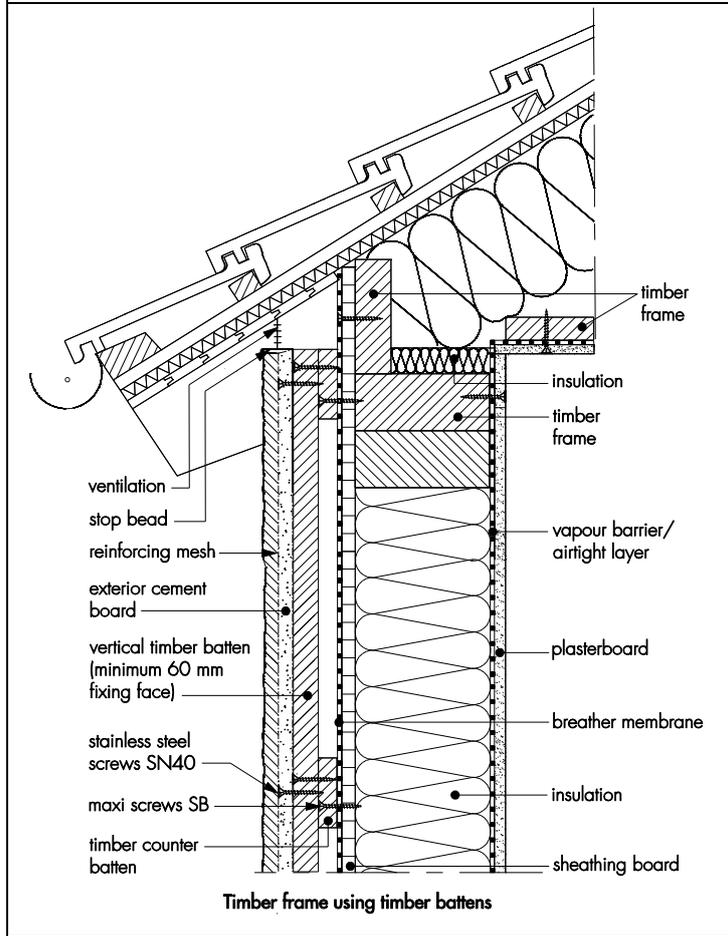
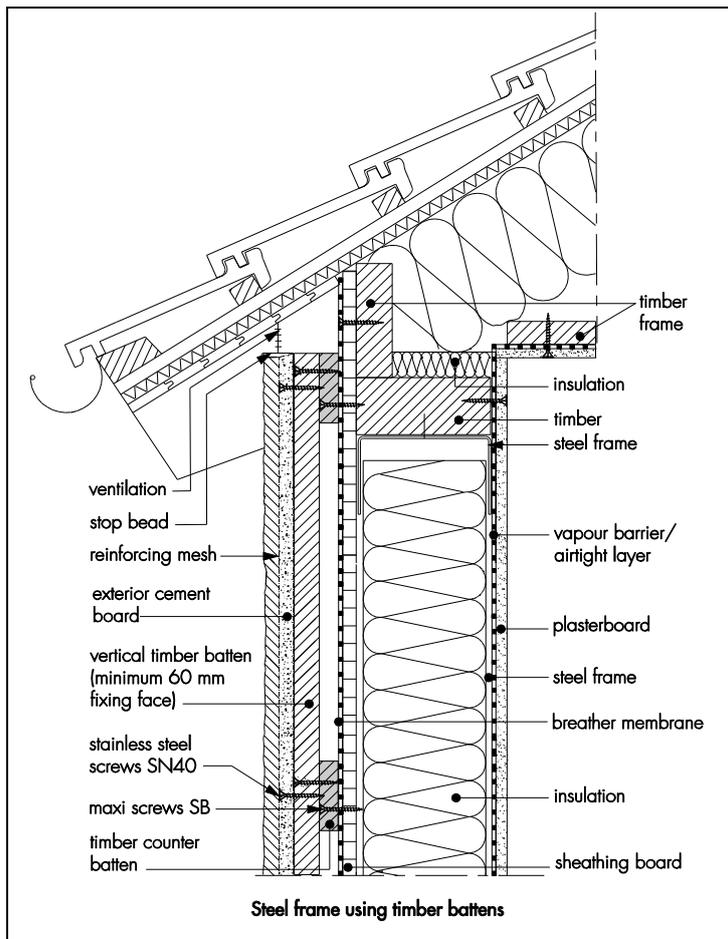
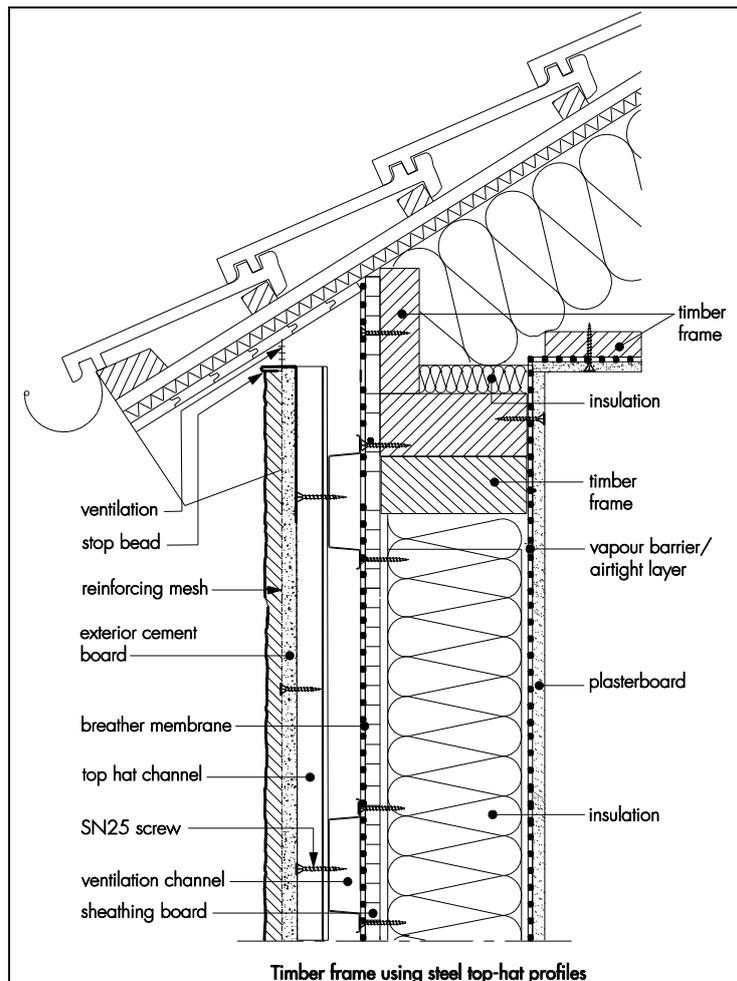


