

AQUAPANEL®

Cement Board

Exterior systems



Build on our strength



AQUAPANEL® Cement



AQUAPANEL® Cement Board technology sets new standards for the design and construction of buildings across Europe. Developed by Knauf USG Systems, the AQUAPANEL® Cement Board system provides architects and distributors with a high quality and extremely economical alternative to traditional methods of construction, such as brick and block. AQUAPANEL® Cement Board Outdoor can be used in various types of exterior walls, in exterior ceilings, in façade renovations and other types of external and special projects.

AQUAPANEL® Cement Board is an extremely durable building material, providing a solid, dry base that can withstand the extreme weathering effects of wind, rain and snow. AQUAPANEL® Cement Board is an ideal substrate for plaster. It can be used as a basis for exterior walls in ventilated systems or water-managed (directly-applied) systems. As well as the panel and standard accessories, the AQUAPANEL® Cement Board system can also include an AQUAPANEL® plaster system for surface treatment.

Benefits of AQUAPANEL® Cement Board Outdoor:

Complete exterior wall construction and finishing

- A significant advance in the area of cement board technology
- Water resistant - no swelling or loss of stability
- Resistant to moisture and weathering
- Freeze – thaw cycle proven
- Stable and durable Portland cement construction
- Can be curved
- Impact resistant
- Safe and hygienic material
- Non-combustible

Productivity benefits

- No need for time-consuming processing methods and special tools
- Unique score and snap for faster, easier installation

- EasyEdge™ – the particularly shockproof edge
- Drylining technology means drying times are reduced
- Less working time required, lower installation costs on-site

A complete system

- Available in various sizes
- Meets European standards
- Comprehensive after-sales service and support anywhere in Europe
- Proven complete systems from a single source

Board Outdoor



Exterior systems



Knauf USG Systems leading the way

AQUAPANEL® Cement Board Outdoor is a proven system manufactured by Knauf USG systems, offering significant performance advantages in all types of buildings. Knauf USG Systems is a joint venture between Knauf and USG, two leading and well-established suppliers of interior and exterior systems and building materials.

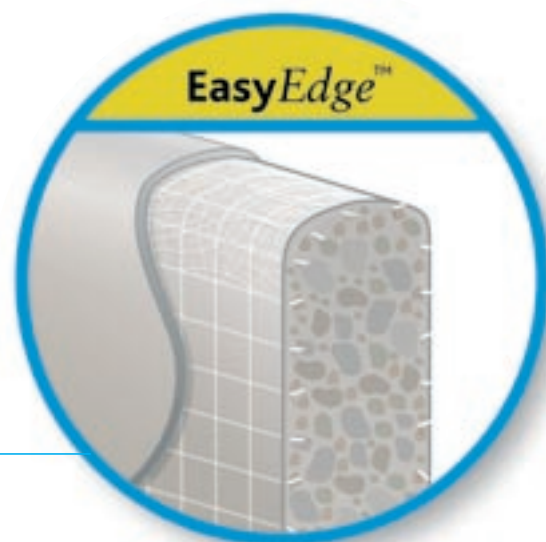
As the leading supplier of cement board in Europe, Knauf USG Systems is dedicated to developing innovative building materials. AQUAPANEL® Cement Board is now being used in interior, exterior and floor applications across Europe and is the cement board of choice for construction professionals.

This publication is designed to explain AQUAPANEL® Cement Board Outdoor in more detail to ensure that a perfect end result is achieved in your exterior application, every time.

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The EasyEdge™ strong, straight edge is wrapped with mesh embedded into the cement for extra strength. The EasyEdge™ ensures easy joint treatment with filler and tape, resulting in a stronger structure.



board

Product range

Abbro

Wall:

Approved accessories



AQUAPANEL® Cement Board Outdoor

Cement board with a Portland cement and aggregate core, with coated glass fibre mesh embedded in back and front surfaces. Ends are square cut and edges are reinforced and finished smoothly (the EasyEdge™).

Thickness: 12.5 mm
Width: 900 mm
Length: 1200, 2400, 1250, 2500 mm
Weight: approx. 16 kg/m²
Packaging:
 Length 1200, 1250 mm: 50 pieces per pallet
 Length 2400, 2500 mm: 25 pieces per pallet



AQUAPANEL® Maxi Screw SN 39 AQUAPANEL® Maxi Screw SN 25 AQUAPANEL® Maxi Screw SN 55

AQUAPANEL® Maxi Screw SN has been specially developed for fixing AQUAPANEL® Cement Board on to timber and metal frameworks (metal thickness from 0.6 to 0.7 mm). These screws have a needle point and a countersink. They have a special corrosion-proof coating, which gives a guaranteed 500 hours corrosion resistance in a salt spray test.

AQUAPANEL® Maxi Screw SN 39 is suitable for a single or double layer boards on a metal framework or a single-layer panel on a wooden framework.

AQUAPANEL® Maxi Screw SN 25 can be used for a single-layer panel on a metal framework.

AQUAPANEL® Maxi Screw SN 55 can be used for a double layer of boards on a wooden framework or for a triple layer of boards on a metal framework.

Coverage:
 15 pieces/m², stud spacing 600/625 mm
Packaging:
 AQUAPANEL® Maxi Screw SN 39: 500 pieces/pack
 AQUAPANEL® Maxi Screw SN 25: 1000 pieces/pack
 AQUAPANEL® Maxi Screw SN 55: 250 pieces/pack
 Collated screws available on request.



AQUAPANEL® Maxi Screw SB 39 AQUAPANEL® Maxi Screw SB 25

AQUAPANEL® Maxi Screw SB has been specially developed for fixing AQUAPANEL® Cement Board on to metal frameworks (metal thickness from 0.8 to 2 mm). The screws have a drill point and a countersink. They have a special corrosion-proof coating, which gives a guaranteed 500 hours corrosion resistance in a salt spray test.

AQUAPANEL® Maxi Screw SB 39 is suitable for a single or double layer of boards.

AQUAPANEL® Maxi Screw SB 25 can be used for a single layer of boards.

Coverage:
 15 pieces/m², stud spacing 600/625 mm
Packaging:
 AQUAPANEL® Maxi Screw SB 39: 250 pieces/pack
 AQUAPANEL® Maxi Screw SB 25: 250 pieces/pack
 Collated screws available on request.



AQUAPANEL® Rustproofed Screw SN 40

AQUAPANEL® Rustproofed Screws SN 40 have been specially developed for fixing AQUAPANEL® Cement Board Outdoor on to timber substructures. The screw length is 40 mm. The screws are manufactured from stainless steel.

Coverage:
 15 pcs./m², stud spacing 600/625mm
Packaging:
 AQUAPANEL® Rustproofed Screws SN 40: 250 pieces/pack



AQUAPANEL® Joint Filler – grey

AQUAPANEL® Joint Filler – grey is a cement-bound filling material for filling joints and embedding AQUAPANEL® Tape (10 cm).

Coverage:
 approx. 0.7 kg/m²
Packaging:
 10 kg/bag

ved accessories

AQUAPANEL® Tape (10 cm)

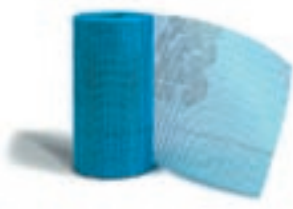
AQUAPANEL® Tape (10 cm) is a glass fibre tape with an alkali-resistant coating. It is used to reinforce exterior joints. It is embedded in the AQUAPANEL® Joint Filler – grey.



Coverage:
approx. 2.1 m/m²
Packaging:
10 cm wide rolls, 50 m long

AQUAPANEL® Exterior Reinforcing Tape

AQUAPANEL® Exterior Reinforcing Tape (33 cm) is a wide-meshed glass fabric. AQUAPANEL® Exterior Reinforcing Tape is used for reinforcing joints in exterior areas where a coat of paint is to be



applied on the AQUAPANEL® Exterior Basecoat. It is embedded in the AQUAPANEL® Joint Filler – grey.

Coverage:
approx. 2.1 m/m²
Packaging:
33 cm wide rolls, 50 m long

AQUAPANEL® Exterior Basecoat

A Portland cement bound, synthetic resin-enhanced basecoat. AQUAPANEL® Exterior Basecoat serves as complete basecoat on AQUAPANEL® Cement Board Outdoor.



Coverage:
approx. 7.8 kg/m²
Minimum layer thickness 5 mm
Packaging:
25 kg/bag

AQUAPANEL® Betocoat Acrylic Polymer Compound

AQUAPANEL® Betocoat is an acrylic polymer compound which is combined with Portland cement to make a basecoat.



Coverage:
As a basecoat, when mixed 1:1 by volume with Portland cement, approx. 3,6 kg/m² (Betocoat) (minimum layer thickness 5 mm)
Packaging:
15 kg pail

AQUAPANEL® Exterior Reinforcing Mesh

AQUAPANEL® Exterior Reinforcing Mesh is a wide-meshed, alkaline-resistant glass fabric mesh designed for complete cover reinforcement of AQUAPANEL® Exterior Basecoat in the exterior area.



Coverage:
1.1 m²/m²
Packaging:
100 cm wide rolls, 50 m long



AQUAPANEL® Exterior Primer

AQUAPANEL® Primer is a ready-to-use, white-coloured, water-based emulsion for priming basecoated substrates where AQUAPANEL® exterior finishes are used. It dries white and regulates the absorbency of the base.

Coverage:
approx. 100-150 g/m²
Packaging:
15 kg pail



AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white

AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white is a ready-to-use, pasty finishing plaster with a maximum grain size of 2 mm for applying on AQUAPANEL® Exterior Basecoat and AQUAPANEL® Exterior Primer. It is water-repellent and allows diffusion with $s_d > 0.1$ m.

Coverage:
3.1 kg/m²
Packaging:
25 kg pail

Note: AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white is available dyed.



AQUAPANEL® Exterior Dispersion Plaster – white

AQUAPANEL® Exterior Dispersion Plaster – white is a ready-to-use, pasty finishing plaster with a maximum grain size of 2 mm for applying on AQUAPANEL® Exterior Basecoat and AQUAPANEL® Exterior Primer. It is water-repellent and allows diffusion with $s_d > 0.5$ m.

Coverage:
3.1 kg/m²
Packaging:
25 kg pail

Note: AQUAPANEL® Exterior Dispersion Plaster – white is available dyed.



AQUAPANEL® Tyvek® StuccoWrap™ (for water-managed systems)

AQUAPANEL® Tyvek® StuccoWrap™ is a special climatic membrane made of very fine fibres with a coarse crêpe structure. This climatic membrane is a water barrier from the outside to the inside and allows vapour diffusion from the inside to the outside. Due to its structure, AQUAPANEL® Tyvek® StuccoWrap™ is optimally suited to the requirements of AQUAPANEL®

Cement Board Outdoor in water-managed (directly-applied) systems. It is installed as a water-carrying layer directly behind the board layer.

Coverage:
1.1 m²/m²
Packaging:
150 cm wide rolls, 75 m long

Ceilings:

ved accessories

Approved accessories



AQUAPANEL® Cement Board Outdoor

Cement board with a Portland cement and aggregate core, with coated glass fibre mesh embedded in back and front surfaces. Ends are square cut and edges are reinforced and finished smoothly (the EasyEdge™).

Thickness: 12.5 mm
Width: 900 mm
Length: 1200, 2400, 1250, 2500 mm
Weight: approx. 16 kg/m²
Packaging:
Length 1200, 1250 mm:
50 pieces per pallet
Length 2400, 2500 mm:
25 pieces per pallet



AQUAPANEL® Maxi Screw SN 39 AQUAPANEL® Maxi Screw SN 25 AQUAPANEL® Maxi Screw SN 55

AQUAPANEL® Maxi Screw SN has been specially developed for fixing AQUAPANEL® Cement Board on to timber and metal frameworks (metal thickness from 0.6 to 0.7 mm). These screws have a needle point and a countersink. They have a special corrosion-proof coating, which gives a guaranteed 500 hours corrosion resistance in a salt spray test.

AQUAPANEL® Maxi Screw SN 39 is suitable for a single or double layer boards on a metal framework or a single-layer panel on a wooden framework.

AQUAPANEL® Maxi Screw SN 25 can be used for a single-layer panel on a metal framework.

AQUAPANEL® Maxi Screw SN 55 can be used for a double layer of boards on a wooden framework or for a triple layer of boards on a metal framework.

Coverage:
25 pieces/m², profile spacing 300/312.5 mm
Packaging:
AQUAPANEL® Maxi Screw SN 39:
500 pieces/pack
AQUAPANEL® Maxi Screw SN 25:
1000 pieces/pack
AQUAPANEL® Maxi Screw SN 55:
250 pieces/pack
Collated screws available on request.



AQUAPANEL® Maxi Screw SB 39 AQUAPANEL® Maxi Screw SB 25

AQUAPANEL® Maxi Screw SB has been specially developed for fixing AQUAPANEL® Cement Board on to metal frameworks (metal thickness from 0.8 to 2 mm). The screws have a drill point and a countersink. They have a special corrosion-proof coating, which gives a guaranteed 500 hours corrosion resistance in a salt spray test.

AQUAPANEL® Maxi Screw SB 39 is suitable for a single or double layer of boards.

AQUAPANEL® Maxi Screw SB 25 can be used for a single layer of boards.

Coverage:
25 pieces/m², profile spacing 300/312.5 mm
Packaging:
AQUAPANEL® Maxi Screw SB 39:
250 pieces/pack
AQUAPANEL® Maxi Screw SB 25:
250 pieces/pack
Collated screws available on request.



AQUAPANEL® Rustproofed Screw SN 40

AQUAPANEL® Rustproofed Screws SN 40 have been specially developed for fixing AQUAPANEL® Cement Board Outdoor on to timber substructures. The screw length is 40 mm. The screws are manufactured from stainless steel.

Coverage:
25 pcs./m², profile spacing 300/312.5 mm
Packaging:
AQUAPANEL® Rustproofed Screws SN 40:
250 pieces/pack



AQUAPANEL® Joint Filler – grey

AQUAPANEL® Joint Filler – grey is a cement-bound filling material for filling joints and embedding AQUAPANEL® Tape (10 cm).

Coverage:
approx. 0.7 kg/m²
Packaging:
10 kg/bag

Product range



AQUAPANEL® Tape (10 cm)

AQUAPANEL® Tape (10 cm) is a glass fibre tape with an alkali-resistant coating. It is used to reinforce exterior joints. It is embedded in the AQUAPANEL® Joint Filler – grey.

Coverage:
approx. 2.1 m/m²
Packaging:
10 cm wide rolls, 50 m long



AQUAPANEL® Interior Primer

AQUAPANEL® Interior Primer is a solvent-free water-based dispersion for priming the AQUAPANEL® Cement Board. It provides maximum adhesion for the base to take a full-surface skim coating with AQUAPANEL® Joint Filler and Skim Coating – white.

Coverage:
approx. 40 - 60 g/m²
Packaging:
15 kg pail
2.5 kg pail



AQUAPANEL® Joint Filler and Skim Coating – white

AQUAPANEL® Joint Filler and Skim Coating – white is a cement-bound material for full-surface skim coating of AQUAPANEL® Cement Board. AQUAPANEL® Exterior Reinforcing Mesh must be embedded.

Coverage:
approx. 3.5 kg/m²,
layer thickness 4 mm
Packaging: 10 kg/bag

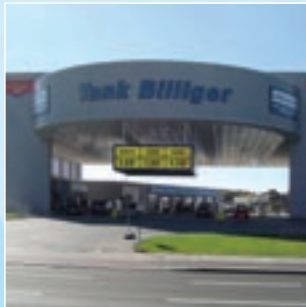
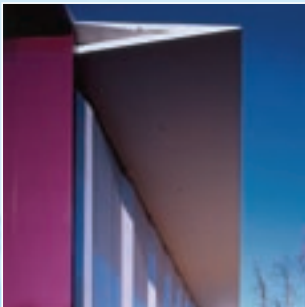


AQUAPANEL® Exterior Reinforcing Mesh

AQUAPANEL® Exterior Reinforcing Mesh is a wide-meshed, alkaline-resistant glass fabric mesh designed for complete cover reinforcement of AQUAPANEL® Joint Filler and Skim Coating – white in the exterior ceiling area.

Coverage:
1.1 m²/m²
Packaging:
100 cm wide rolls, 50 m long

Ideal for *outdoor* environments



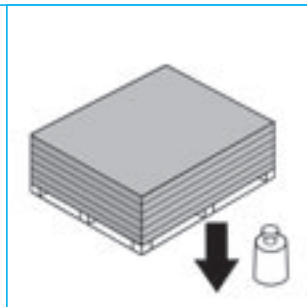
Processing and installation

Transportation and storage

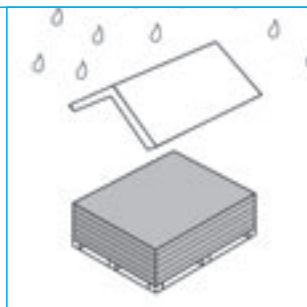
Always carry the boards upright, or use board rollers. Handle with fork lift or crane as palletted goods. Take care not to damage corners and edges when setting the boards down!



Ensure that the base is strong enough to support the boards. One pallet of AQUAPANEL® Cement Board Outdoor applies a weight of approximately 870 kg (8.7 kN).



Protect AQUAPANEL® Cement Board Outdoor from moisture and weathering before it is installed. Boards which have become damp must be dried on both sides on a flat surface prior to fitting.



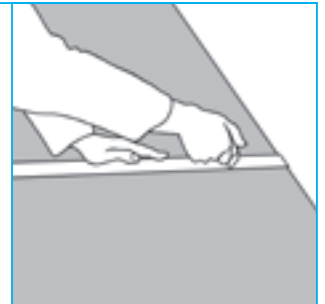
Installation

Before installing, condition the boards to the ambient temperature and humidity. The ambient air and component temperatures may not be below +5°C. Do not apply basecoat or finishing materials in temperatures less than +5°C.



Formatting

Mark the desired shape on the board with pencil and ruler. Use a knife to score the AQUAPANEL® Cement Board Outdoor on one side along the line so that the mesh is cut. Snap the scored edge and cut the mesh on the rear side.

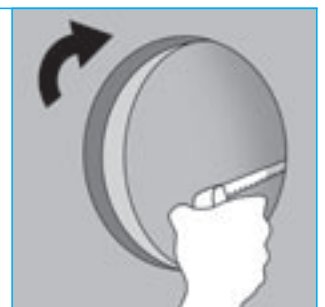


For sharp-edged cuts, for example, exterior edges, use a hand-held circular saw with a dust extractor or a pendulum jigsaw. Use of a carbide or diamond-tipped saw blade is recommended.



Cut-outs

To make cut-outs for wiring and pipes, use a jigsaw or keyhole saw. The diameter of the opening should be approximately 10 mm greater than the diameter of the pipe. The remaining gap can be closed with a cuff, suitable sealant or sealing strip.



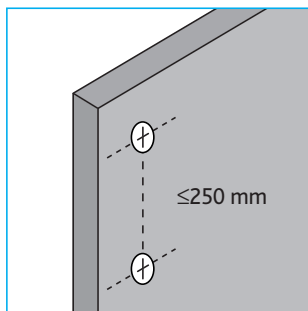
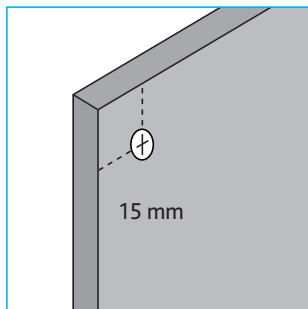
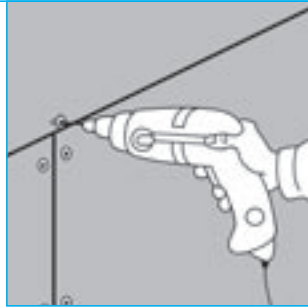
Installation with screws

Fasten AQUAPANEL® Cement Board Outdoor to the framework with AQUAPANEL® Maxi screws. As appropriate, use AQUAPANEL® Rustproofed Screws to attach the boards to the wooden supporting frame. First fasten the screws into the centre of the cement boards; then work towards the ends and the edges. During installation, make sure the cement boards are resting on the framework.

Screw spacing ≤ 250 mm.
Spacing from edge ≥ 15 mm.

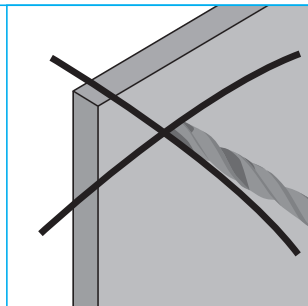
Screws should not be overtightened.

