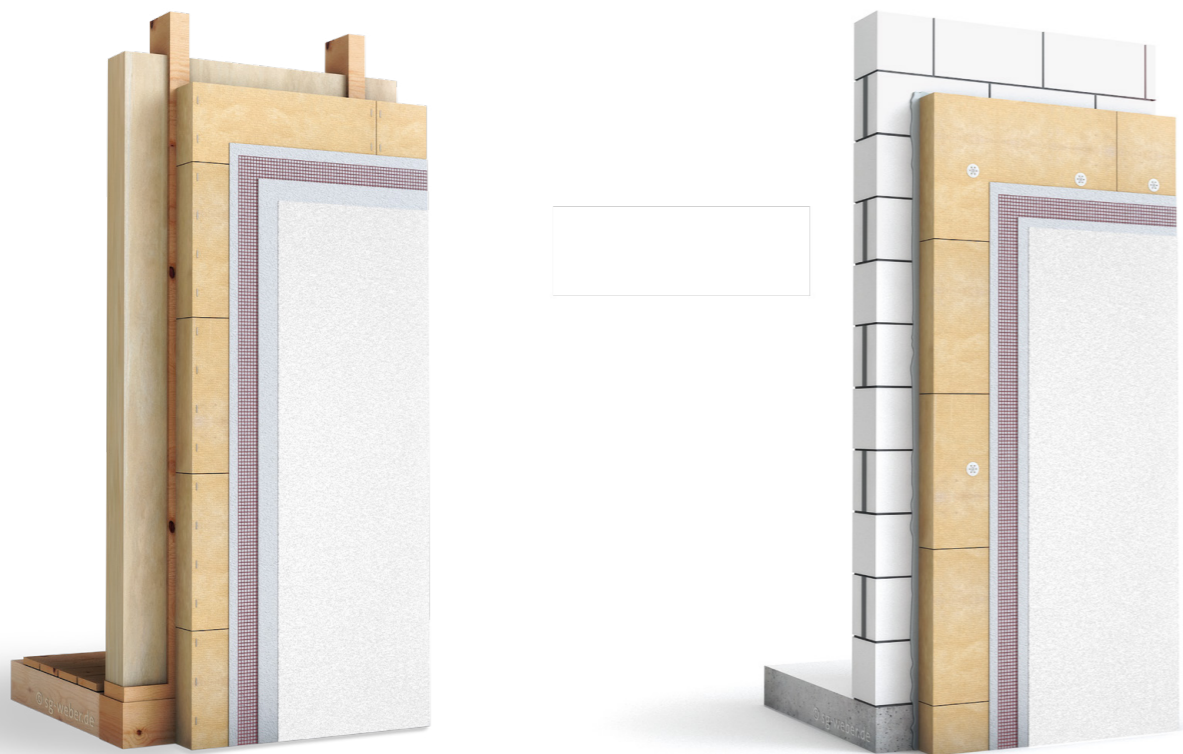


Etics weber.therm eco

Ecological Etics with soft wood fiber insulation boards

- Ideal for timber constructions
- Thin-layer mineral and organic top coat renders
- With AquaBalance technology: particularly resistant to algae and fungi growth



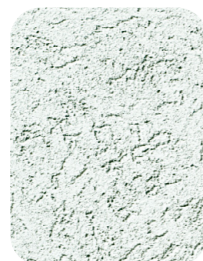
Scratch render fine-grained
Mineral scratch render with a fine-scratched texture.
Grain size: 1.5–3.0 mm



Scratch render granular
Mineral scratch render with an open and natural texture.
Grain size: 4.0 mm