Figure 5 Roof eaves details – continued



## Technical Investigations

### 16 Tests

An assessment was made of the data resulting in the issue of European Technical Approval ETA-07/0173 for Aquapanel Cement Board including:

- bending strength
- shear strength
- tensile strength and elongation
- apparent density
- dimensional stability
- water vapour permeability
- impact resistance
- reaction to fire
- thermal conductivity
- pull-through/pull-out strength of fixings
- hygrothermal cycling

### 17 Technical investigations

17.1 The system's resistance to wind loading, mechanical resistance and stability was assessed.

17.2 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

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- BS 8417 : 2011 *Code of practice — Preservation of wood*
- BS EN 338 : 2016 *Structural timber — Strength classes*
- BS 5534 : 2014 + A1 : 2015 *Slating and tiling for pitched roofs and vertical cladding. Code of practice*
- BS EN 351-1 : 2007 *Durability of wood and wood-based products — Preservative-treated solid wood — Classification of preservative penetration and retention*
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- BS EN 1062-1 : 2004 *Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Classification*
- BS EN 1990 : 2002 *Eurocode — Basis of structural design*
- BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*
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- BS EN 10346 : 2015 *Continuously hot-dip coated steel flat products for cold forming — Technical delivery conditions*
- BS EN 13914-1 : 2016 *Design, preparation and application of external rendering and internal plastering — External rendering*
- BS EN 13986 : 2004 *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking*
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- BS EN ISO 11600 : 2003 *Building construction — Jointing products — Classification and requirements for sealants*
- ETA-07/0173 *Aquapanel Cement Board*
- ETA-13/0542 *Knauf Warm-Wand System MW/SM700 Pro*
- ETA-13/0555 *Knauf Warm-Wand System EPS/SM300*
- ETAG 034 Part I : 2012 *Guideline for European Technical Approval of Kits for External Wall Claddings*

### 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.