Note: Please observe a gap of 3 – 5 mm between the boards



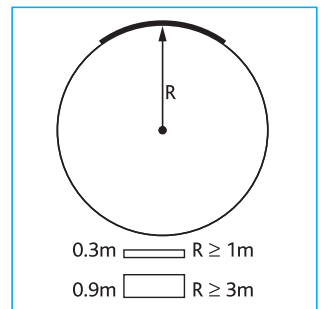
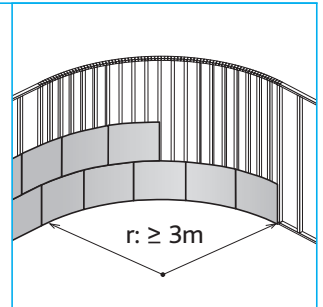
No predrilling required

Screw points are indicated by small crosses on the cement board itself.



Curved wall and façade constructions

AQUAPANEL® Cement Board Outdoor is ideally suited for applications such as arches and curved walls. These must be pre-formed dry before installing the boards. Before installation, bend the cement board panel. The fine cracks that occur on the board surface will not cause any loss of performance. Install the framework (relevant curved shape) to take the pre-formed AQUAPANEL® Cement Board Outdoor. For small radii, we recommend the additional installation of studs and support sections. A distance of no more than 300/312.5 mm should be chosen for the studs or support sections. The radii of curvature of AQUAPANEL® Cement Board are possible up to determined radii of the overall construction.

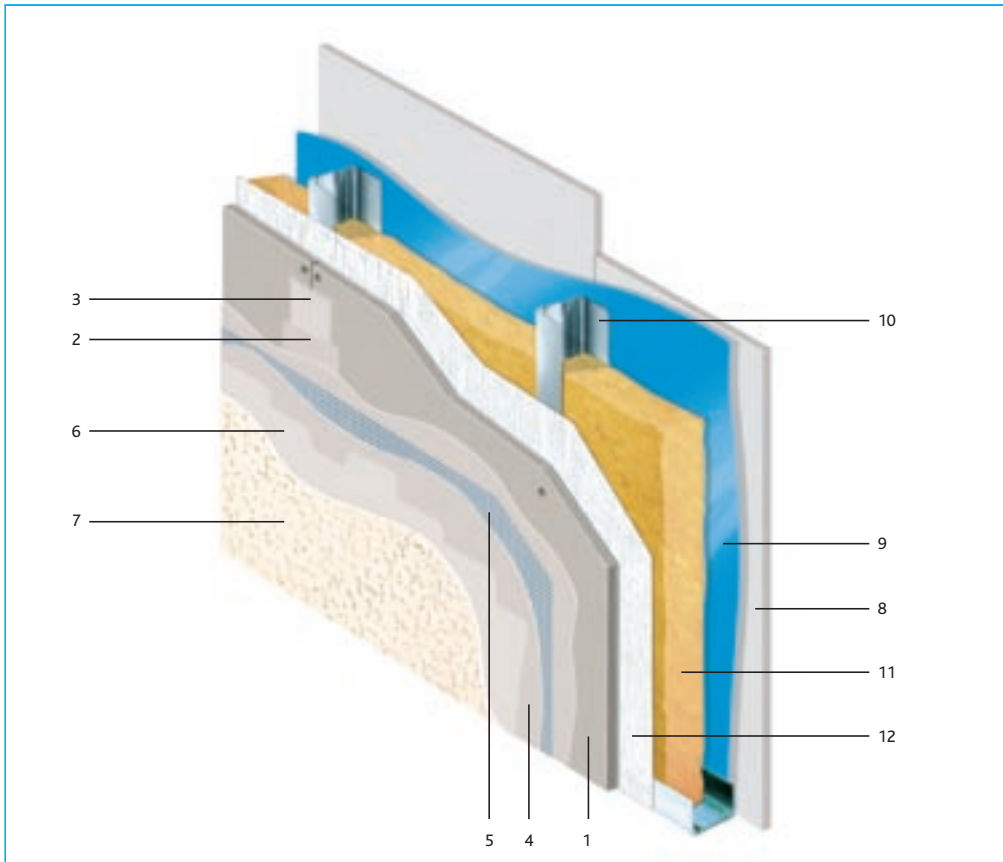


Board size:
1200/2400/1250/2500 x 900 mm
Minimum bending radius ≥ 3 m
Strip size*:
1200/2400/1250/2500 x 300 mm
Minimum bending radius ≥ 1 m

* You have to cut these strips to size yourself.

Water-managed system (directly-applied)

Installation



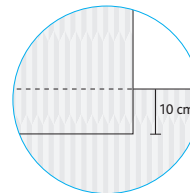
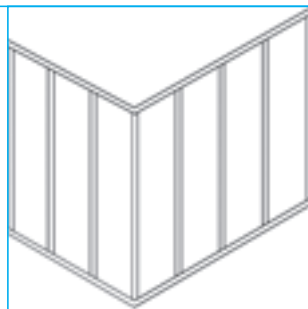
Key

- 1 AQUAPANEL® Cement Board Outdoor
- 2 AQUAPANEL® Joint Filler – grey
- 3 AQUAPANEL® Tape (10 cm)
- 4 AQUAPANEL® Exterior Basecoat
- 5 AQUAPANEL® Exterior Reinforcing Mesh
- 6 AQUAPANEL® Exterior Primer
- 7 AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white
- 8 Knauf gypsum board
- 9 Vapour barrier
- 10 Framework
- 11 Insulation
- 12 AQUAPANEL® Tyvek® StuccoWrap™

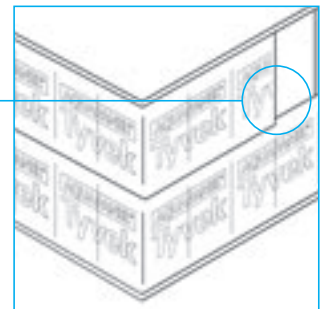
Installation – water-managed system

1. Create substructure

The steel or timber framework must be designed according to the static requirements of the construction. The centre distance of the substructure is a maximum of 600/625 mm o.c. in this case.

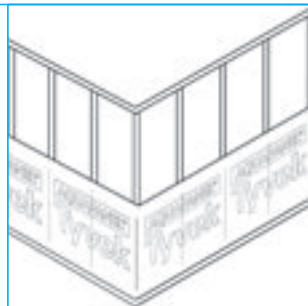


A minimum overlap of 10 cm is marked on the AQUAPANEL® Tyvek® StuccoWrap™.



2. Attaching AQUAPANEL® Tyvek® StuccoWrap™

2.1 A water barrier is required behind cement board in this application. Use AQUAPANEL® Tyvek® StuccoWrap™ as the water barrier. When installing this, start at the foot of the wall and install the water barrier in a shingle lap manner. Overlap all horizontal and vertical joints a minimum of 10 cm.



2.2 Secure the water barrier membrane with adhesive tape or adhesive and immediately apply AQUAPANEL® Cement Board Outdoor panels.

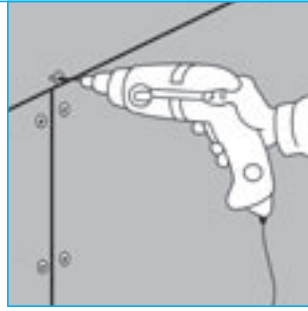


Installation guide

3. Installation with screws

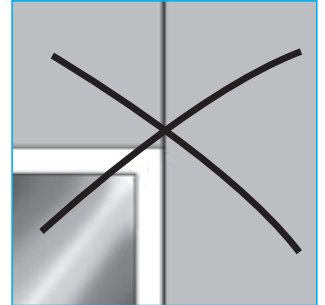
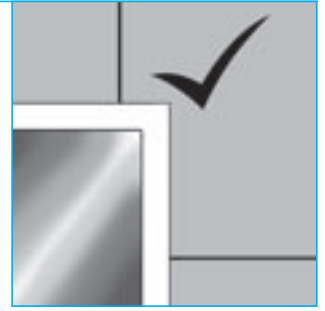
The AQUAPANEL® Cement Board Outdoor boards are attached with AQUAPANEL® Maxi screws onto the metal or timber supporting frame. Where appropriate, AQUAPANEL® Rustproofed Screws are to be used to attach the boards to the wooden framework. First fasten the screws into the centre of the cement boards; then work towards the ends and the edges. When installing, make sure the cement boards rest on the framework.

Screws should not be overtightened.



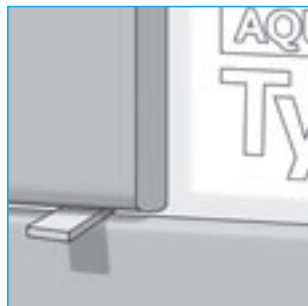
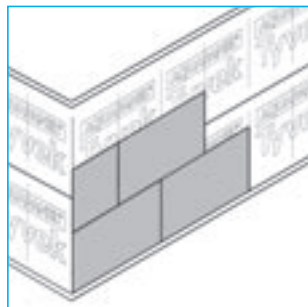
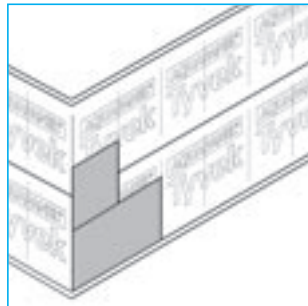
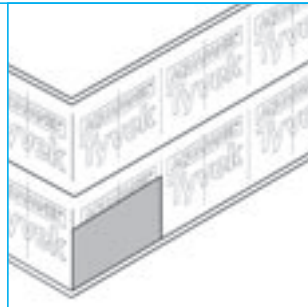
Screw spacing ≤ 250 mm.
Space from the edges ≥ 15 mm.

4.2 Take the boards up to the window and down to the window ledge. There must be no continuous joints as these could lead to tears and leaks.



4. Arrangement of boards

4.1 Apply AQUAPANEL® Cement Board Outdoor panels horizontally with ends over framework. Leave a gap of 3-5 mm between boards using a suitable spacer. When fitting the subsequent rows of boards, ensure that the vertical joints are offset a minimum of one stud cavity.



5. Joint treatment

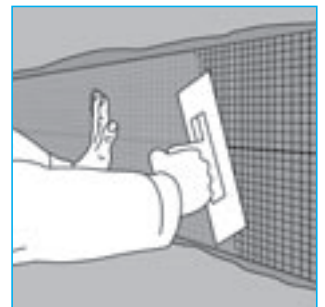
5.1 Immediately after assembly, protect the framework from weathering by filling all the joints with AQUAPANEL® Joint Filler – grey.



5.2A Immediately embed AQUAPANEL® Tape (10 cm) centred over all joints.



5.2B If only one coat of paint is to be applied onto AQUAPANEL® Exterior Basecoat, use AQUAPANEL® Exterior Reinforcing Tape which has a width of 33 cm.



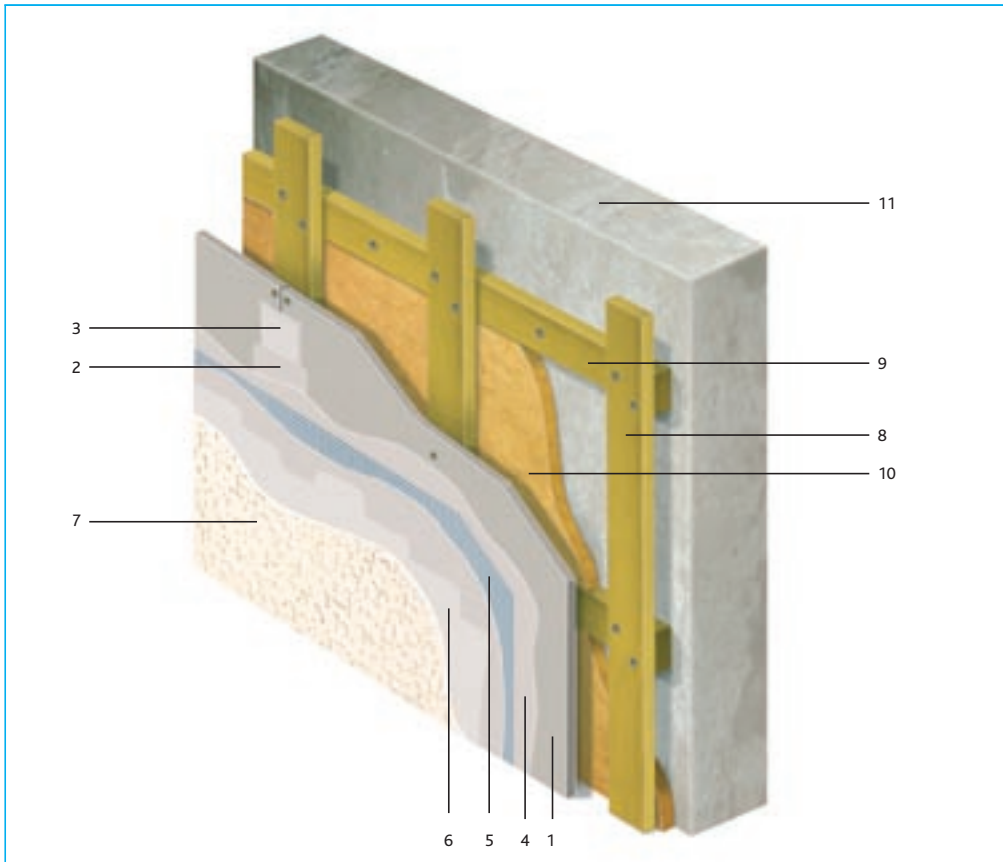
5.3 Fill the screw heads with AQUAPANEL® Joint Filler – grey.

Notes on preparing the surface for finishing can be found in the information on page 17.



Ventilated system

Installation



Key

- 1 AQUAPANEL® Cement Board Outdoor
- 2 AQUAPANEL® Joint Filler – grey
- 3 AQUAPANEL® Tape (10 cm)
- 4 AQUAPANEL® Exterior Basecoat
- 5 AQUAPANEL® Exterior Reinforcing Mesh
- 6 AQUAPANEL® Exterior Primer
- 7 AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white
- 8 Supporting battens
- 9 Basic laths
- 10 Insulation
- 11 Rigid substructure

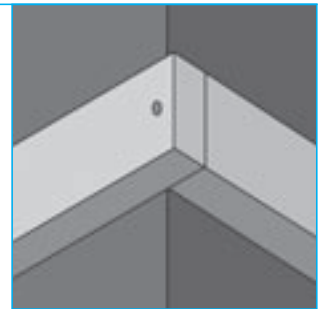
Installation – ventilated system

1. Installation when using battens

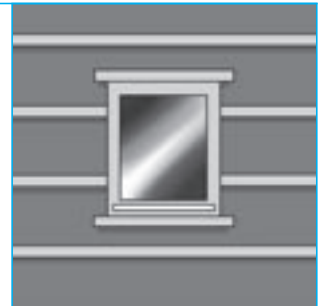
1.1 Anchor the horizontal battens using a sufficient quantity of suitable anchors in the base. The battens should have a minimum cross-section of 24 x 60 mm. To increase the heat insulation of the construction, the space between the battens can be filled with a waterproof heat insulation material.



1.2 In the corners, overlap and screw the base battens.



1.3 Fit battens around openings (e.g. windows) to fix cement boards. Additional battens must always be provided over and under the building work openings.

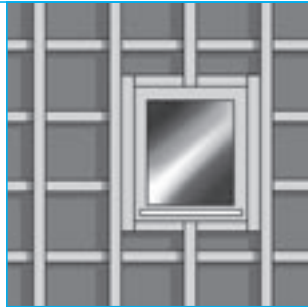


2. Applying the laths

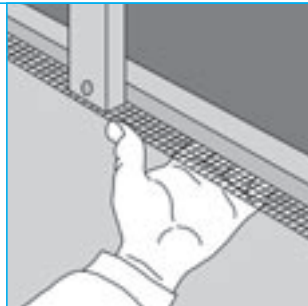
2.1 After anchoring the battens, mount supporting laths at a distance between centres of 600/625 mm. To ensure sufficient edge gaps, in particular at the ends of boards, use pieces of wood with a minimum cross-section 24 x 80 mm.



2.2 Surround the openings with extra laths, in addition to the battens.



2.3 Attach a ventilation section at the top and bottom of the construction. This is to protect the rear ventilation gap from being entered by pests, insects and small animals.



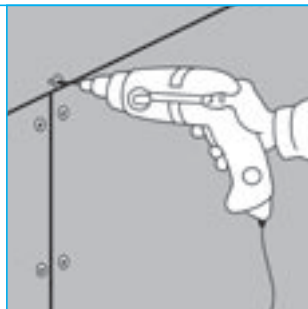
3. Installing AQUAPANEL® Cement Board Outdoor

Installation with Screws:

3.1 Fasten AQUAPANEL® Cement Board Outdoor to the framework using AQUAPANEL® Maxi Screws. Use AQUAPANEL® Rustproofed Screws to fix the boards to the timber framework, according to local standards. Drive fasteners into the centre of the cement board first, working towards ends and edges. When fastening, ensure that the cement boards rest on the framework.

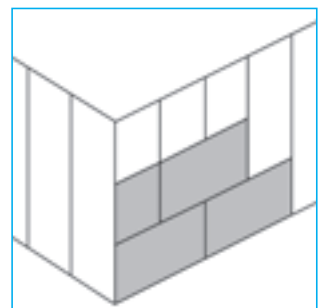
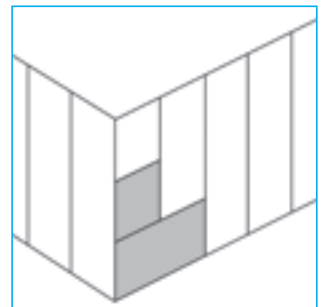
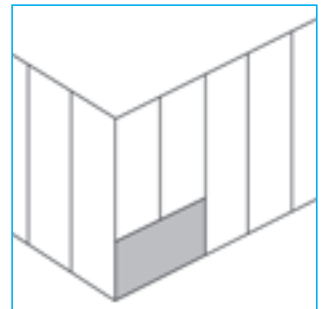
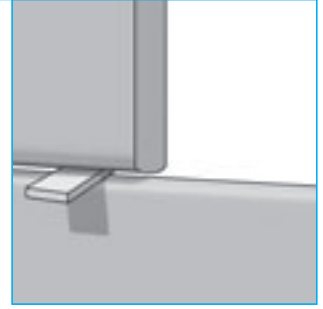
Screw spacing \leq 250 mm.
Spacing from the edges \geq 15 mm.

Screws should not be overtightened.

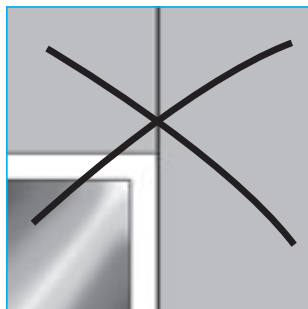
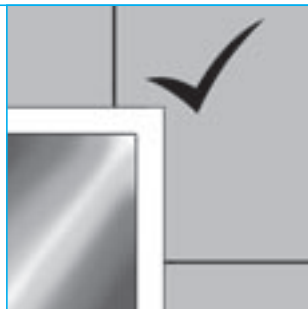


Arrangement of boards:

3.2 Attach AQUAPANEL® Cement Board Outdoor panels horizontally with ends over supports. Make sure there is a planned gap of 3-5 mm between the boards. To do this, make a gap between successive horizontal cement boards using a suitable spacer. When fitting subsequent rows of boards, ensure that the vertical joints are offset a minimum of one stud cavity, thus avoiding cross joints.



3.3 Take the boards up to the window sill and down to the window ledge. There must be no continuous joints as these could lead to leaks and tears.



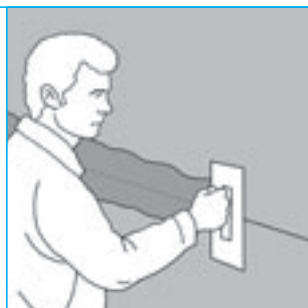
4.3 Fill the screw heads with AQUAPANEL® Joint Filler – grey.

Notes on preparing the surface for finishing can be found in the information on page 17.

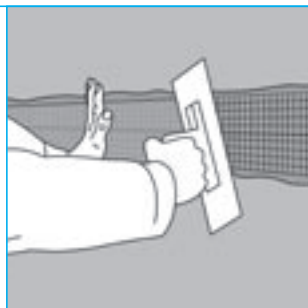


4. Joint treatment

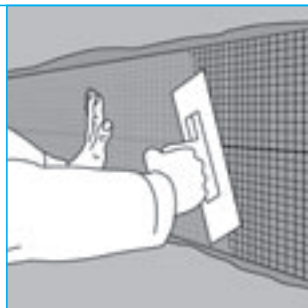
4.1 Immediately after assembly, protect the framework from weathering by filling all the joints with AQUAPANEL® Joint Filler – grey.