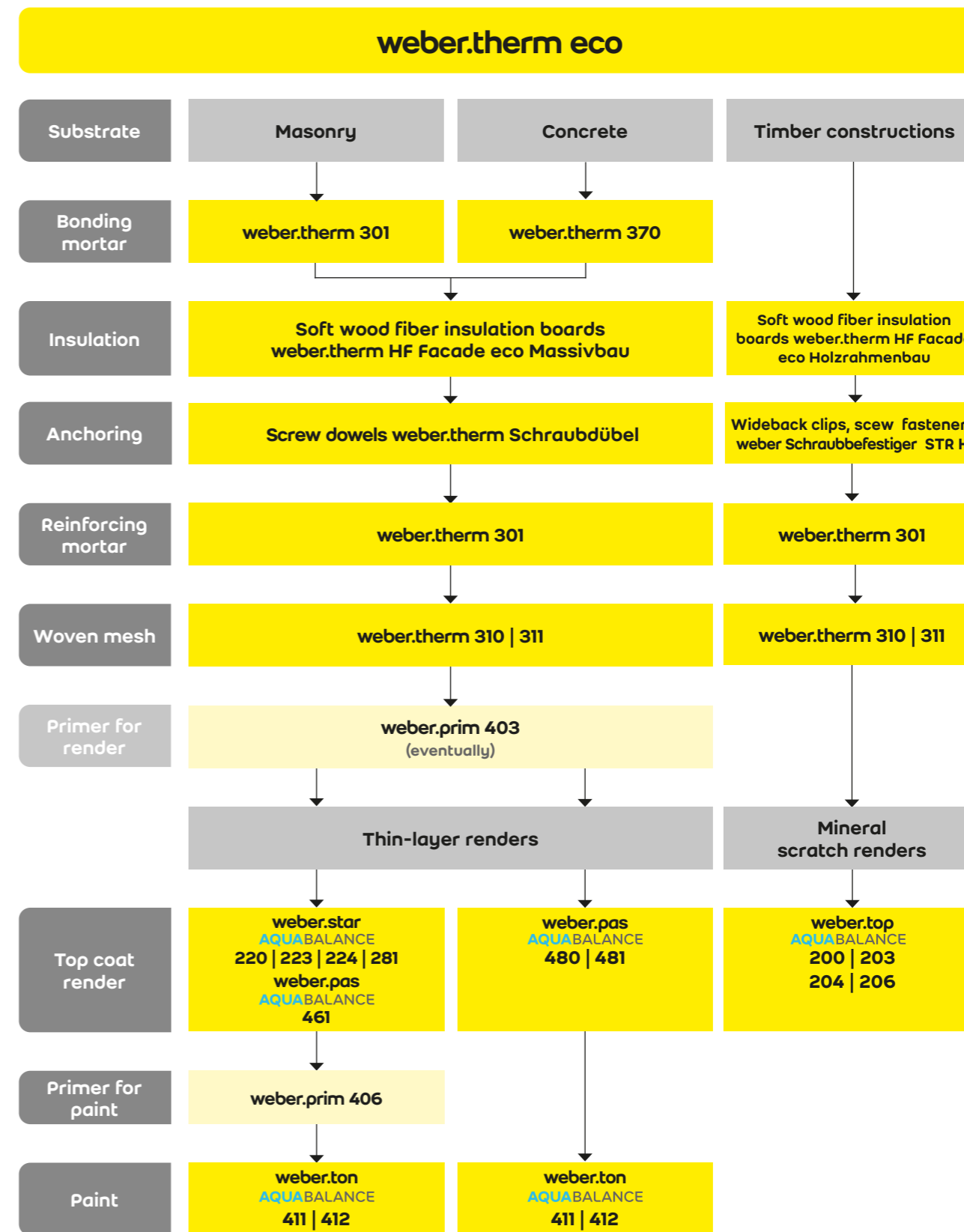
Floated render fine-grained
Floated render with a lively and granular texture. As mineral or organic render.
Grain size: 2.0–3.0 mm



Combed render
Mineral modellable render with modern textures (comb or broom texture)



Smoothed render
Mineral render for a fine-grained and smooth surface



The schematic presentation shows a simplified structure of the system with standard components; it cannot however replace expert advice on site. More extensive information concerning the system components is provided in the technical data sheets.

The type of substrate preparation and/or anchoring must be selected based on the requirements of the construction project. For additional information refer to the technical data sheets and/or request technical advice.



Etics with soft wood fiber insulation boards and selected overlay renders

Fields of application

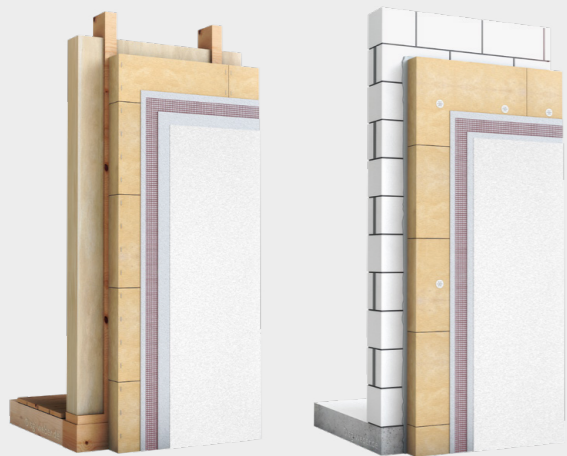
- ideal for all timber constructions
- massive system construction
- external insulation of new and old buildings

Main features

- open to water vapour diffusion
- provides a good acoustic effect
- allows easy laying of insulation boards

Consumption / yield

Bonding mortar	weber.therm 301/370	approx. 5.0 kg/m ²
Mechanical anchoring (timber constructions)	wideback clips, screw fasteners weber.therm Schraubefestiger	
Dowels	screw dowels weber.therm Schraubdübel	at least 4 pieces/m ² *
Reinforcing mortar	weber.therm 301	approx. 7.0 kg/m ²
Woven mesh	weber.therm 310/311	approx. 1.1 m ² /m ²
Primer	weber.prim 403 (eventually)	approx. 0.25 l/m ²
Top coat render	refer to technical data sheets	
Socket and perimeter insulation	weber.therm 370	approx. 5.0 kg/m ² (as bonding mortar)



* For full information relative to dowelling technology, number and location of dowels, request technical advice.