4.2A Immediately embed AQUAPANEL® Tape (10 cm) centred over all joints.



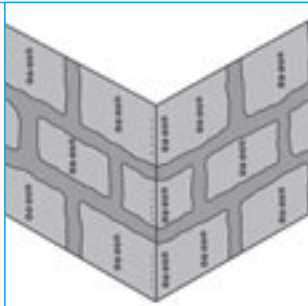
4.2B If only one coat of paint is to be applied onto AQUAPANEL® Exterior Basecoat, use AQUAPANEL® Exterior Reinforcing Tape (33 cm) instead of AQUAPANEL® Tape (10 cm).



Finishing

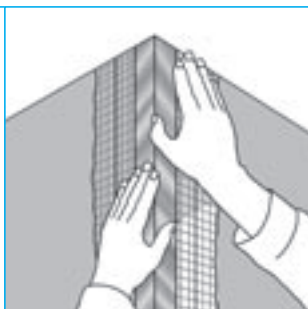
In the systems shown, AQUAPANEL® Cement Board Outdoor is used as a support for plaster. This is because when AQUAPANEL® Cement Board Outdoor is used in a water-managed or ventilated system, there is a need for finishing with a plaster system.

By this stage, joints have been treated with AQUAPANEL® Joint Filler – grey and AQUAPANEL® Tape (10 cm) has been embedded. Screw heads have been covered with AQUAPANEL® Joint Filler – grey.



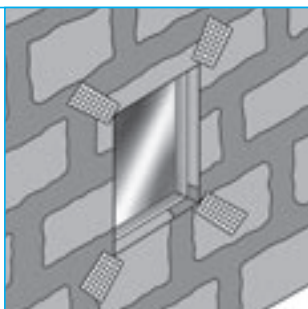
Reinforcing corners

Corners are reinforced by applying AQUAPANEL® Exterior Basecoat. To protect the corners, place a corner profile using the AQUAPANEL® Exterior Basecoat.



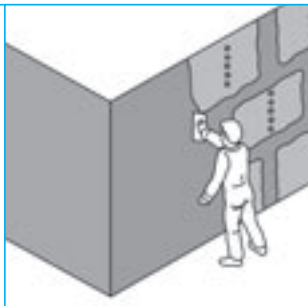
Windows and door openings only

Reinforce window corners with extra pieces of AQUAPANEL® Exterior Reinforcing Mesh, size 50 x 30 cm, applied as shown.



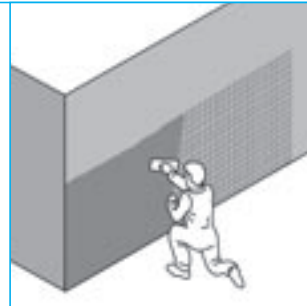
Applying the basecoat layer

Cover entire wall with AQUAPANEL® Exterior Basecoat. This is applied by hand using a trowel or by machine (machine recommendation: mixing pump PFT G4 or G5, rotor/stator D4-3, half power, water requirement 200 l/h). Alternatively, AQUAPANEL® Betocoat can also be used as a basecoat layer.



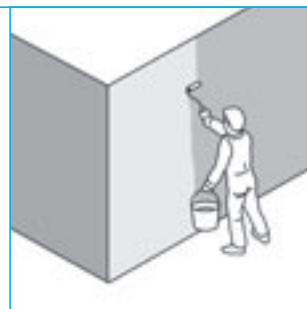
Embed exterior reinforcing mesh

Embed AQUAPANEL® Exterior Reinforcing Mesh over the entire surface, pushing into the basecoat to about one third of the depth. The thickness of the mesh-reinforced basecoat should be 5-7 mm. Before continuing with the next steps, allow a drying time of 1 day per mm of layer thickness.



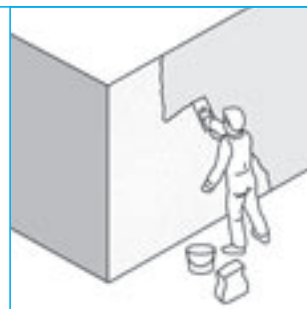
Prime the surface

Apply AQUAPANEL® Exterior Primer over the entire surface on top of the AQUAPANEL® Exterior Basecoat. When using coloured finishing plaster, you can match AQUAPANEL® Exterior Primer to the colour of the finishing plaster with dispersion full colour paints. Leave for at least 24 hours between priming and finishing plaster. The primer must be completely dry.

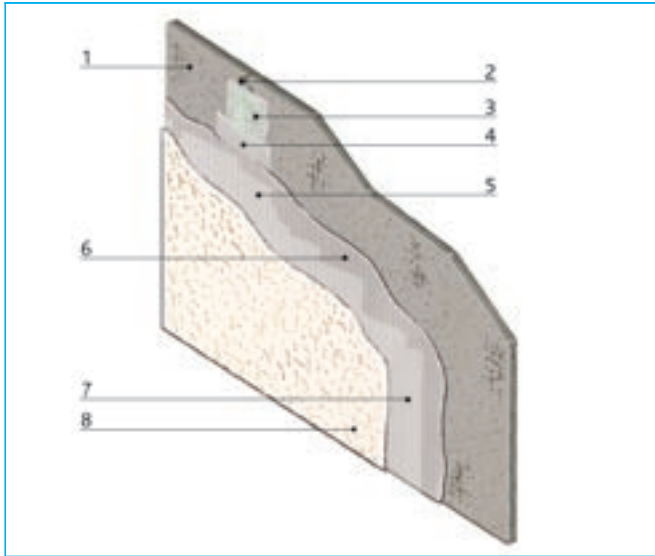


Apply exterior finish

Apply AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white on top of the primed surface. This can be done manually or by machine (machine recommendation: mobile feed pump with FU, PFT swing or N2V). Ensure that the contents of the bucket are mixed thoroughly. The finishing plaster is skimmed to grain size and then structured.



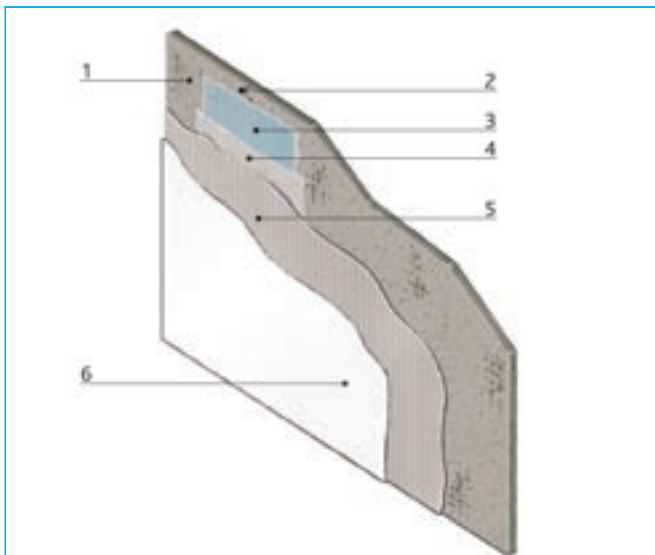
Coating



Exterior system with textured finish

- 1 AQUAPANEL® Cement Board Outdoor
- 2 AQUAPANEL® Maxi Screw / AQUAPANEL® Rustproofed Screw
- 3 AQUAPANEL® Tape (10 cm)
- 4 AQUAPANEL® Joint Filler – grey
- 5 AQUAPANEL® Exterior Basecoat
- 6 AQUAPANEL® Exterior Reinforcing Mesh
- 7 AQUAPANEL® Exterior Primer
- 8 AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white

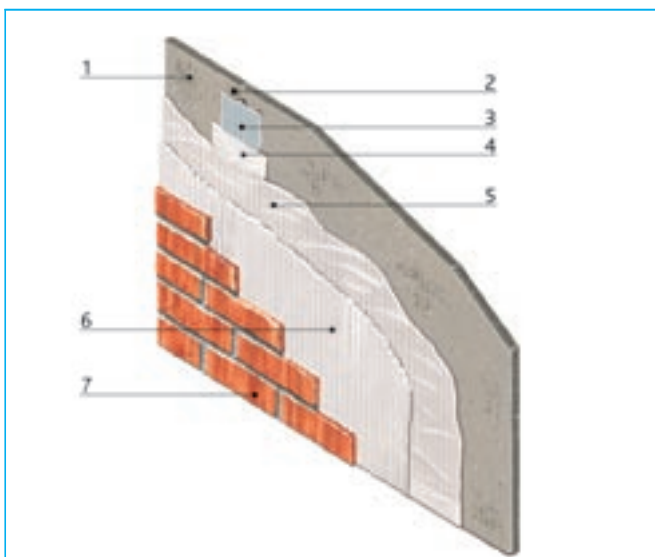
AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white can be supplied by the factory in various colours (colour reference value of H \geq 40%).



Exterior system with paint finish

- 1 AQUAPANEL® Cement Board Outdoor
- 2 AQUAPANEL® Maxi Screw / AQUAPANEL® Rustproofed Screw
- 3 AQUAPANEL® Exterior Reinforcing Tape (33 cm)
- 4 AQUAPANEL® Joint Filler – grey
- 5 AQUAPANEL® Exterior Basecoat with AQUAPANEL® Exterior Reinforcing Mesh embedded
- 6 Paint system

Note: For information on colour systems, refer to recommendations and regulations of the manufacturer. For the exact shade, select a colour reference value of H \geq 40%.



Exterior system with thin brick finish or ceramic covering

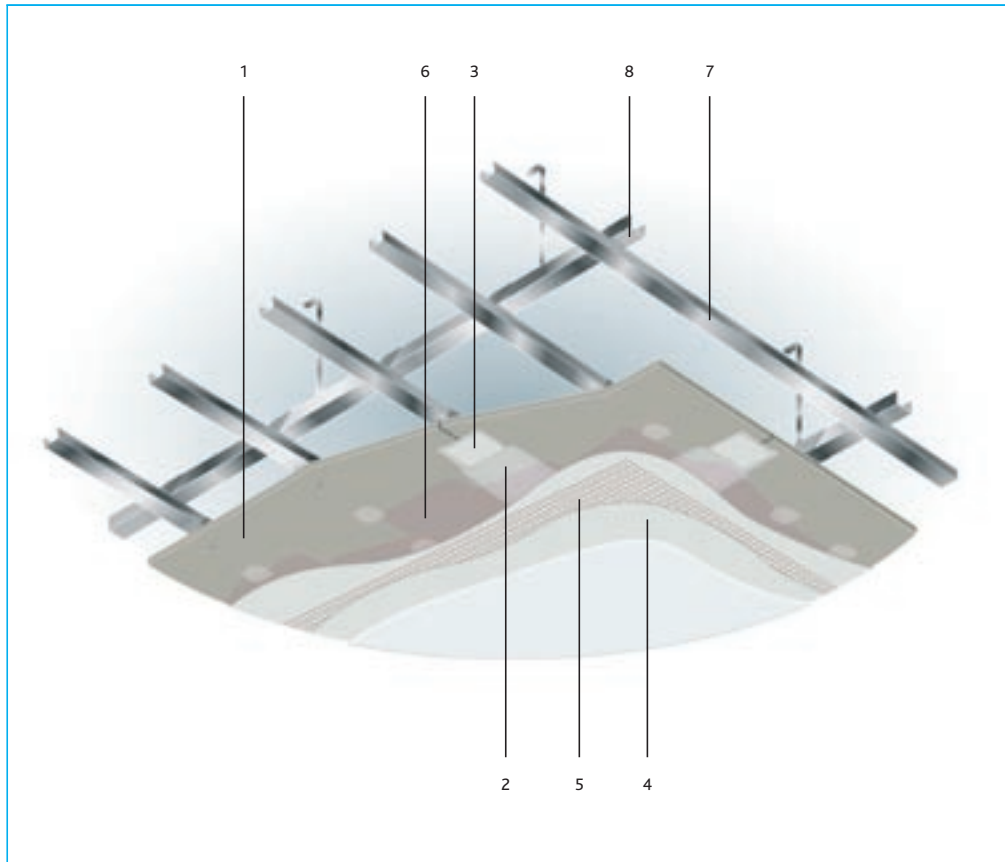
- 1 AQUAPANEL® Cement Board Outdoor
- 2 AQUAPANEL® Maxi Screw / AQUAPANEL® Rustproofed Screw
- 3 AQUAPANEL® Tape (10 cm)
- 4 AQUAPANEL® Joint Filler – grey
- 5 AQUAPANEL® Exterior Basecoat with AQUAPANEL® Exterior Reinforcing Mesh embedded
- 6 Flexible adhesive
- 7 Thin brick or ceramic covering

Glue the brick or ceramic covering in frost-free conditions using a frost-proof process. Select suitable adhesives according to manufacturers' recommendations for cement bases.

Note: For thin brick application, the maximum permitted load of tiling including adhesive is 40 kg per square metre. The max. dimension is limited by 33 to 33 [cm]. Contact Knauf USG Systems if the load or dimension is higher.

Installation of ceilings

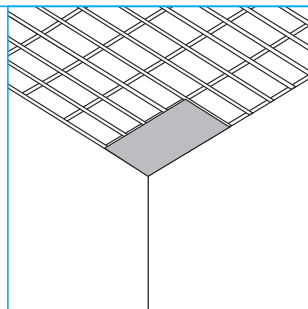
Installation



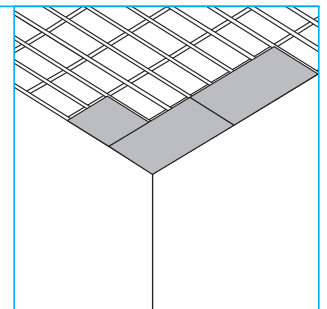
- Key**
- 1 AQUAPANEL® Cement Board Outdoor
 - 2 AQUAPANEL® Joint Filler – grey
 - 3 AQUAPANEL® Tape (10 cm)
 - 4 AQUAPANEL® Joint Filler and Skim Coating – white
 - 5 AQUAPANEL® Exterior Reinforcing Mesh
 - 6 AQUAPANEL® Interior Primer
 - 7 Supporting profile
 - 8 Foundation profile

Installation of ceilings

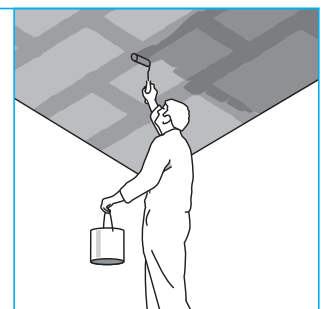
Align the first AQUAPANEL® Cement Board Outdoor panel carefully, perpendicular to the supporting profile. Screw the panel to the framework using AQUAPANEL® Maxi Screws (material requirement 25 pcs/m²). The gap between the supporting profiles is a maximum of 300/312.5 mm. As appropriate, use AQUAPANEL® Rustproofed Screws for attaching the boards to a timber framework.



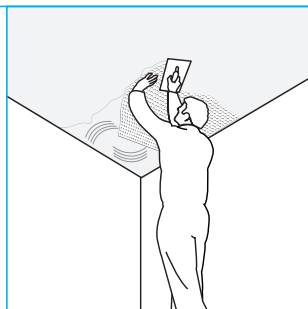
Leave a gap between joints of at least 3-5 mm. Make sure all joints are staggered. Cross joints are not permitted. After installation, fill in all joints with AQUAPANEL® Joint Filler – grey and embed the AQUAPANEL® Tape (10 cm) into the filler. Fill all screw heads.



Prime the surface all over using AQUAPANEL® Interior Primer (primer/water 1:2).



Apply AQUAPANEL® Joint Filler and Skim Coating – white over the entire area to coat the panels with an average thickness of 4 mm. Embed the AQUAPANEL® Exterior Reinforcing Mesh into the entire surface, pushing the mesh in to about a third of the depth of the AQUAPANEL® Joint Filler and Skim Coating – white.



Substructure:

The hangers of the ceiling construction must be stiffened and, where required in individual cases, they should be secured against buckling by sufficient design measures. The anchoring of hangers to the primary construction must be done using sufficient suitable ceiling pins according to the relevant base. Use ceiling pins approved by your local building authority for this purpose.

Expansion Joints:

We recommend that expansion joints are included at maximum 15 m intervals. Align with the expansion joints in the background if practical. Special ceiling geometries, e.g. highly angled ceiling surfaces, may, in individual cases, require a narrower arrangement of expansion joints.

Stability and construction

Stability

In addition to their inherent weight, façades and ceilings in exterior applications are loaded primarily by the effect of wind, depending on the height and geometry of the building. The dimensions and cross-sections of the substructure must be matched to the effects of wind pressure and wind suction. In individual cases, a factor for snow and ice loads is also necessary. The serviceability of the individual elements of the substructure must be technically demonstrated. Proof of fitness for use is shown by a deformation limit of max. $f=l/500$. For proof of components, the relevant norms and standards should be considered.

Material selection and corrosion protection

Façades and ceilings in exterior applications are designed to resist changing weather conditions. A suitable material must be selected for the substructure, depending on moisture loading. As well as a wooden substructure, metal substructure kits are available. For metal substructure kits, it is important to observe sufficient corrosion protection. Where different materials are being combined, compatibility must be checked in each case. For substructure kits of cold-formed galvanised sections with associated stamped parts, refer to EN 13964. It is up to the specialist planner to set the relevant moisture loads and resulting corrosion protection classes.

Anchoring, fastenings and connectors

The effects on the façade resulting from wind, snow, ice and particular loads are dissipated in the load-bearing structure by the substructure and its anchorings, fastenings and connectors. In this, the components mentioned above fulfil the following functions.

• Anchorings:

Component which mechanically anchors the substructure to the ground.

• Fastenings:

Metallic component which mechanically fastens the cladding to the substructure.

• Connectors:

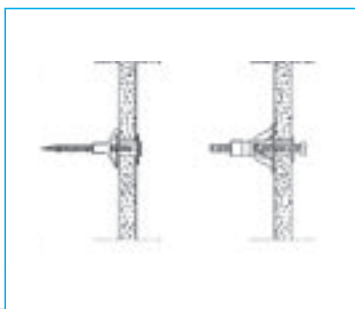
Metallic component which joins the substructure components to each other.

Particular loads on façades and ceilings

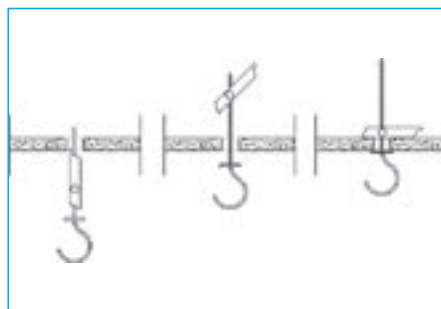
Particular loads, resulting, for example, from advertising hoardings, sunblinds etc. must to be carried independently of the AQUAPANEL® Cement Board Outdoor cladding into the load-bearing substructure or primary structure, as required, to observe proof of stability. Light loads, such as from the inherent weight of ornamental elements, decorative sections and lighting may be anchored into the AQUAPANEL® Cement Board Outdoor panels using at least two metal cavity wall plugs. The gap between the plugs must be at least 75 mm. For wall constructions, the size of the light load is restricted to a maximum of 25 kg. For ceiling constructions, this is a maximum of 10 kg. For both constructions, individually occurring, non-plane point loads are meant.

Plug load capacity (kg) under tension and shear

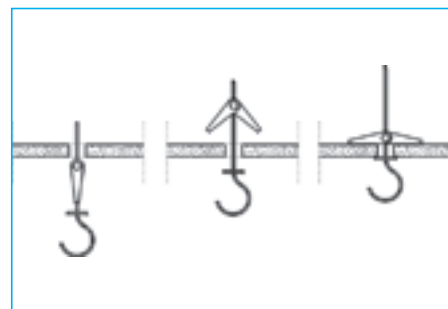
| Panel thickness mm | Plastic cavity wall plug Ø 8 or Ø 10 mm | Metal anchor screw M5 or M6 |
|-----------------------|--|--------------------------------|
| 1 x 12.5 | 25 kg | 30 kg |
| 2 x 12.5 | 40 kg | 50 kg |



Wall plug



Tilting ceiling hooks



Spring toggle ceiling hooks

Moisture protection

Moisture protection with AQUAPANEL® Cement Board Outdoor

Damp is the main cause of structural damage to buildings. Water seeps into the construction as

- Standing and flowing water
- Capillary moisture
- Condensation water
- High relative humidity

In many areas of the construction, the ability to withstand damp and water is critical for the quality and durability of a building component. The requirement for the ability to resist precipitation is particularly applicable in façade constructions. AQUAPANEL® Cement Board Outdoor is absolutely weather-resistant against all environmental effects of the weather. In addition as a façade building material. AQUAPANEL® Cement Board Outdoor brings the following damp protection properties:

- Water resistance and dimensional stability of material
- Resistance to mould formation
- Moisture vapour permeability for optimum indoor climate.

AQUAPANEL® Cement Board Outdoor is therefore the ideal building panel for exterior use, as proven by numerous trials and tests:



Water resistance characteristics of AQUAPANEL® Cement Board Outdoor

| Material Thickness | Weight | Raw Dry Density | Water diffusion resistance coefficient | S_d | Conductivity |
|--------------------|----------------------|------------------------|--|----------|--------------|
| 12.5 mm | 16 kg/m ² | 1150 kg/m ³ | $\mu = 19$ | 0.2375 m | 0.36 W/mK |

AQUAPANEL® Cement Board Outdoor is water-resistant. Under water loading, AQUAPANEL® Cement Board Outdoor displays extremely slight and system-safe changes in form. The cement board changes neither its structural composition nor its static properties.

AQUAPANEL® Cement Board Outdoor is resistant to mould growth and is therefore also suitable for use in areas where there is a high level of damp. This was confirmed by the Institute for Building Biology in Rosenheim in its report No. 3001 - 57.

AQUAPANEL® Cement Board Outdoor displays very good vapour diffusion behaviour for cementitious boards, with a diffusion resistance of $\mu = 19$. This ensures the cladding shows no vapour-blocking behaviour. This is of considerable importance for a built-up physically optimal layer composition, as highlighted by the Institute for Building Biology in Rosenheim in its report No. 3001 - 56.



Protection from damp

Fire protection

'The protection of people and goods from fire is the essential aim of fire protection.'

Preventative structural fire protection has to meet the following planning and construction requirements:

- Fire risk is reduced if as many non-flammable building materials as possible are used.
- In the event of a fire, people within the building must be able to leave the building safely.
- The construction must be such that it remains stable sufficiently long in the event of fire, and prevents spread of fire and smoke to other buildings or other parts of the building for long enough.

From these requirements comes the need to research building materials and components both structurally and technically for their applicable fire behaviour and ability to protect against fire. Each building material is given a building material classification according to how it behaves during a fire. AQUAPANEL® Cement Board Outdoor is classified as "non-combustible", building material class A1 in accordance with EN 13501.

The behaviour of AQUAPANEL® Cement Board Outdoor constructions in the event of a fire has been proven by extensive fire tests.

Before the formation of the European community, the tests took place according to national standards, e.g. according to DIN 4102. This brochure also contains constructions whose behaviour in case of fire is proven according to DIN 4102.

The fire resistance tests according to European standards are conducted to EN 1364 for non-load bearing components and to EN 1365 for load-bearing ones, in each case following EN 1363.

The fire resistance time of the tested AQUAPANEL® Cement Board Outdoor constructions extends, according to the type of construction, up to a maximum of ninety minutes and is indicated by a precise fire resistance classification for each component. Based on the classification designation, you can recognise whether the test was carried out according to national DIN 4102 or European standard. National tests use designations F or particularly W for non load-bearing external walls. The European standard uses different designations. The most important designations for the description of the performance criteria are given below, together with their meanings.

The following table shows the allocation of the fire grading periods according to DIN and EN.

Comparison of fire resistance classifications

Allocation of classes for fire resistance of construction components according to DIN 4102 and EN

| Building designation | Load-bearing construction | | Non-load bearing inner wall | Non-load bearing outer wall | Independent ceiling |
|--------------------------|----------------------------|-------------------------|-----------------------------|--|-------------------------------|
| | Without enclosure of space | With enclosure of space | | | |
| Fire-retardant | R 30 | REI 30 | EI 30 | E 30 (<i>i</i> → <i>o</i>) und EI 30 (<i>i</i> ← <i>o</i>) | EI 30 (<i>a</i> ↔ <i>b</i>) |
| | [F 30] | [F 30] | [F 30] | [W 30] | [F 30 from both directions] |
| Fire-resistant | R 60 | REI 60 | EI 60 | E 60 (<i>i</i> → <i>o</i>) und EI 60 (<i>i</i> ← <i>o</i>) | EI 60 (<i>a</i> ↔ <i>b</i>) |
| | [F 60] | [F 60] | [F 60] | [W 60] | [F 60 from both directions] |
| Fire-resistance 120 min. | R 90 | REI 90 | EI 90 | E 90 (<i>i</i> → <i>o</i>) und EI 90 (<i>i</i> ← <i>o</i>) | EI 90 (<i>a</i> ↔ <i>b</i>) |
| | [R 90] | [R 90] | [F 90] | [W 90] | [F 90 from both directions] |
| Firewall | R 120 | REI 120 | - | - | - |
| | [R 120] | [F 120] | - | - | - |
| Firewall | - | REI-M 90 | EI-M 90 | - | - |

Testing and classification must also only be carried out on one side. Independent of the test/tests performed, the classifications are described as follows:

i → *o*, when the intention is to classify from inside to outside;

i ← *o*, when the intention is to classify from outside to inside;

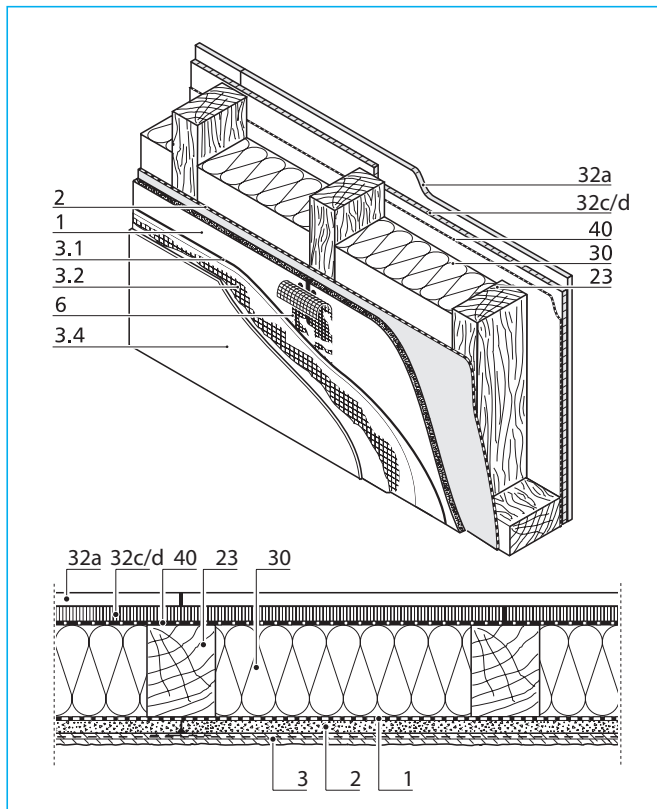
i ↔ *o*, when the intention is to classify from inside to outside and from outside to inside.

According to EN, the description of fire resistance is described by the following performance criteria:

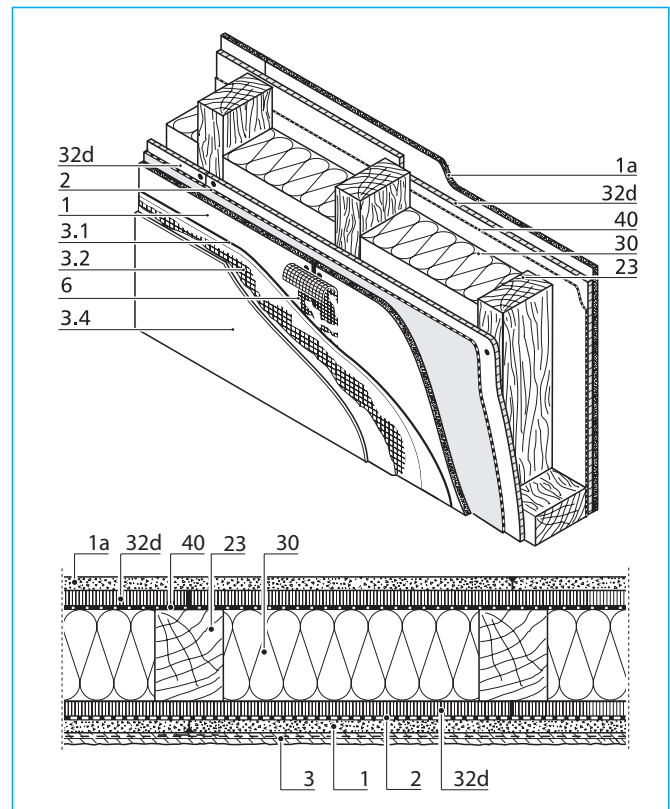
| Derivation of abbreviation | Criterion |
|------------------------------|--|
| R (Résistance - Strength) | Bearing capacity |
| E (Etanchéité - Seal) | Room sealing |
| I (Isolation - Insulation) | Heat insulation (under the effect of fire) |
| W (Radiation) | Limitation of radiation penetration |
| M (Mechanical) | Mechanical effect on walls (impact load) |
| <i>i</i> → <i>o</i> | Direction of classification of fire resistance |
| <i>i</i> ← <i>o</i> | |
| <i>i</i> ↔ <i>o</i> (in-out) | |

Water-managed exterior walls with timber framework

Load-bearing exterior wall without fire protection requirement and with F 30-B



Exterior wall without fire protection requirement



Exterior wall F 30-B

Construction

Exterior wall with timber framework

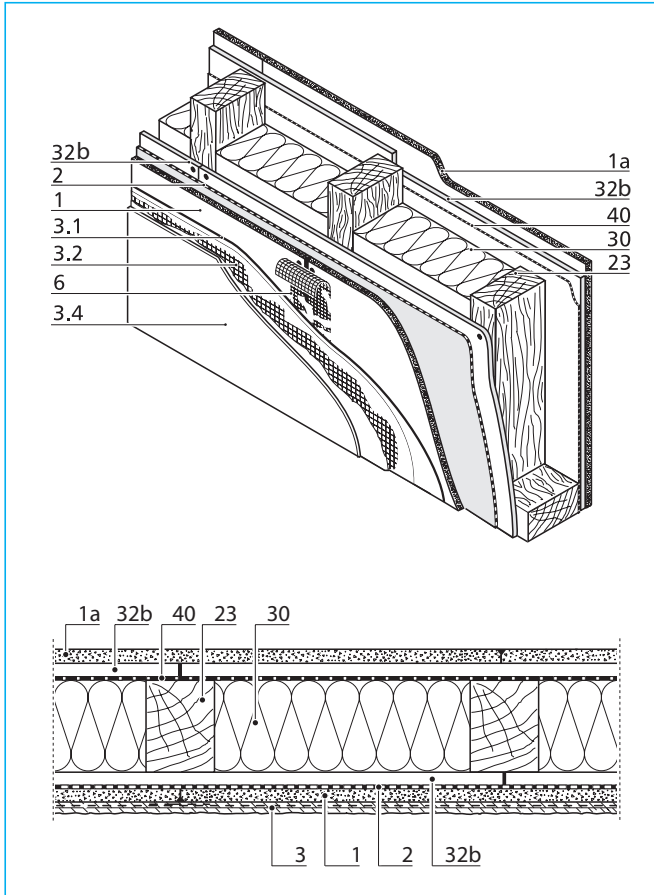
Exterior panelling of AQUAPANEL® Cement Board Outdoor attached with AQUAPANEL® Rustproofed Screws, AQUAPANEL® Tyvek® StuccoWrap™, timber framework, insulating material, vapour barrier or airtight track as required, interior panelling made up from Knauf boards, GKB or OSB board or Knauf Vidiwall gypsum fibre board.

Exterior Wall F 30-B:

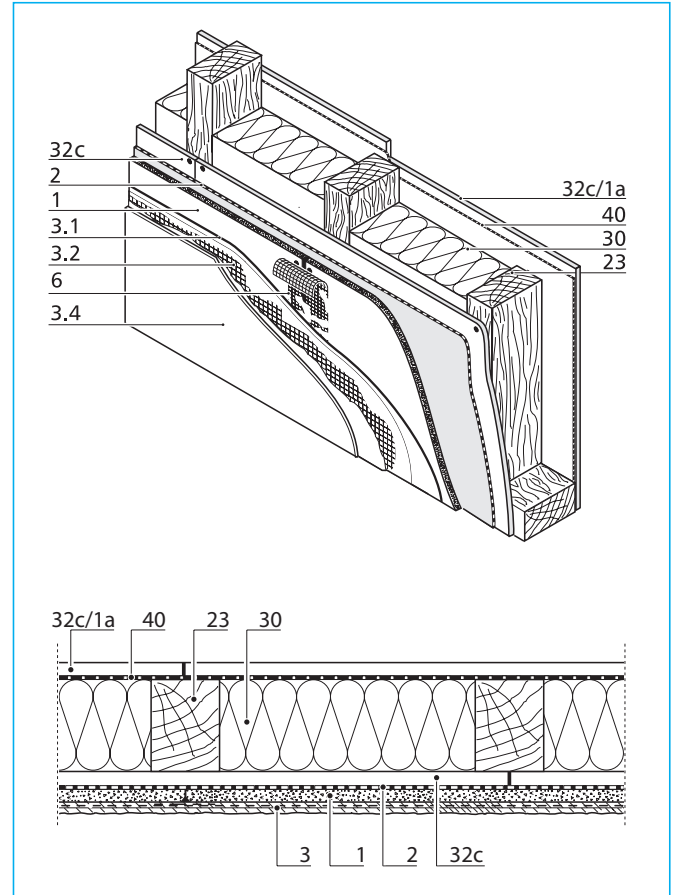
- External panelling of AQUAPANEL® Cement Board Outdoor with AQUAPANEL® Tyvek® StuccoWrap™ on OSB board, 15 mm
- Fastened with AQUAPANEL® Rustproofed Screws
- Timber framework 70 / 140 mm,
- Cellulose fibre insulating material 140 mm, 60 kg/m³ (e.g. Isofloc)
- Vapour barrier or airtight track as required
- Interior panelling of AQUAPANEL® Cement Board Indoor on OSB board, 15 mm
- Fire-resistance time F30-B to test certificate P - 3065 / 0559 - MPA Braunschweig.

An airtight layer may be incorporated, depending on the construction engineering circumstances.

Load-bearing exterior wall F 90-B and outer wall of building



Exterior wall F 90-B



Outer wall of building F 30-B interior/F 90-B exterior

Construction

Exterior wall F 90-B:

- Exterior panelling of AQUAPANEL® Cement Board Outdoor with AQUAPANEL® Tyvek® StuccoWrap™ on fire-resistant gypsum board, e.g. Knauf GKF, 12.5 mm
- Attached with suitable screws 4.5 x 80 mm for exterior use
- Vapour barrier or airtight track as required
- Interior panelling of AQUAPANEL® Cement Board Indoor on fire-resistant gypsum board, e.g. Knauf GKF, 12.5 mm
- Fire resistance time F 90-B to test certificate P - 3059 / 0499 MPA Braunschweig.

Key

- 1 AQUAPANEL® Cement Board Outdoor
- 1a AQUAPANEL® Cement Board Indoor
- 2 AQUAPANEL® Tyvek® StuccoWrap™
- 3 AQUAPANEL® plaster system
- 3.1 AQUAPANEL® Exterior Basecoat
- 3.2 AQUAPANEL® Exterior Reinforcing Mesh
- 3.3 AQUAPANEL® Exterior Primer
- 3.4 AQUAPANEL® Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white

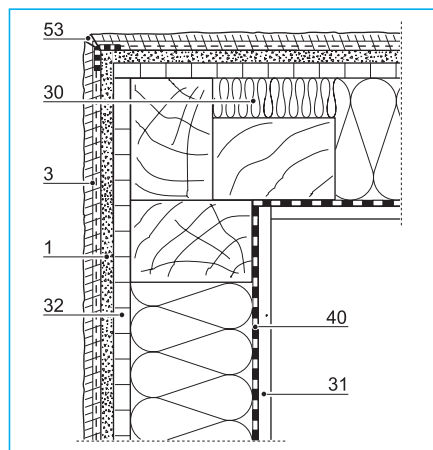
Outer wall

- External panelling of AQUAPANEL® Cement Board Outdoor with AQUAPANEL® Tyvek® StuccoWrap™ on gypsum fibre board, 15 mm, e.g. Knauf Vidiwall,
- Attached with suitable screws 5 x 70 mm BTI, type: SPS Drilltec ES 5.0 x 70 TX 25 for exterior use
- Timber framework 60 / 120 mm,
- Insulation with 120 mm mineral wool 40 kg/m³
- Vapour barrier or airtight track as required
- Interior panelling of gypsum fibre boards ≥ 12.5 mm, e.g. Knauf Vidiwall, or AQUAPANEL® Cement Board Indoor 12.5 mm
- Fire resistance time F 30-B interior / F 90-B exterior to test certificate P - 3500/6453 - MPA Braunschweig

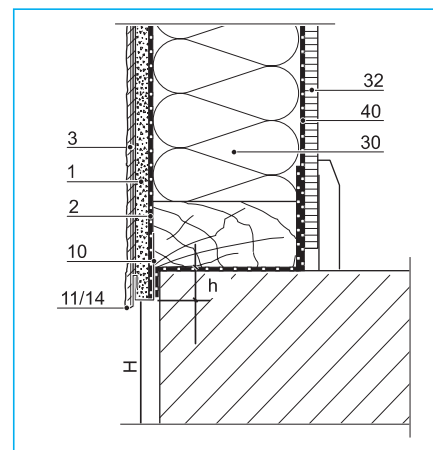
- 6 AQUAPANEL® Joint Filler – grey and AQUAPANEL® Tape (10 cm)
- 23 Timber framework
- 30 Insulating material, e.g. Knauf Insulation or Heraklith
- 32a Knauf Gypsum Board (GKB)
- 32b Knauf Fireboard (GKF)
- 32c Knauf Vidiwall (GF)
- 32d OSB board
- 40 Vapour barrier / airtight layer

Water-managed exterior walls with timber framework

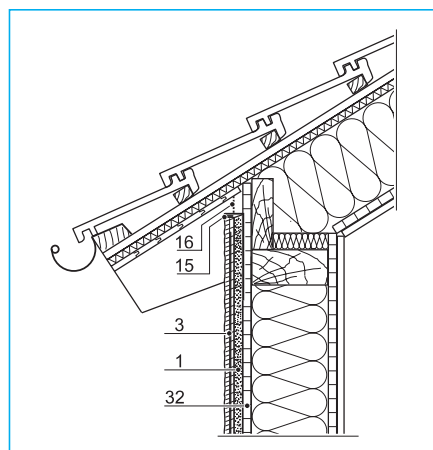
Details and construction examples



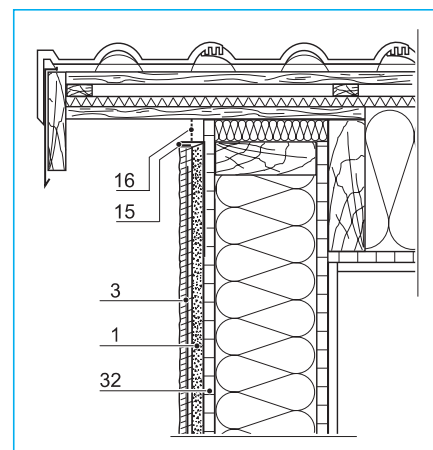
External corner



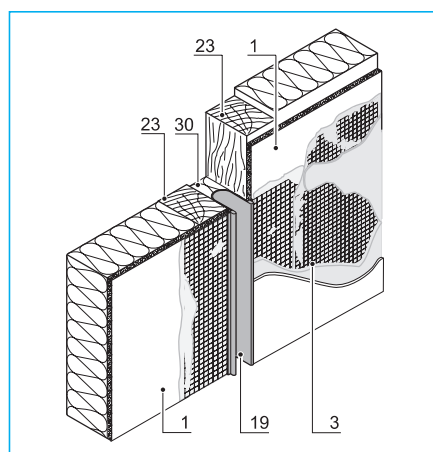
Base formation



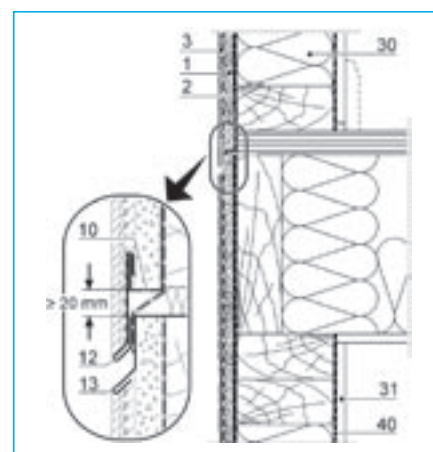
Eave formation



Verge formation

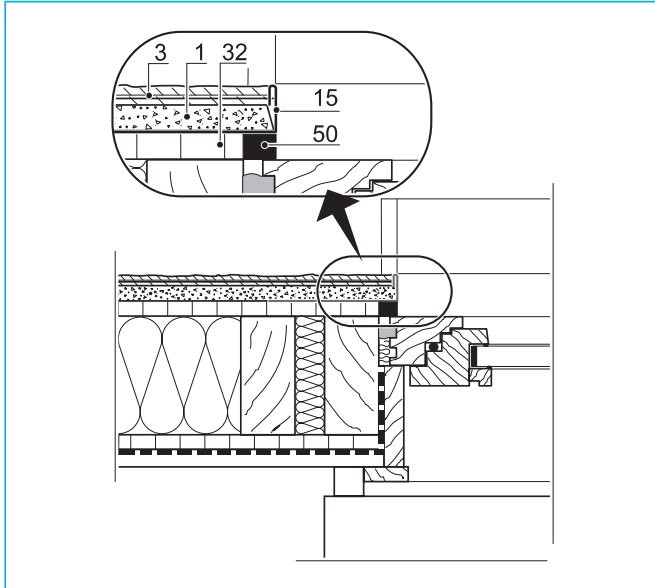


Vertical expansion joint



Horizontal expansion joint (formation in the area of ceilings)

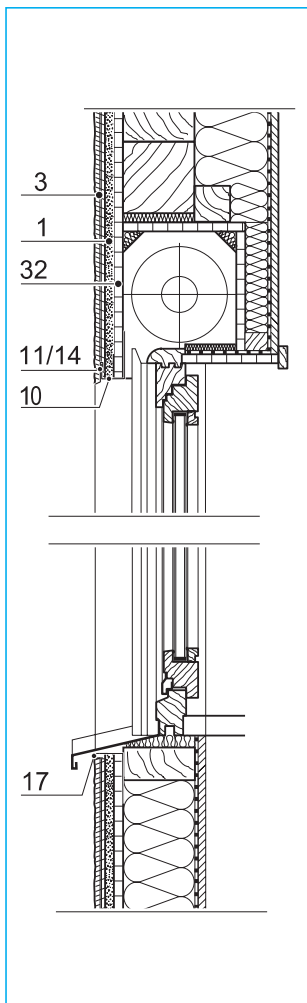
Details and construction examples



Side window connection

Note:

All detailed drawings are for illustrative purposes only. When wall constructions differ, detail is shown, per example, using the relevant layered construction.