1. Range of application

- **weber.therm eco** is an external thermal insulation composite system (Etics) with soft wood fiber insulation boards and mineral top coat renders (EN 998-1) or organic top coat renders (EN 15824).
- It can be used for the thermal insulation improvement of new and old walls.
- Furthermore, the system is suitable for the repair of defective and cracked new and old facades.
- Allowed substrates: external walls of timber constructions, load-bearing timber constructions, norm-compliant or approved panel materials, massive wood-based panel formwork, massive timber substrates, concrete and masonry.

2. Homologations

- The Etics **weber.therm eco** is approved by the German Building Authorities (DIBt - Deutsches Institut für Bautechnik), which has delivered following approvals:
Z-33.43-1383 – massive constructions
Z-33.43-1489 – timber constructions
- The reaction to fire of the Etics **weber.therm eco** is B2 (non-combustible according to DIN 4102).
- Like for all Etics, comply with the national standards and/or guidelines relating to resistance to fire.
- The official approvals are only valid for the whole system. It is not allowed to replace any component of the system. The use of other components, which do not belong to the system, is not permitted; otherwise, the approval is no longer valid and the warranty of the manufacturer is deleted.

3. Product features of Etics components

3.1 Bonding and reinforcing mortars weber.therm

- **bonding and reinforcing mortar weber.therm 301**
- **bonding mortar weber.therm 370**

Refer to the technical data sheets.

weber.therm eco	HF 042 Facade eco Holzrahmenbau	HF 046 Facade eco Holzrahmenbau (tongue and groove)	HF 042 Facade eco Massivbau	HF 042 Leibung eco (reveal)
Thermal conductivity λ (DIN 4108) W/(m·K)	0.042	0.046	0.042	0.042
Raw density [kg/m ³]	approx. 160	approx. 190	approx. 160	approx. 160
Class of reaction to fire (EN 13501-1)	B2	B2	B2	B2
Water vapour diffusion resistance μ	3	3	3	3
Dimensions [cm]	130 x 60	130 x 60	83 x 60	125 x 59
Thickness [mm]	80–160	40–60	100–160	20–60

3.2 Insulation boards

3.2.1 Soft wood fiber insulation boards weber.therm HF eco

These boards are used on the external walls of facades.

3.2.2 Polystyrene boards for socket parts weber.therm EPS 032/035 Sockel

These boards have a general approval as perimeter insulation up to 3 meters under final ground level. Their use in pressure water or ground water is not allowed. Take the thermal conductivity additions into account due to ground moisture and non-pressure water.

weber.therm EPS Sockel	EPS 032 Sockel	EPS 035 Sockel
Thermal conductivity λ (DIN 4108) W/(m·K)	0.032	0.035
Class of reaction to fire (DIN 4102-2)	BI	BI
Class of reaction to fire (EN 13501-1)	E	E
Water vapour diffusion resistance μ	40/100	40/100
Dimensions [cm]	100 x 50	100 x 50
Thickness [mm]	60–200	60–200

3.3 Woven meshes weber.therm 310/311 (coarse/fine)

Both meshes consist of glass fiber with a high tear resistance according to EN 13496 and treated with an alkali-resistant impregnation.

Tear resistance (EN 13496)	weber.therm 310		weber.therm 311	
	weber.therm 310	weber.therm 311	weber.therm 310	weber.therm 311
Tear resistance when delivered [N/5 cm]	> 2.000	> 2.000	> 2.000	> 2.000
Tear resistance after alkaline stress [N/5 cm]	> 1.300	> 1.000	> 1.300	> 1.000
Weight [g/m ²]	approx. 200	approx. 160	approx. 200	approx. 160
Mesh size [mm]	approx. 8 x 8	approx. 4 x 4	approx. 8 x 8	approx. 4 x 4
Colour	wine red	wine red	wine red	wine red

3.4 Dowels / Fasteners weber.therm

The dowels **weber.therm** are used to ensure stability in case of soft wood fiber insulation boards.