Upper and lower window joins

Key

- 1 AQUAPANEL® Cement Board Outdoor
- 2 AQUAPANEL® Tyvek® StuccoWrap™
- 3 AQUAPANEL® plaster system
- 10 Rendering section, e.g. Protector 9408
- 11 Rendering section, e.g. Protector 9124, 6 mm plaster thickness
- 12 Drip edge section, e.g. Protector 9182
- 13 Rendering section, e.g. Protector 9181, 6 mm plaster thickness
- 14 Rendering section, e.g. Protector 9121, 10 mm plaster thickness
- 15 Profile end
- 16 Ventilation section
- 17 Cover section
- 19 Expansion joint section
- 23 Timber framework
- 30 Insulating material, e.g. Knauf Insulation or Heraklith
- 31 Interior panelling, e.g. Knauf GKB, 12.5 mm
- 32 Reinforcing panelling
- 40 Vapour barrier / airtight layer

50 Elastic sealant

53 Corner section, e.g. Protector 9103 or reinforcement mesh

H High spray water area
≥ 300 mm

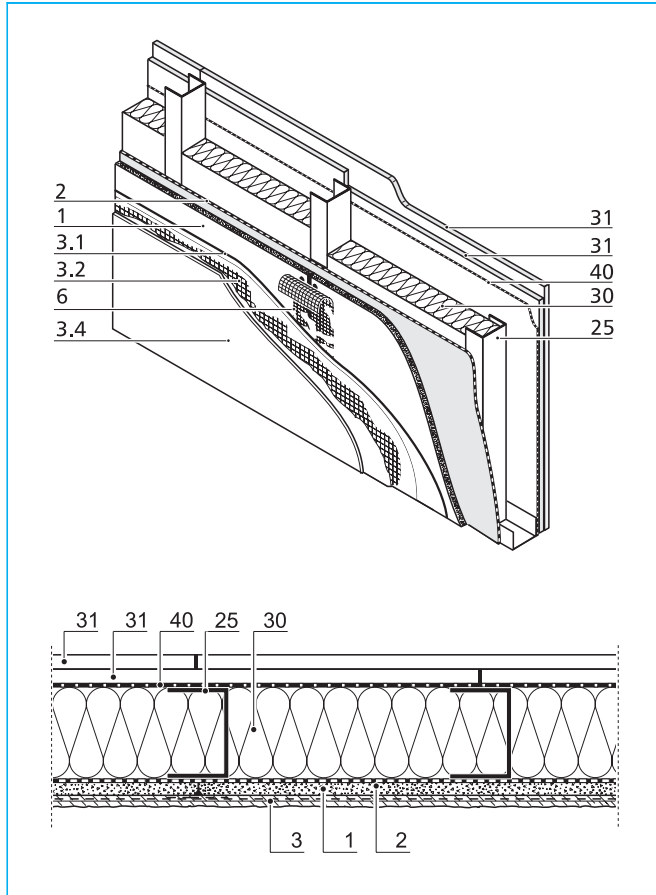
h Approx. 50 mm

Special construction notes:

- In the constructions shown above, AQUAPANEL® Cement Board Outdoor is fastened onto the supporting timber framework using AQUAPANEL® Rustproofed Screws, at a centre distance of 600/625 mm.
- An alternative attachment technique is with steel wire staples or screw nails. A datasheet is available on this topic, prepared in cooperation with Haubold – Kihlberg GmbH Hemmingen.
- Waterproofing foil should be used, where necessary.
- Expansion joints should be provided, at a spacing of at least 15m, to accommodate changes in shape due to weathering. The installation of additional horizontal expansion joints in the area of ceiling structures is recommended, to accommodate changes of shape of the timber framework.
- The wood material of the framework should meet a minimum quality of stiffness grade C24 to EN 338 and should have sufficient wood protection.

Water-managed exterior walls with metal framework

Non load-bearing, single-layer exterior wall



Key

- | | | | |
|-----|--|----|--|
| 1 | AQUAPANEL® Cement Board Outdoor | 6 | AQUAPANEL® Joint Filler – grey and AQUAPANEL® Tape (10 cm) |
| 2 | AQUAPANEL® Tyvek® StuccoWrap™ | 25 | Support section |
| 3 | AQUAPANEL® plaster system | 30 | Insulating material, e.g. Knauf Insulation or Heraklith |
| 3.1 | AQUAPANEL® Exterior Basecoat | 31 | Interior panelling, e.g. Knauf GKB, 12.5 mm |
| 3.2 | AQUAPANEL® Exterior Reinforcing Mesh | 40 | Vapour barrier / airtight layer |
| 3.3 | AQUAPANEL® Exterior Primer | | |
| 3.4 | AQUAPANEL® Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white | | |

Construction

Exterior wall without further requirements

- Exterior panelling of AQUAPANEL® Cement Board Outdoor
- AQUAPANEL® Tyvek® StuccoWrap™
- Metal support section, insulation material, interior panelling of Knauf GKB

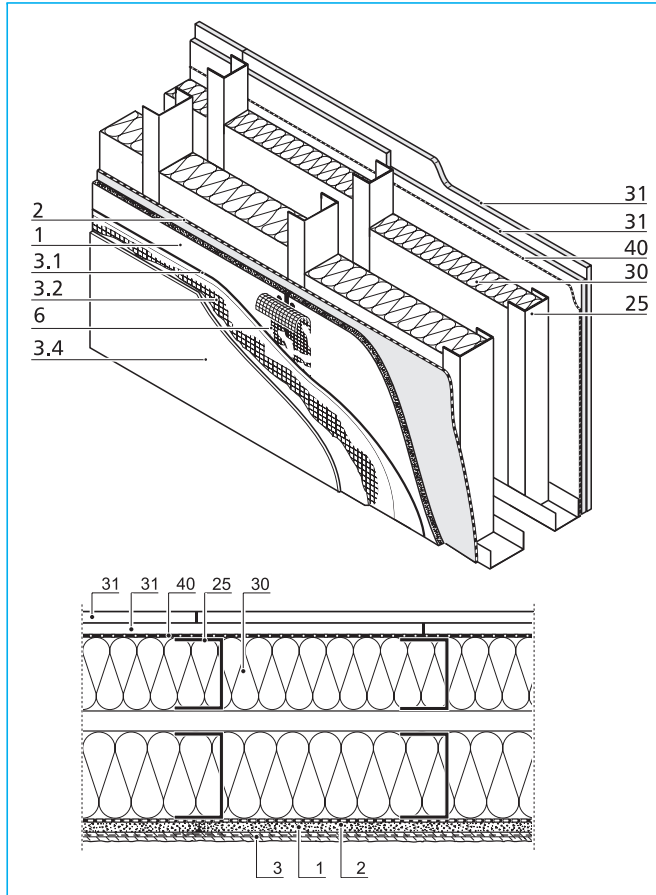
Non load-bearing, single-layer exterior wall

Technical data summary

| Profile/ Board | Dimensions [mm] | Mineral wool [mm] | Wall weight [kg/m ²] | System performance | | |
|--|---|----------------------|-------------------------------------|--------------------|------------|---------------------------|
| | | | | Fire | Sound [Rw] | Heat [W/m ² K] |
| CW 75/50/06 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 2 x 12,5 Knauf GKF | d=112.5; a= 600/625 (12.5+75+12.5+12.5) | 60 | 42 | EI30 | 50 dB | 0.56 |
| CW 75/50/06 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 2 x 15 Knauf GKB | d=117.5; a= 600/625 (12.5+75+15+15) | 60 | 47 | | 50 dB | 0.55 |
| CW 100/50/06 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 2 x 12,5 Knauf GKF | d=137.5; a= 600/625 (12.5+100+12.5+12.5) | 80 | 43 | EI30 | 50 dB | 0.44 |
| CW 100/50/06 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 2 x 15 Knauf GKB | d=142.5; a= 600/625 (12.5+100+15+15) | 80 | 48 | | 51 dB | 0.44 |

d=Combined thickness; a=Stud spacing / Insulation per 40 kg/m³, melting point ≥ 1000°C

Non load-bearing, double-layer exterior wall



Non load-bearing, double-layer exterior wall

Special construction notes

- In the constructions shown above, AQUAPANEL® Cement Board Outdoor is fastened onto the vertical support sections using AQUAPANEL® Maxi Screws, at a centre distance of 600/625 mm. The drill point or nail point should be used depending on the metal thickness.
- The vertical support sections should have a minimum flange width of 50 mm, to allow for the relevant edge gaps of the attachments.
- In buildings with a fascia height over 8.0 m, the central distance of the vertical support sections should be reduced to 300/312.5 mm in the corner and edge area of the façade.
- Waterproofing foil should be used, where necessary.
- The use of a double panelling with AQUAPANEL® Cement Board Outdoor or other panelling materials under the external panelling can also be done for fire protection reasons. There are various test certificates available for this up to F 90 quality.
- Expansion joints should be provided, at a spacing of at least 15 m, to accommodate changes in shape due to weathering. Expansion joints from the load-bearing construction should be taken up into the façade.
- The use of the single-layer wall construction is recommended for unheated buildings.
- In the case of fire resistance requirements, further board layers should be used on the inner side of the exterior stud.

Construction

Exterior wall without further requirements

- Exterior panelling of AQUAPANEL® Cement Board Outdoor
- AQUAPANEL® Tyvek® StuccoWrap™
- Metal supporting framework
- Insulation material, interior panelling of Knauf GKB

Technical data summary

| Profile/ Board | Dimensions [mm] | Mineral wool [mm] | Wall weight [kg/m ²] | System performance | | |
|---|--|----------------------|-------------------------------------|--------------------|------------|---------------------------|
| | | | | Fire | Sound [Rw] | Heat [W/m ² K] |
| CW 75/50/06 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 1 x 12.5 Knauf GKF + 1 x 15 Knauf GKB | d=200; a= 600/625 (12.5+75+12.5+e+75+15) | 60+60 | 66 | EI30 | 58 dB | 0.30 |
| CW 75/50/06 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 1 x 15 Knauf GKB + 1 x 15 Knauf GKB | d=202.5; a= 600/625 (12.5+75+15+e+75+15) | 60+60 | 69 | | 58 dB | 0.30 |
| CW 100/50/06 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 1 x 12.5 Knauf GKF + 1 x 15 Knauf GKB | d=225; a= 600/625 (12.5+100+12.5+e+75+15) | 80+60 | 67 | EI30 | 61 dB | 0.26 |
| CW 100/50/06 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 1 x 15 Knauf GKB + 1 x 15 Knauf GKB | d=227.5; a= 600/625 (12.5+100+15+e+75+15) | 80+60 | 70 | | 61 dB | 0.26 |

d=Combined thickness; a=Stud spacing; e=Wall gap of 10 mm / Insulation per 40 kg/m³, melting point ≥ 1000°C

Table to identify underconstruction for façade systems

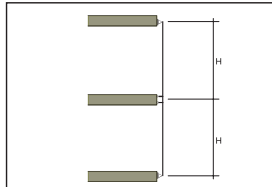
Wall heights

| Building height | Construction solution | Stud spacing of load carrying profiles (mm) | Recommended solution (depending on floor height in cm) | | | | | | | | | |
|-----------------|-----------------------|---|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | 270 | 280 | 290 | 300 | 310 | 320 | 330 | 340 | 350 | 360 |
| 0 < H < 20 m | Solution 1 | 400 | A | A | A | A | B | B | B | B | B | B |
| | | 600 | B | B | B | B | B | B | C | C | C | C |
| | | 625 | B | B | B | B | B | B | C | C | C | C |
| | Solution 2 | 400 | B | B | B | B | B | C | C | C | C | C |
| | | 600 | B | C | C | C | C | C | D | D | E | E |
| | | 625 | B | C | C | C | C | D | D | E | E | E |
| | Solution 3 | 400 | A | A | A | A | A | A | A | A | A | A |
| | | 600 | A | A | A | A | A | A | A | A | A | A |
| | | 625 | A | A | A | A | A | A | A | A | A | A |
| 20 < H < 100 m | Solution 1 | 400 | A | B | B | B | B | B | B | B | C | C |
| | | 600 | B | B | B | C | C | C | D | D | D | D |
| | | 625 | B | B | C | C | C | C | D | D | D | D |
| | Solution 2 | 400 | B | B | B | C | C | C | C | D | D | E |
| | | 600 | C | C | C | D | D | E | E | E | E | E |
| | | 625 | C | C | D | D | E | E | E | E | E | F |
| | Solution 3 | 400 | A | A | A | A | A | A | A | A | A | A |
| | | 600 | A | A | A | A | A | A | A | A | A | A |
| | | 625 | A | A | A | A | A | A | A | A | A | A |
| H > 100 m | Solution 1 | 400 | B | B | B | B | B | C | C | C | C | |
| | | 600 | C | C | C | C | C | C | D | E | E | E |
| | | 625 | C | C | C | C | C | D | D | E | E | E |
| | Solution 2 | 400 | C | D | D | D | D | D | D | E | E | E |
| | | 600 | C | D | D | E | E | E | E | E | F | F |
| | | 625 | C | D | D | E | E | E | E | E | F | F |
| | Solution 3 | 400 | A | A | A | A | A | A | A | A | A | A |
| | | 600 | A | A | A | A | A | A | A | A | A | A |
| | | 625 | A | A | A | A | A | A | A | A | A | A |

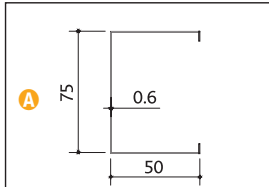
- A
- B
- C
- D
- E
- F

Assembly in front of floors

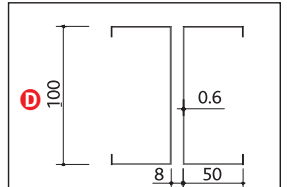
Statics scheme: Solution 1



Profile: CW 75 x 50 x 06

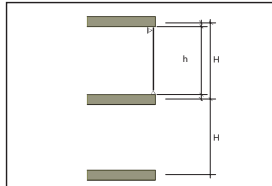


Profile: 2 x CW 100 x 50 x 06

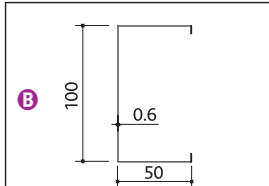


Assembly between floors

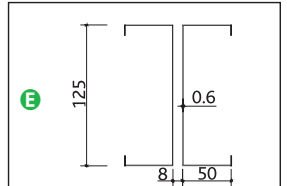
Statics scheme: Solution 2



Profile: CW 100 x 50 x 06

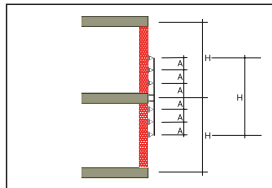


Profile: 2 x CW 125 x 50 x 06

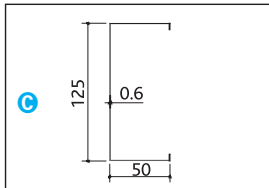


Ventilated assembly

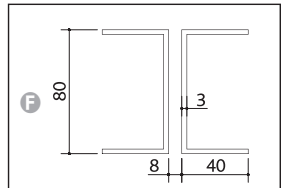
Statics scheme: Solution 3



Profile: CW 125 x 50 x 06



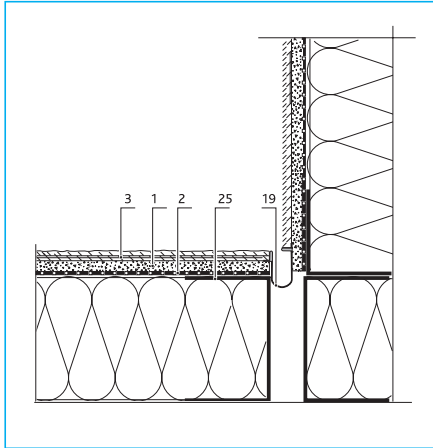
Profile: 2 x U 80 x 40 x 3 Alu



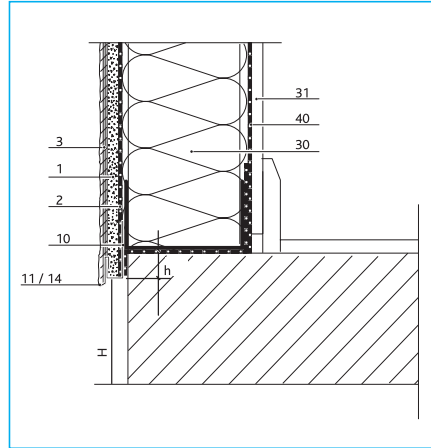
The profile recommendations given above are based on the load assumptions of DIN 1055 Part 4. The profiles for the normal range of facade sizes are shown according to their proven adequacy. The table only shows a selection of the usable stand profiles and is not complete. It should be treated as an indication for preliminary design purposes only. Final choice of profiles should be made based on relevant wall constructions with the help of the proof of stability report.

Water-managed exterior walls with metal framework

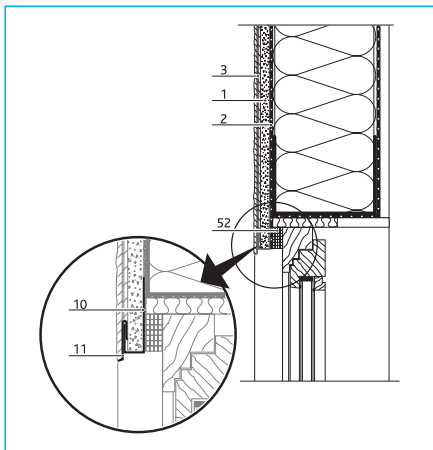
Details and construction examples



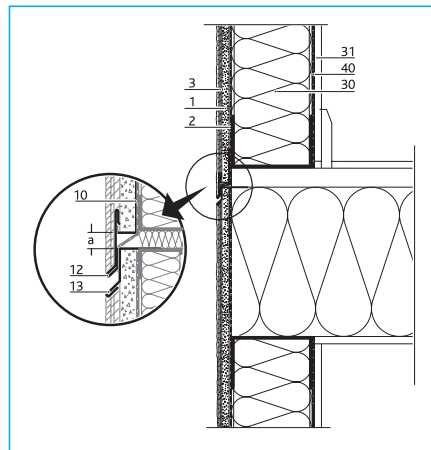
Internal corner



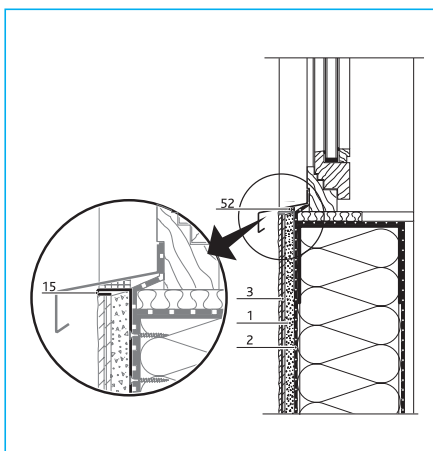
Base formation



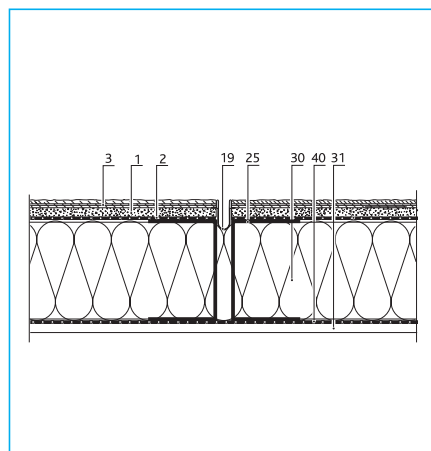
Upper window joint



Expansion joint - horizontal



Lower window joint



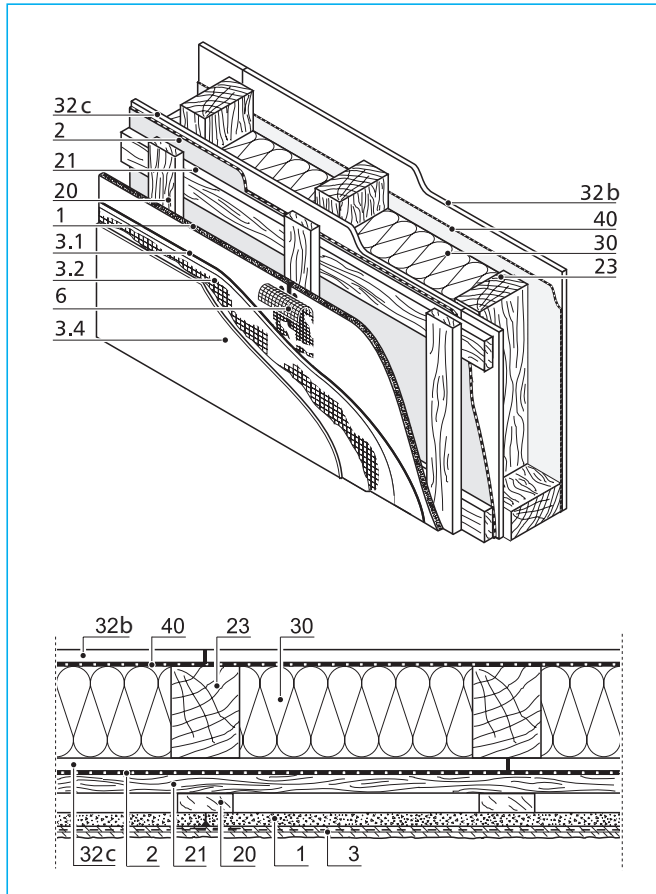
Expansion joint - vertical

Key

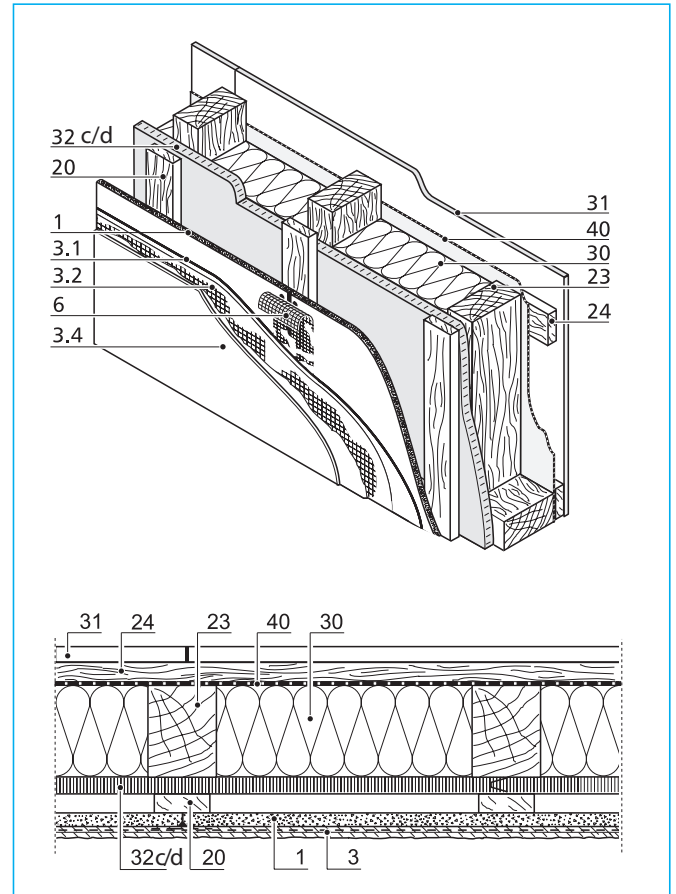
- 1 AQUAPANEL® Cement Board Outdoor
- 2 AQUAPANEL® TYVEK StuccoWrap™
- 3 AQUAPANEL® plaster system
- 6 AQUAPANEL® Joint Filler – grey and AQUAPANEL® Tape (10 cm)
- 10 Rendering section, e.g. Protector 9408
- 11 Rendering section, e.g. Protector 9124, 6 mm plaster thickness
- 12 Drip edge section, e.g. Protector 9182
- 13 Rendering section, e.g. Protector 9181, 6 mm plaster thickness
- 14 Rendering section, e.g. Protector 9121, 10 mm plaster thickness
- 15 Profile end
- 19 Expansion joint section
- 25 Support section
- 30 Insulating material, e.g. Knauf Insulation or Heraklith
- 31 Interior panelling, e.g. Knauf GKB, 12.5 mm
- 40 Vapour barrier / airtight layer
- 52 Sealing tape
- a Expansion joint 20 – 25 mm
- H High spray water area > 300 mm
- h Approx. 50 mm

Ventilated exterior walls with timber framework

Load-bearing exterior wall with ventilated façade, $R_w \leq 50$ dB



Exterior wall $R_w = 50$ dB



Exterior wall with OSB / gypsum fibre board and AQUAPANEL® Cement Board Outdoor on battens fitted with gaps

Construction

Exterior wall construction $R_w \leq 50$ dB to Test Report No. 42 000 1276

Exterior panelling of AQUAPANEL® Cement Board Outdoor with AQUAPANEL® plaster system:

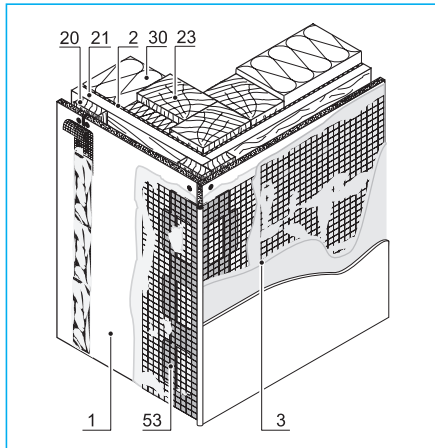
- On battens and laths
- Fastened with AQUAPANEL® Rustproofed Screws
- Second water-carrying layer with AQUAPANEL® Tyvek® StuccoWrap™
- With gypsum fibre board, e.g. Knauf Vidiwall GKF, 15 mm
- Mineral wool
- PE film, 0.3 mm, 170 g/m²
- Interior panelling of Knauf window protection boards GKF, 12.5 mm
- To test report No. 420001276 – MPA NRW

Exterior wall construction with OSB / gypsum fibre board

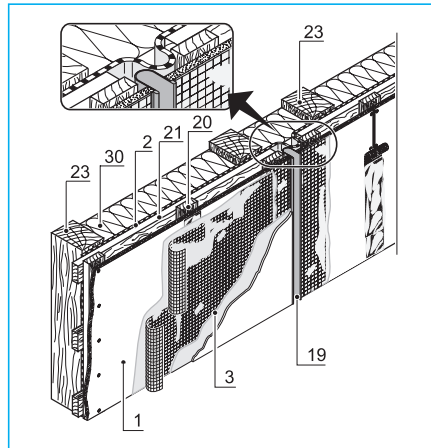
Exterior panelling of AQUAPANEL® Cement Board Outdoor with AQUAPANEL® plaster system

- On battens
- Second layer of OSB boards or Knauf Vidiwall, 15 mm
- Mineral wool
- PE film, 0.2 mm
- Interior panelling of Knauf boards GKB, 12.5 mm

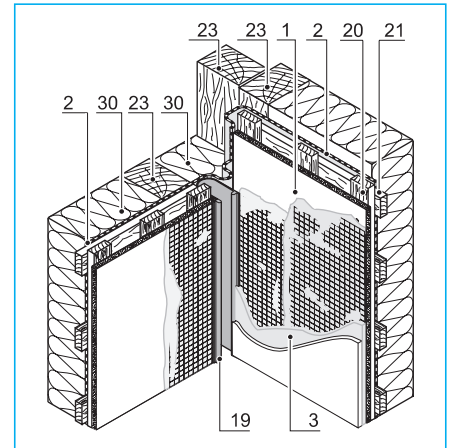
Details and construction examples



External corner



Expansion joint



Internal corner detail with expansion joint

AQUAPANEL® special construction notes:

- In the constructions shown above, AQUAPANEL® Cement Board Outdoor is fastened onto the vertical battens using AQUAPANEL® Rustproofed Screws, at a centre distance of 600/625 mm.
- The vertical laths should have a minimum width of 80 mm, to allow for the relevant edge gaps of the attachments.
- An alternative attachment technique is with steel wire staples or screw nails. A datasheet is available on this topic, prepared in cooperation with Haubold – Kihlberg GmbH, Hemmingen.
- In buildings with a fascia height over 8.0 m the central distance of the vertical support sections must be reduced to 300/312.5 mm in the corner and edge area of the façade.
- Waterproofing foil should be used, where necessary.
- Expansion joints should be provided, at a spacing of at least 15 m, to accommodate changes in shape due to weathering. The installation of additional horizontal expansion joints in the area of ceiling structures is recommended, to accommodate changes in shape of the timber framework.

Note:

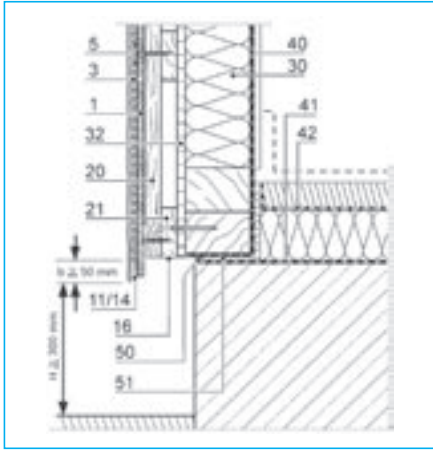
All detailed drawings are for illustrative purposes only. When wall constructions differ, detail is shown, per example, using the relevant layered construction.

Key

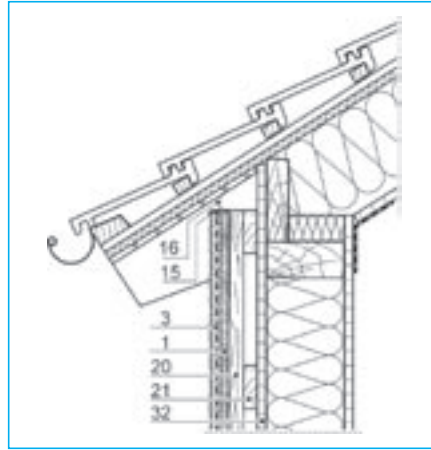
| | | | |
|-----|--|-----|---|
| 1 | AQUAPANEL® Cement Board Outdoor | 19 | Expansion joint section |
| 2 | AQUAPANEL® Tyvek® StuccoWrap™ | 20 | Laths |
| 3 | AQUAPANEL® plaster system | 21 | Battens |
| 3.1 | AQUAPANEL® Exterior Basecoat | 23 | Timber framework |
| 3.2 | AQUAPANEL® Exterior Reinforcing Mesh | 24 | Battens for installation level |
| 3.3 | AQUAPANEL® Exterior Primer | 30 | Insulating material, e.g. Knauf Insulation or Heraklith |
| 3.4 | AQUAPANEL® Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white | 31 | Interior panelling, e.g. Knauf GKB, 12.5 mm |
| 6 | AQUAPANEL® Joint Filler – grey and AQUAPANEL® Tape (10 cm) | 32b | Knauf Fibreboard GKF |
| | | 32c | Knauf Gypsum Fibre Vidiwall |
| | | 32d | OSB Board |
| | | 40 | Vapour barrier / airtight layer |
| | | 53 | Corner protection profile (e.g. Protector 9103) |

Ventilated exterior walls with timber framework

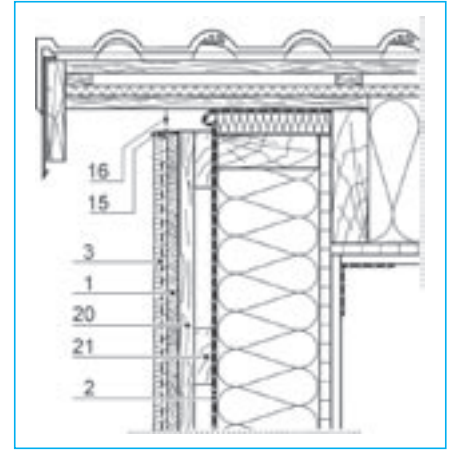
Details and construction examples



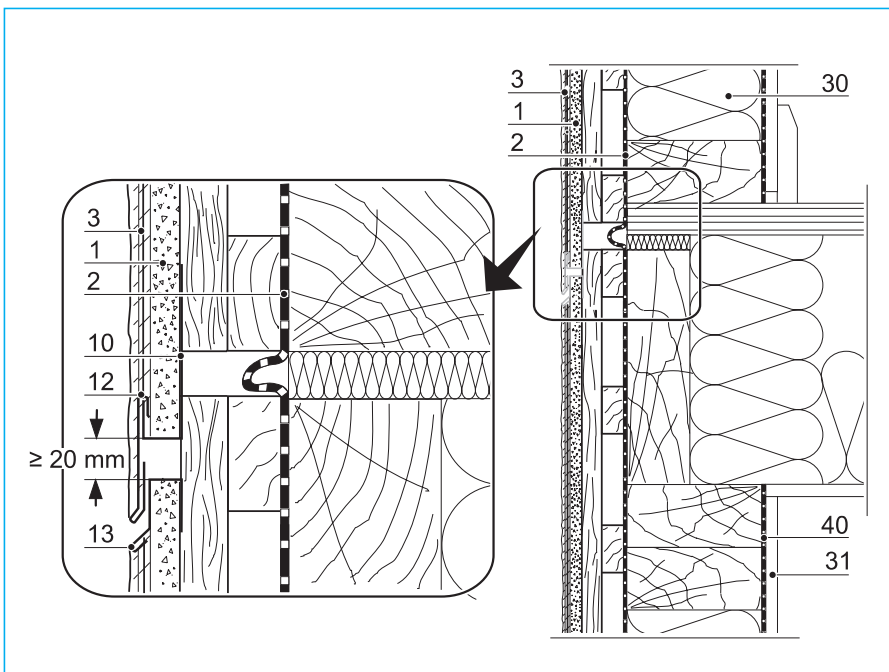
Base formation



Eave formation



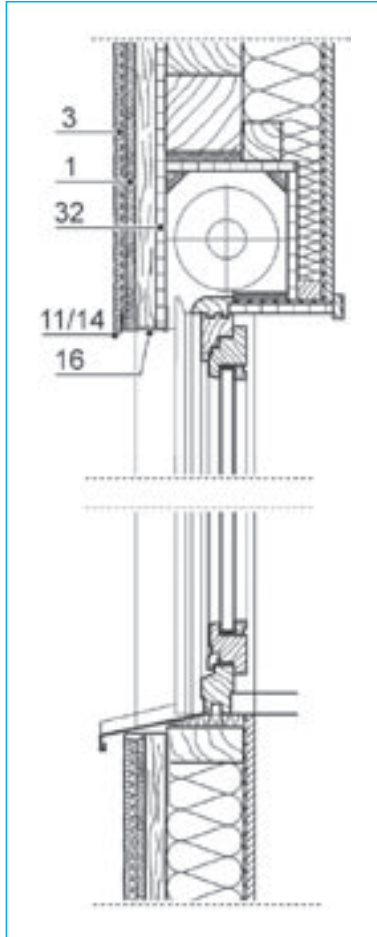
Verge formation



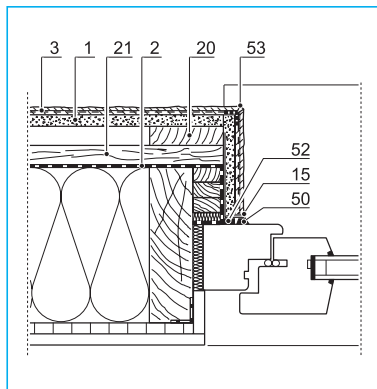
Horizontal expansion joint (formation in the area of ceilings)

Ventilated exterior walls with timber framework

Details and construction examples



Upper and lower window joint



Side window joint

Note:

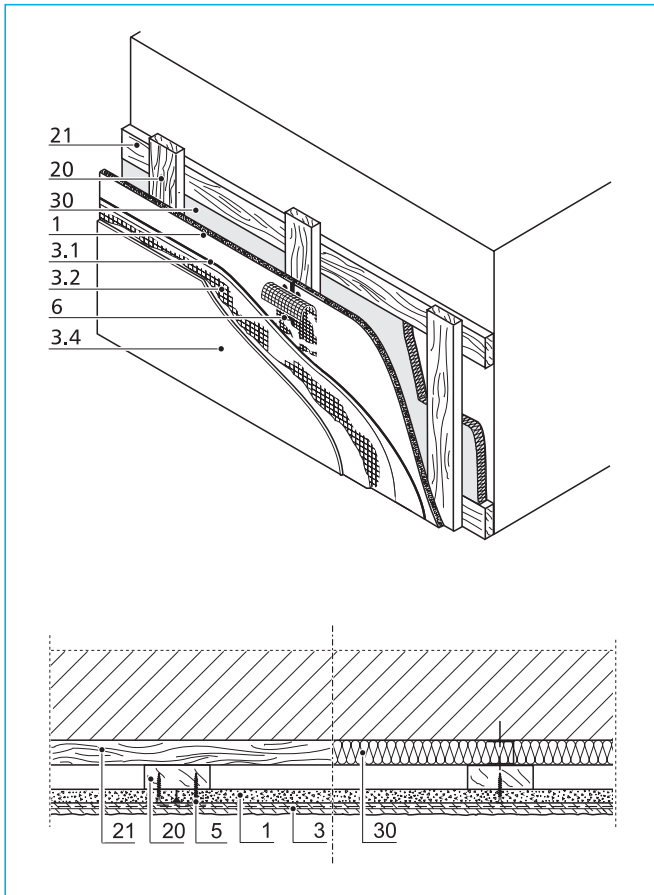
All detailed drawings are for illustrative purposes only. When wall constructions differ, detail is shown, per example, using the relevant layered construction.

Key

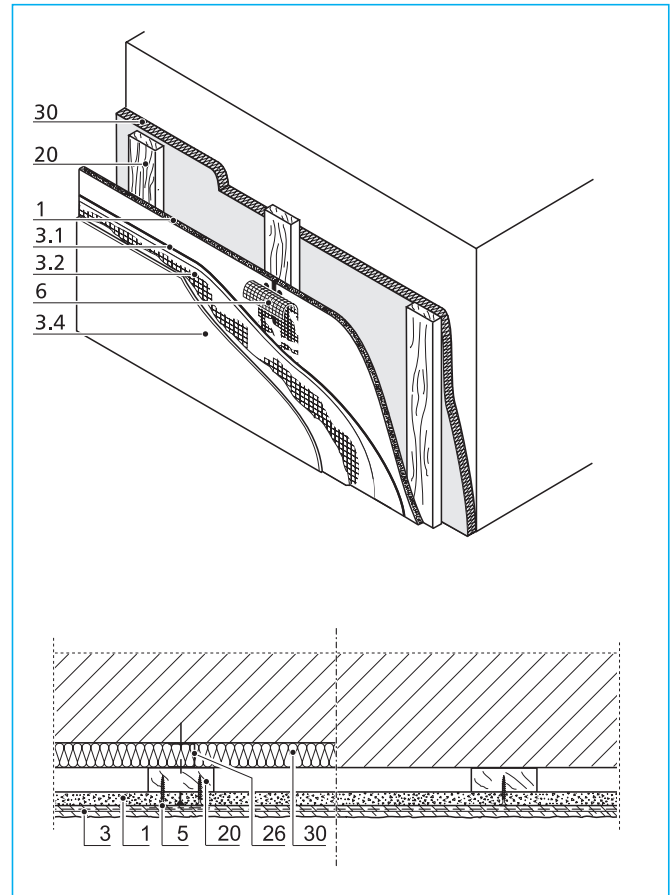
| | | | |
|----|---|----|---|
| 1 | AQUAPANEL® Cement Board Outdoor | 15 | Profile end |
| 2 | AQUAPANEL® Tyvek® StuccoWrap™ | 16 | Ventilation section |
| 3 | AQUAPANEL® plaster system | 20 | Laths |
| 5 | AQUAPANEL® Rustproofed Screw | 21 | Battens |
| 10 | Rendering section, e.g. Protector 9408 | 30 | Insulating material, e.g. Knauf Insulation or Heraklith |
| 11 | Rendering section, e.g. Protector 9124, 6 mm plaster thickness | 31 | Interior panelling, e.g. Knauf GKB, 12.5 mm |
| 12 | Drip edge section, e.g. Protector 9182 | 32 | Reinforcing panelling |
| 13 | Rendering section, e.g. Protector 9181, 6 mm plaster thickness | 40 | Vapour barrier / airtight layer |
| 14 | Rendering section, e.g. Protector 9121, 10 mm plaster thickness | 50 | Elastic sealant |
| | | 51 | Compensating mortar layer |
| | | 52 | Sealing tape |
| | | 53 | Corner section, e.g. Protector 9103 or reinforcement mesh |

Ventilated curtain walls

Ventilated curtain walls with timber framework



Ventilated façade fixed to base and supporting laths



Ventilated facade directly fixed or fitted with insulation

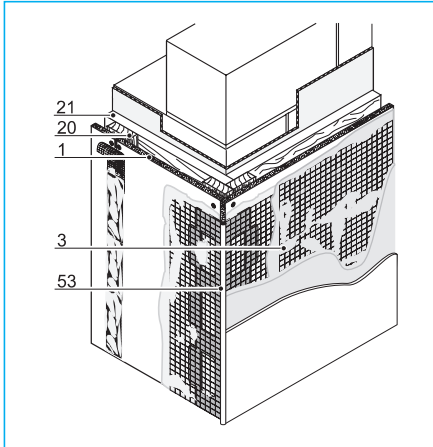
New-builds and existing, load-bearing old façades may be provided with curtain-type, ventilated façades and improved thermal resistance. Sound-proofing improvements may be achieved by curtain walls under certain circumstances, but this is not quantified. The following variants may be made:

- Ventilated façade of AQUAPANEL® Cement Board Outdoor with AQUAPANEL® plaster system with battens and laths with or without hydrophobic insulation layer between the battens
- Ventilated façade of AQUAPANEL® Cement Board Outdoor with AQUAPANEL® plaster system on vertical laths
- Ventilated façade of AQUAPANEL® Cement Board Outdoor with AQUAPANEL® plaster system with vertical laths in gap installation fitted on hydrophobic insulation layer.

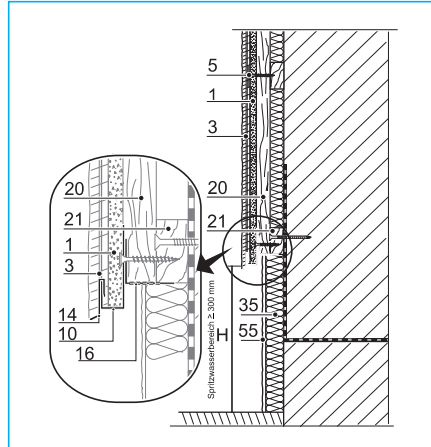
Key

- | | | | |
|-----|--|----|---|
| 1 | AQUAPANEL® Cement Board Outdoor | 10 | Rendering section, e.g. Protector 9408 |
| 3 | AQUAPANEL® plaster system | 14 | Rendering section, e.g. Protector 9121, 10 mm plaster thickness |
| 3.1 | AQUAPANEL® Exterior Basecoat | 15 | Profile end |
| 3.2 | AQUAPANEL® Exterior Reinforcing Mesh | 16 | Ventilation section |
| 3.3 | AQUAPANEL® Exterior Primer | 20 | Laths |
| 3.4 | AQUAPANEL® Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white | 21 | Battens |
| 5 | AQUAPANEL® Rustproofed Screw | 30 | Insulating material, e.g. Knauf Insulation or Heraklith |
| 6 | AQUAPANEL® Joint Filler – grey and AQUAPANEL® Tape (10 cm) | 32 | Reinforcing panelling |
| | | 35 | Perimeter insulation |
| | | 53 | Corner section, e.g. Protector 9103 or reinforcement mesh |
| | | 55 | Plinth plaster |

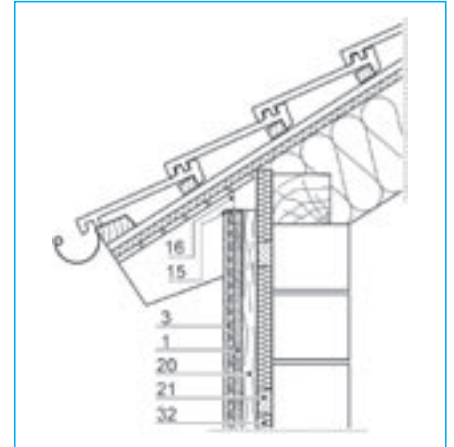
Ideal for renovation



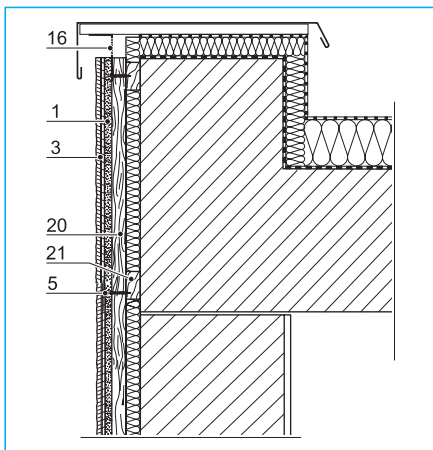
External corner



Base formation



Eave formation



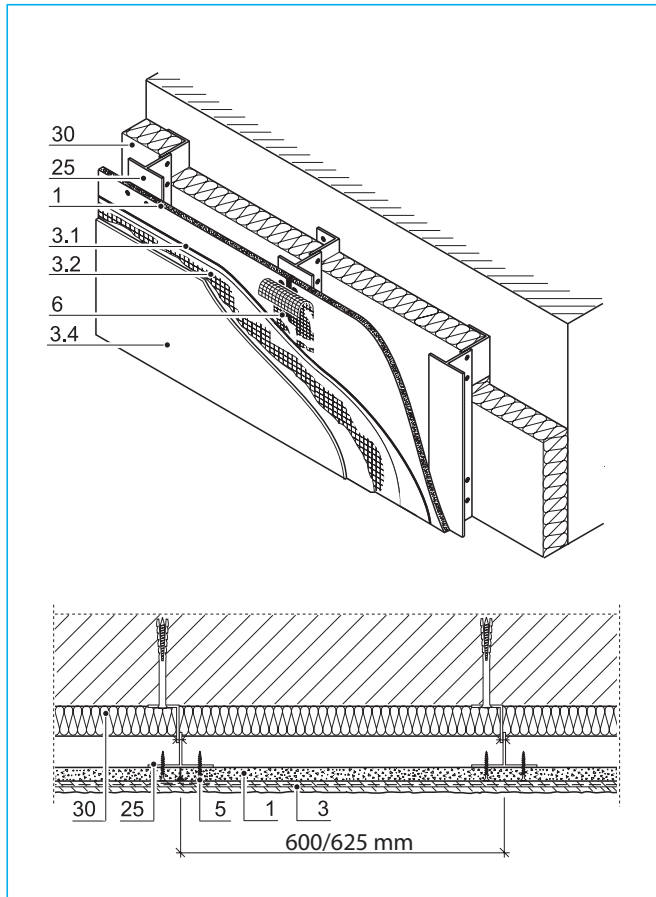
Upper closure for flat roofs

Special construction notes

- In the constructions shown above, AQUAPANEL® Cement Board Outdoor is fastened onto the vertical battens using AQUAPANEL® Rustproofed Screws, at a centre distance of 600/625 mm.
- The vertical battens should have a minimum width of 80 mm, to allow for the relevant edge gaps of the attachments.
- An alternative attachment technique is with steel wire staples or screw nails. A datasheet is available on this topic, prepared in cooperation with Haubold – Kihlberg GmbH, Hemmingen.
- In buildings with a fascia height over 8.0 m the central distance of the vertical support sections should be reduced to 300/312.5 mm in the corner and edge area of the façade.
- Expansion joints must be provided to accommodate change of shape due to weathering. Systematic joints should be arranged spaced at least 15 m apart. The installation of additional expansion joints may be required in certain façade geometries, e.g. with heavily angled façade surfaces, in order to accommodate change of shape.
- In the renovation of old buildings, the load-bearing capacity of the base must be checked, in particular when using a curtain-type ventilated façade.

Ventilated curtain walls

Ventilated curtain walls with metal framework



Key

- 1 AQUAPANEL® Cement Board Outdoor
- 3 AQUAPANEL® plaster system
 - 3.1 AQUAPANEL® Exterior Basecoat
 - 3.2 AQUAPANEL® Exterior Reinforcing Mesh
 - 3.3 AQUAPANEL® Exterior Primer
 - 3.4 AQUAPANEL® Silicon Synthetic Resin Plaster-white or AQUAPANEL® Exterior Dispersion Plaster – white
- 5 Recommended fastener
- 6 AQUAPANEL® Joint Filler – grey and AQUAPANEL® Tape (10 cm)
- 11 Rendering section, e.g. Protector 9124, 6 mm plaster thickness
- 15 Profile end
- 25 Support section
- 30 Insulating material, e.g. Knauf Insulation or Heraklith

Ventilated façade

As well as a timber framework, there are various substructure building units of aluminium available to planners and developers. These may be used for both new builds and in the renovation of old façades. Substructure building units can be procured from the following contacts. Selection of a suitable system must be matched to the requirements of AQUAPANEL® Cement Board Outdoor depending on the objective.

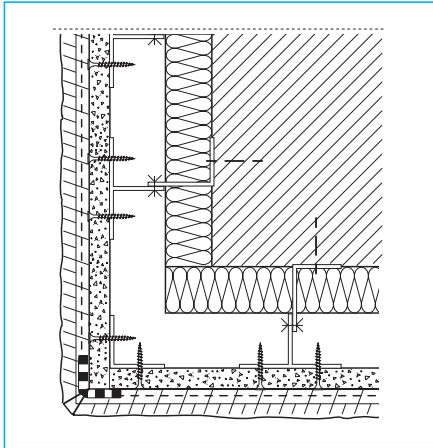
EuroFOX Engineering
 Eichbüchlergasse 18
 A-2700 Wiener Neustadt
 Österreich
 Tel: +43 (0) 2622 69001 - 0
 Fax: +43 (0) 2622 69001 - 69
 E-Mail: eurofox@eurofox.com
 www.eurofox.com

WS Fassadenelemente GmbH
 Brackestraße 1
 38159 Vechelde
 Telefon: (0 53 02) 91 91-0
 Telefax: (0 53 02) 91 91-69
 E-Mail: info@wagner-sytem.com
 www.wagner-system.com

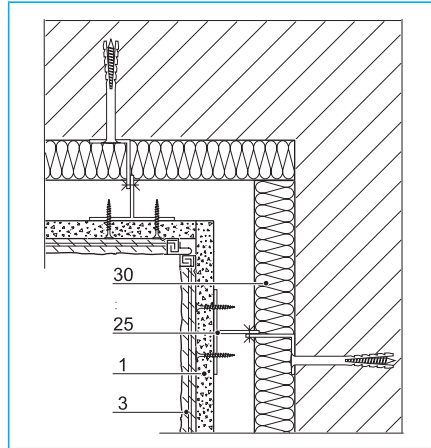
NAUTH SL Fassadentechnik GmbH
 Weinstr. 68 b
 D-76887 Bad Bergzabern
 Fon: 06343 / 7003-0
 Fax: 0 6343 / 7003-20
 E-Mail: info@nauth-sl.de
 www.nauth-sl.de

BWM Dübel + Montagetechnik GmbH
 Ernst-Mey-Straße 1
 70771 Leinfelden-Echterdingen
 Telefon: (07 11) 9 03 13-0
 Telefax: (07 11) 9 03 13-20
 E-Mail: info@bwm.de
 www.bwm.de

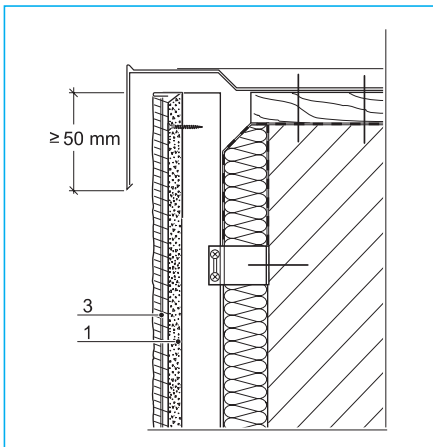
Details and construction examples



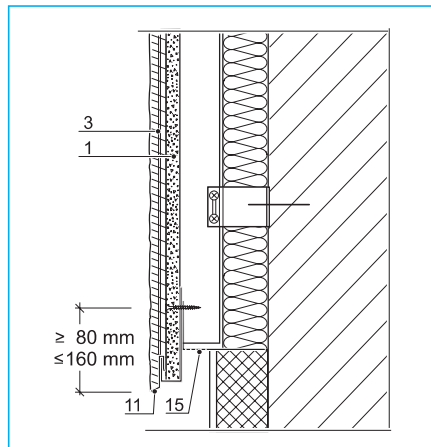
External corner



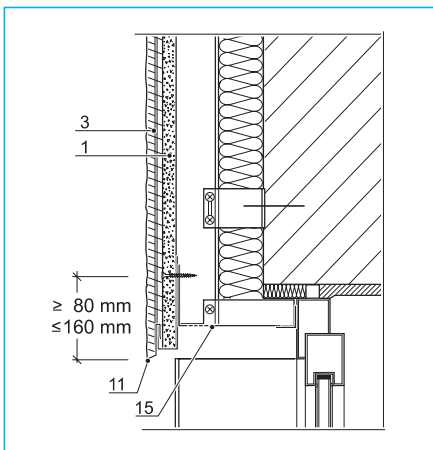
Internal corner



Verge formation



Base formation



Window join

2. Blind rivet with large shoulder K14 – Al/E – 5.0×18 mm. The use of fastenings of equivalent value is possible.

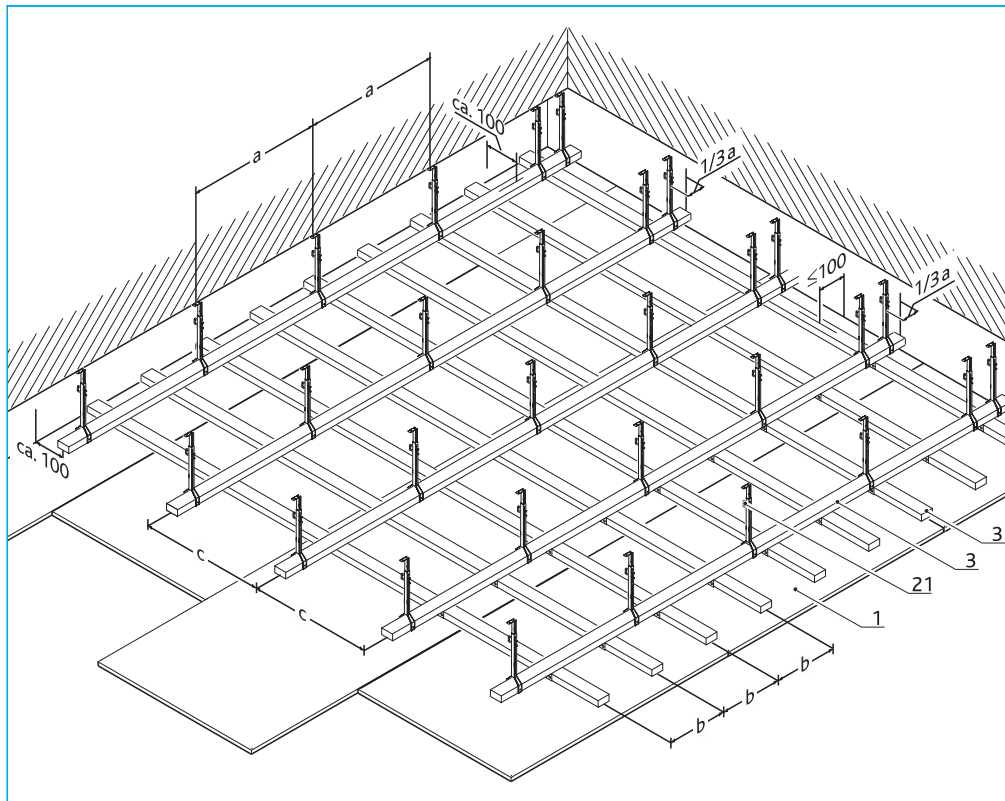
- The vertical support sections should have a minimum flange width of 60 mm to allow for the relevant edge gaps of the attachments.
- In buildings with a fascia height over 8.0 m the central distance of the vertical support sections should be reduced to 300/312.5 mm in the corner and edge area of the façade.
- Expansion joints must be provided to accommodate change of shape due to weathering. Systematic joints should be arranged spaced at least 15 m apart. The installation of additional expansion joints may be required in certain façade geometries to accommodate change of shape due to weathering, particularly with inner corners.
- The use of a separating strip between the aluminium supporting section and the rear of the AQUAPANEL® Cement Board Outdoor is recommended.
- In the renovation of old buildings, the load-bearing capacity of the base must be checked, particularly when using a ventilated curtain wall.

Special Notes

- In the constructions shown above, AQUAPANEL® Cement Board Outdoor is fastened onto the vertical support sections at a centre distance of 600/625 mm.
- When attaching the AQUAPANEL® Cement Board Outdoor to the aluminium substructure, select fastenings of stainless steel. Both of the following fastenings of EJOT Baubefestigungen GmbH, Bad Laasphe are recommended:
 1. Stainless Steel – SAPHIR drilling screw JT4 – STS – 3 (4.8 × 35 mm)

Exterior ceilings and soffits

Exterior ceilings – timber framework

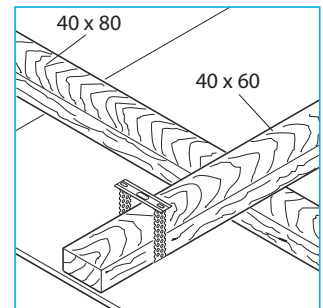


Abbreviations

- a Spacing of the direct ceiling hangers (mm)
- b Spacing of the foundation battens 40/80 (mm)
- c Spacing of the supporting laths 40/60 (mm)

Key

- 1 AQUAPANEL® Cement Board Outdoor
- 3 Battens and laths
- 21 Vernier gauge hanger with securing brackets or direct suspension hangers



Suspension using Nonius hangers

Direct securing with only one batten

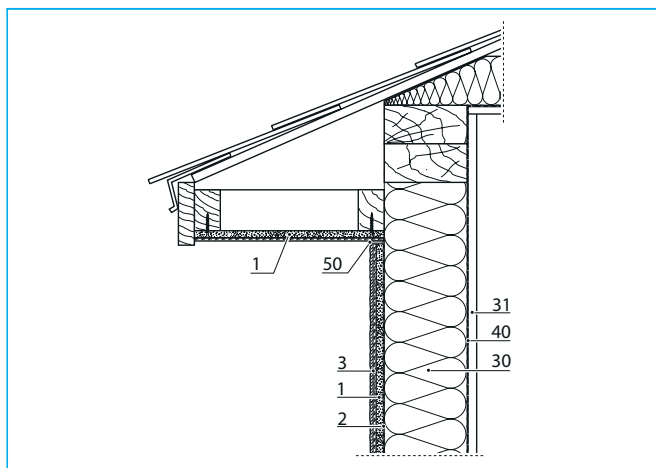
Distance between laths and battens and suspension points

| Layer option | Ceiling weight | Hangers | Distance (mm) | | |
|---|--------------------------|---------|---------------|----------------|--------|
| AQUAPANEL® Cement Board Outdoor (1 x 12.5 mm) | ca. 20 kg/m ² | 0.4 kN | a: 600 | b: 312.5 (300) | c: 600 |

Direct application with one lath

| | | | | |
|---|----------------------|--------|----------------|--------|
| AQUAPANEL® Cement Board Outdoor (1 x 12.5 mm) | 20 kg/m ² | 0.4 kN | b: 312.5 (300) | c: 600 |
|---|----------------------|--------|----------------|--------|

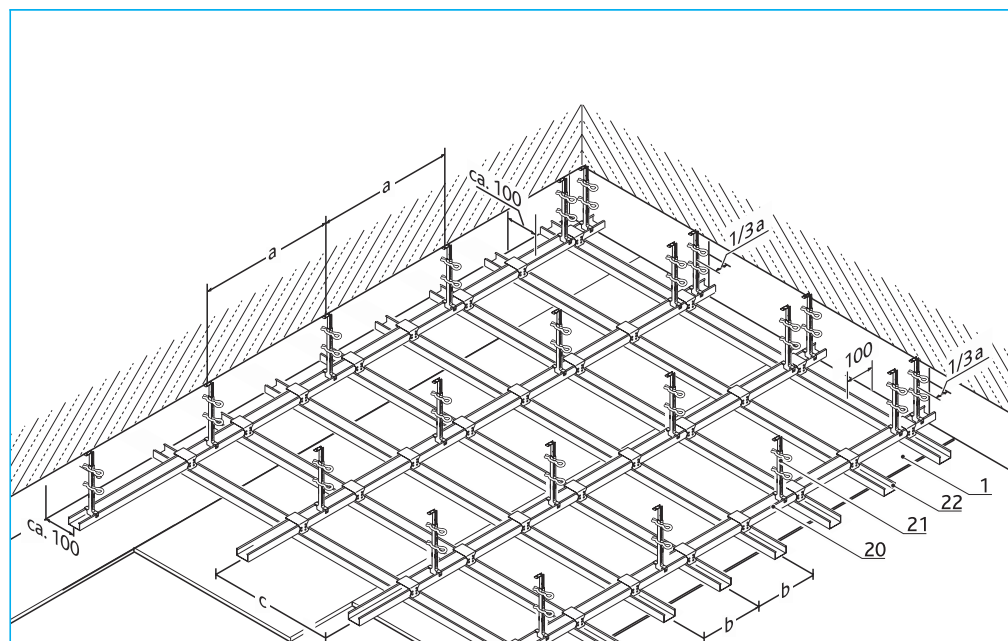
Exterior soffits



Key

- 1 AQUAPANEL® Cement Board Outdoor
- 2 AQUAPANEL® Tyvek® StuccoWrap™
- 3 AQUAPANEL® plaster system
- 30 Insulating material, e.g. Knauf Insulation or Heraklith
- 31 Interior panelling, e.g. Knauf GKB, 12.5 mm
- 40 Vapour barrier / airtight layer
- 50 Elastic sealant

Exterior ceilings – metal framework



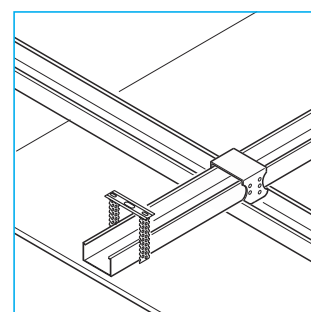
Suspension using Nonius hangers

Abbreviations

- a Spacing of the vernier gauge or direct ceiling hangers (mm)
- b Spacing (mm) of the supporting sections (C ceiling section 60/27/0.6)
- c Spacing (mm) of the base sections

Description of the material

- 1 AQUAPANEL® Cement Board Outdoor
- 20 Base C ceiling section
- 21 Vernier gauge hanger with securing brackets or direct ceiling hanger
- 22 Supporting C ceiling section



Alternative suspension using direct hanger

Distance between laths and battens and suspension points

| Layer option | Ceiling Weight | Hangers | Distance (mm) |
|--|--------------------------|---------|------------------------------------|
| 1) AQUAPANEL® Cement Board Outdoor (1 x 12.5 mm) | ca. 20 kg/m ² | 0.4 kN | a: 750 b: 312.5 (300) c:1000 |

Fire grading period during fire load from the underneath

| Layer | Mineral wool (A1, Melting point >1000°C) | | Fire resistance class | |
|---|--|--|-----------------------|-----------------|
| | Thickness (mm) | Minimum Gross density (kg/m ³) | Test certificate | |
| 1) 1 x 12.5 mm AQUAPANEL® Cement Board Outdoor + 1 x 12.5 mm GKF | - | - | F 30-A | 3461/7923-Mer |
| 2) 2 x 12.5 mm AQUAPANEL® Cement Board Outdoor | 2 x 40 | 50 | EI30 | c. Pr-02-02.092 |

■ Note: For joint treatment/finishing/plastering, please follow the recommendations and regulations for ceiling systems given on page 19.

Special Notes

The ceiling systems with the system dimensions and section values shown here are only valid for the installation up to a height of 8.0 m over the upper edge of the ground. For installation at heights greater than 8.0 m over the upper edge of the ground, select reduced system gaps or other section values. To do this, a proof of stability is required. The notes of reports and certificates have to be considered for ceilings with fire protection requirements.

Exterior systems

Basis of calculation – wall systems

Basis of calculation for wall systems with AQUAPANEL® Cement Board Outdoor

Panel and plastering system

| Material requirement | Unit | Per m ² |
|--|----------------|--------------------------------|
| AQUAPANEL® Cement Board Outdoor (single layer) | m ² | 1.0 |
| AQUAPANEL® Tyvek® StuccoWrap™ | m ² | 1.1 |
| AQUAPANEL® Maxi Screws | piece | 15 for stud spacing 600/625 mm |
| AQUAPANEL® Façade Screw | piece | 15 for stud spacing 600/625 mm |
| AQUAPANEL® Joint Filler – grey | kg | 0.7 |
| AQUAPANEL® Tape (10 cm) | m | 2.1 |
| AQUAPANEL® Exterior ReinforcingTape | m | 2.1 |
| AQUAPANEL® Exterior Basecoat | kg | 7.8 at thickness of 5 mm |
| AQUAPANEL® Betocoat | kg | 3.6 at thickness of 5 mm |
| AQUAPANEL® Exterior Reinforcing Mesh | m ² | 1.1 |
| AQUAPANEL® Exterior Primer | g | 100-150 |
| AQUAPANEL® Exterior Dispersion Plaster – white | kg | 3.1 |
| AQUAPANEL® Silicon Synthetic Resin Plaster | kg | 3.1 |

Assembly time

| System components | Per m ² (installation by hand) | Per m ² (installation by machine) |
|--|---|--|
| Assembly of AQUAPANEL® Cement Board Outdoor, including screws, joint filler and tape | 15 Minuten | - |
| AQUAPANEL® Exterior Basecoat | 8-10 Minutes | 5 Minutes |
| AQUAPANEL® Betocoat | 8-10 Minutes | - |
| AQUAPANEL® Exterior Reinforcing Mesh | 3-4 Minutes | - |
| AQUAPANEL® Exterior Primer | 1 Minute | - |
| AQUAPANEL® Silicon Synthetic Resin Plaster | 12 Minutes | 12 Minutes |
| AQUAPANEL® Exterior Dispersion Plaster – white | 12 Minutes | 12 Minutes |

Basis of calculation – ceiling systems

Basis of calculation for ceiling systems with AQUAPANEL® Cement Board Outdoor

Panel and coating system

| Material requirement | Unit | Per m ² |
|--|---------------------|-------------------------------|
| AQUAPANEL® Cement Board Outdoor (single layer) | m ² | 1 |
| AQUAPANEL® Maxi Screws | piece | 25 for stud spacing 300/312.5 |
| AQUAPANEL® Tape (10 cm) | m | 2.1 |
| AQUAPANEL® Interior Primer | g | ca. 40-60 |
| AQUAPANEL® Joint Filler – grey | kg | 0,7 |
| AQUAPANEL® Joint Filler and Skim Coating – white | kg (thickness 4 mm) | 3,5 |
| AQUAPANEL® Exterior Reinforcing Mesh | m ² | 1.1 |

Assembly time

| | Per m ² (installation by hand) | Per m ² (installation by machine) |
|--|---|--|
| Assembly of AQUAPANEL® Cement Board Outdoor, including screws, joint filler and tape | 18 Minutes | - |
| AQUAPANEL® Interior Primer | 1 Minute | - |
| AQUAPANEL® Joint Filler and Skim Coating – white | 12-15 Minutes | 7 Minutes |
| AQUAPANEL® Exterior Reinforcing Mesh | 4-5 Minutes | - |

An extremely *durable* building material



Technical data and certificates

Physical properties

| | |
|---|---|
| Width (mm) | 900 |
| Length (mm) | 1200/1250/2400/2500 |
| Thickness (mm) | 12.5 |
| Min. bending radius (m) for 900 mm wide board | 3 |
| Min. bending radius (m) for 300 mm wide strip | 1 |
| Weight (kg/m ²) | approx. 16 |
| Dry density (kg/m ³) | approx. 1150 |
| Flexural strength (N/mm ²) | ≥ 6.2 |
| pH-value | 12 |
| Modulus of elasticity (N/mm ²) | approx. 4000 - 7000 |
| Thermal conductivity acc. to DIN 4108 λ_r (W/(m·K)) | 0.36 |
| Thermal expansion (10 ⁻⁶ /K) | 7 |
| Water vapour diffusion resistance μ (-) | 19 |
| Change in dimensions from dry to water-saturated (%) | 0.1 |
| Building Material Class | Non-combustible; A1 according to EN 13501 |

Additional certifications/ test reports/ expert assessments

| Report no. | Norm | Content |
|--------------|------------------|---------------------------|
| BBW0215050 | DIN EN ISO 12572 | Water vapour permeability |
| BBW0215050 | DIN 52612-1 | Thermal conductivity |
| BBW0215050/1 | DIN 52104-2 | Freeze-thaw-cycling |
| 3001-56 | - | Environmental compliance |
| 3001-57 | - | Resistance to mould |
| 220004884/06 | BS8200 | Impact resistance |

Serviceability

| Report no. | Standard | Construction |
|-------------------------------|-----------|----------------------|
| 01.1.01/1 (18. February 2003) | ETAG 004* | Ventilated system |
| 02.1.15/1 (15. July 2003) | ETAG 004* | Water-managed system |

*The certification is derived from ETAG 004.

Technical Data

System performance

Overview: acoustic tests. Walls with AQUAPANEL® Cement Board Outdoor

| Test report | Sound insulation [dB] | Inside layer | Outside layer | Underconstruction | Insulation material Mineral wool thickness (gross density) |
|--------------|-----------------------|-----------------|---|-------------------|--|
| 420001590-9 | $R_{w,P} = 50$ | 1 x GKF 12.5 mm | 1 x Outdoor | CW100 | MW 80 mm (14 kg/m ³) |
| 420001276-7 | $R_{w,P} = 45$ | 1 x GKF 12.5 mm | 1 x Outdoor | CW50 | MW 50 mm (22 kg/m ³) |
| 420001276-8 | $R_{w,P} = 48$ | 2 x GKF 12.5 mm | 1 x Outdoor | CW50 | MW 50 mm (22 kg/m ³) |
| 420001590-10 | $R_{w,P} = 54$ | 1 x GKF 12.5 mm | 1 x Perlite Dämmplatte incl. reinforcing + 1 x Outdoor | CW100 | MW 80 mm (14 kg/m ³) |
| 420001276-6 | $R_{w,P} = 53$ | 1 x GKF 12.5 mm | 1 x Outdoor | 2 x CW50 | 2 x MW 50 mm (22 kg/m ³) |
| 420001276-9 | $R_{w,P} = 47$ | 1 x GKF 12.5 mm | 1 x Outdoor water-managed + 1 x Vidiwall 15 mm | HS 60/120 | MW 120 mm (26 kg/m ³) |
| 420001276-10 | $R_{w,P} = 50$ | 1 x GKF 12.5 mm | Outdoor ventilated on laths + 1 x Vidiwall 15 mm | HS 60/120 | MW 120 mm (26 kg/m ³) |

Overview: fire performance tests. Walls with AQUAPANEL® Cement Board Outdoor

| Class | Inside layer | Outside layer | Profile | Insulation material (>1000°C) | Test report |
|---|---|--|---------------|--|---|
| F 30-B | 1 x Outdoor | 1 x Outdoor | HS 55/55** | MW 40 mm (40 kg/m ³) | P-3051/0419-MPA BS |
| F 30-B | 1 x Outdoor + 1 x OSB 15 mm | 1 x Outdoor + 1 x OSB 15 mm | HS 70/140** | Isofloc (62 kg/m ³) | P-3065/0559-MPA BS |
| F 30-A | 1 x Outdoor | 1 x Outdoor | CW 75 | MW 40mm (40 kg/m ³) | P-3063/0539-MPA BS Nr. 3465/2295-Kra- |
| EI 30* | GKF 12.5 mm | Outdoor | CW 75 | MW 40mm (40 kg/m ³) | Nr. 3031/2742 |
| EI 60* | 2 x GKF 12.5 mm | Outdoor | CW 75 | MW 60mm (50 kg/m ³) | Nr. 3973/1183 |
| F 30-B _{inside} | 1 x GKF 12.5 mm 1 x GF 12.5 mm | Outdoor + GKFI 18 mm Outdoor + GKFI 18 mm | | | P-3500/6453-MPA BS |
| F 90-B _{outside} | 1 x GKF 12.5 mm 1 x GF 12.5 mm | Outdoor + GF 15 mm Outdoor + GF 15 mm | HS 60/120** | MW 120 mm (40 kg/m ³) | |
| F 30-B _{inside} F 90-B _{outside} | 1 x Indoor 1 x Indoor | Outdoor + GKFI 18 mm Outdoor + GF 15 mm | | | P-3500/6453-MPA BS |
| F 90-B | 2 x Outdoor | 2 x Outdoor | HS 60/60** | MW 40 mm (40 kg/m ³) MW 60 mm (50 kg/m ³) | P-3053/0439-MPA BS Nr. 3215/1952-WI/Rm |
| F 90-B | Indoor + GKF 12.5 mm 3 x GKF 12.5 mm | Outdoor + GKF 12.5 mm Plywood 11 mm + MW 20 mm (160kg/m ³) + Outdoor | HS 60/120** | 2 x MW 60 mm (50 kg/m ³) | P-3059/0499-MPA BS Nr. 3621/4713-WI- Nr. 022/96/KRA |
| F 90-A | 2 x Outdoor | 2 x Outdoor | | MW 60 mm (50 kg/m ³) MW 40 mm (40 kg/m ³) | P-3048-0389-MPA BS Certification No. 3208/1932-WI/Rm |
| | Indoor + GKF (-I) 12.5 mm | Outdoor + GKF (-I) 12.5 mm | CW Profil | CW 100: MW 80 mm (30 kg/m ³) | Expert report 108/WI Additional certificate No. 022/96/KRA |
| F 90-A | 3 x GKF 12.5 m | 2 x Outdoor + MW 30 mm (160 kg/m ³) | CW 150,1.5 mm | MW 80 mm (40 kg/m ³) + 60 mm (40 kg/m ³) | P-3058/0489-MPA BS Nr. 8138/5272-WI/Rm |

*Proof according to EN-Norm

** HS=timber stud

Overview: fire performance tests. Ceilings with AQUAPANEL® Cement Board Outdoor

| Class | Layer | Underconstruction | Insulation material (>1000°C) | Test report |
|--------|-----------------------|--|--------------------------------------|---|
| F 30-A | Outdoor + GKF 12.5 mm | Metal-UK | - | P-3067/0579-MPA BS Certification No. 3461/7923-Mer- Additional certificate No. 022/96/KRA |
| EI 30 | 2 x Outdoor | CD 60/27 Base profile space 750 mm Supporting profile space 312,5 mm | MW 2 x 40 mm (50 kg/m ³) | Pr-02-02.092 |

Sample specification

1. Wall

Directly-applied (water managed) application

| Item | Unit | Specification | Individual price (€) | Total price (€) |
|------|----------------|--|----------------------|-----------------|
| 1.1 | m | Substructure made from metal single fixture mount, galvanised UW/CW profile, stud spacing o.c. distance 600/625 mm; alternatively, timber frame, stud spacing o.c. distance 600/625 mm or according to statics calculations | | |
| 2.1 | m ² | AQUAPANEL® Tyvek® StuccoWrap™ | | |
| 3.1 | m ² | AQUAPANEL® Cement Board Outdoor, fixed with AQUAPANEL® Maxi screws, joints filled with AQUAPANEL® Joint Filler – grey and reinforced with AQUAPANEL® Tape (10 cm)/Exterior Reinforcing Tape, screws evened out with AQUAPANEL® Joint Filler – grey | | |
| 4.1 | m | Attaching the corner/base profile | | |
| 4.2 | piece | Reinforcing of the door and window openings with AQUAPANEL® Exterior Reinforcing Tape and/or exterior fabric (300 x 500 mm) | | |
| 5.1 | m ² | Basecoating of the entire surface with AQUAPANEL® Exterior Basecoat, entire surface reinforced with AQUAPANEL® Exterior Reinforcing Mesh | | |
| 6.1 | m ² | Priming of the surface with AQUAPANEL® Exterior Primer | | |
| 7.1 | m ² | Coating of the surface with AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white | | |

2. Wall

Ventilated system

| Item | Unit | Specification | Individual price (€) | Total price (€) |
|------|----------------|--|----------------------|-----------------|
| 1.1 | m | Basic laths with supporting laths as counter battens. Stud spacing o.c. between supporting laths distance 600/625 mm | | |
| 2.1 | m ² | Additional insulation, water-repellent | | |
| 3.1 | m ² | AQUAPANEL® Cement Board Outdoor, fixed with AQUAPANEL® Maxi screws, joints filled with AQUAPANEL® Joint Filler – grey and reinforced with AQUAPANEL® Tape (10 cm)/Exterior Reinforcing Tape, screws evened out with AQUAPANEL® Joint Filler – grey | | |
| 4.1 | m | Attaching the corner/base profile | | |
| 4.2 | piece | Reinforcing of the door and window openings with AQUAPANEL® Exterior Reinforcing Tape and/or exterior fabric (300 x 500 mm) | | |
| 5.1 | m ² | Basecoating of the entire surface with AQUAPANEL® Exterior Basecoat, entire surface reinforced with AQUAPANEL® Exterior Reinforcing Mesh | | |
| 6.1 | m ² | Priming of the surface with AQUAPANEL® Exterior Primer | | |
| 7.1 | m ² | Coating of the surface with AQUAPANEL® Exterior Silicon Synthetic Resin Plaster – white or AQUAPANEL® Exterior Dispersion Plaster – white | | |

3. Ceiling System

| Item | Unit | Specification | Individual price (€) | Total price (€) |
|------|----------------|---|----------------------|-----------------|
| 1.1 | m | Framework made from wooden single fixture mount, profile spacing o.c. distance 300/312,5mm | | |
| 1.2 | m | Framework made from metal, galvanized CD profiles, profile spacing o.c. distance 300/312,5mm | | |
| 2.1 | m ² | Insulation, pushed tightly between profiles to prevent sliding | | |
| 3.1 | m ² | AQUAPANEL® Cement Board Outdoor, fixed with AQUAPANEL® Maxi screws, joints filled with AQUAPANEL® Joint Filler – grey and reinforced with AQUAPANEL® Tape (10 cm), screws evened out with AQUAPANEL® Joint Filler – grey. | | |
| 4.1 | m ² | Priming of the wall surface with AQUAPANEL® Interior Primer | | |
| 5.1 | m ² | Coating of the area with AQUAPANEL® Joint Filler and Skim Coating – white, reinforcing of the entire surface with AQUAPANEL® Exterior Reinforcing Mesh | | |

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