Dowels	
Timber constructions	screw fasteners weber.therm Schraubefestiger STR H
Massive constructions	screw dowels weber.therm Schraubdübel
Plate diameter [mm]	60
Shaft diameter [mm]	8
Anchoring depth (h _{ef}) [mm]:	25–65, according to substrate type
Reduction of u-value [W/m ² ·K]:	< 0.002
Use:	screw dowels with general technical approval for ensuring the stability
Timber constructions:	stainless steel wideback clips

Follow the recommendations of the supplier of soft wood fiber insulation boards in case of timber constructions.

3.5 Universal primer weber.prim 403

The primer is mainly used to regulate the hydrological balance of the thin-layer top coat renders. Moreover, their absorbency is equalized and their adhesion with post-applied products is improved. The primer makes the application of the top coat render easier. It is also possible to pre-treat the reinforcement layer by pre-wetting.

3.6 Overlay (top coat) renders

The following mineral or organic renders can be used: **weber.top 200/203/204/206 AquaBalance** scratched renders
weber.star 220/221/223/224 AquaBalance floated renders
weber.star 240 AquaBalance rilled render
weber.star 261 AquaBalance smoothed render (freestyle effect render upon request)
weber.pas 461 AquaBalance floated render based on silicate resin
weber.pas 480/481 AquaBalance floated renders based on silicone resin

Characteristics of organic top renders (weber.pas)	
Water absorption coefficient w [kg/m ² ·vh]	< 0.5
Water vapour diffusion resistance μ	60–150
Binder	water-borne dispersion of polymers, waterglass (only weber.pas 460/461 AquaBalance)

Characteristics of mineral top coat renders (weber.star)	
Strength class / mortar group	CS I bzw. CS II/Plc
Compressive strength [N/mm ²]	> 1
Water absorption coefficient w [kg/m ² · v/h]	< 0.5
Water vapour diffusion resistance μ	≤ 20
Class of reaction to fire	A1
Binder	white hydrated lime, white cement

The lightness reference value of the top coat renders should be ≤ 20. Additional information is provided in the technical data sheets and application tips of the concerned products.

3.7 Accessories

A number of accessory items are available for correct processing of the whole system:

- **weber.therm 312** ultra-solid mesh for corner reinforcement
- **weber.therm 313** coarse mesh for corner reinforcement with PVC profile (mesh size 8 x 8 mm)
- **weber.therm 315** arrow-shaped glass fiber element for diagonal reinforcement of angles (33 x 40 cm)
- **weber.therm 342** dowel for skirting profile (starting rail)
- **weber.therm 345** PU foam (resistance to fire B1) for filling small joints between insulation boards
- **Frame-seal beads** for window connections
- **Decor profiles** for facade design
- **Render profiles** for corners and stop-ends

4. Working instructions

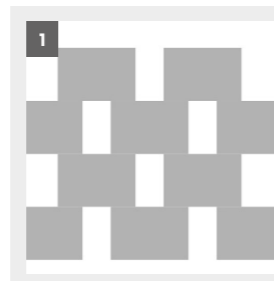
4.1 Preliminary conditions

Respect following demands prior to the begin of installation of the Etics:

- The substrate must be load-bearing, sufficiently dry and level. Dirt, dust and loose parts must be removed. Concrete surfaces must be free of residues of separating formwork oil, eventually by removal with steam-blasting.
- The insulation boards must be stored and applied in dry conditions; their moisture content must be max. 16%.
- The evenness (flatness) of the substrate must comply with the allowed tolerances (variations) defined by the national standards and/or guidelines (for ex. norm DIN 18202 „Tolerances in Building Constructions“). If necessary, take the appropriate remedial measures for levelling unsuitable substrates; in case of doubt request technical advice.
- Horizontal coverings, such as window sills, roof terminations, parapet covers etc. must be installed.
- Expansion joints of the building structure must be taken over within the whole Etics. Intermediate joints (used for dividing large surfaces into smaller ones) must be installed under consideration of the prevailing facade structure. In all cases expansion joints are to be placed every 30 meters. Their dimensions must be similar in all layers of the system.
- The contractor should report concerns in case of
 - heavy contamination, efflorescence, excessively smooth surfaces, greater unevenness than allowed by the national guidelines
 - too high building moisture (e.g as a result of moisture-generating finishing works).
- All necessary waterproofing works related to the Etics must be completed prior to its installation.

4.2 Preliminary works

- Remove all residues of concrete and mortar.
- Flatness differences of ± 10 mm can be compensated during bonding (± 20 mm in case of additional dowelling).
- Unevenness of more than 10 mm (resp. 20 mm) must first be levelled out with the bonding mortar **weber.therm 300** or the light-weight lime-cement underlay render **weber.dur 132**. Alternative: use the reinforcing mortar **weber.therm 376** or the lightweight lime-cement underlay render with optimized setting and scratching properties **weber.dur 137 SLK**. Allow the levelling layer to dry at least 1 week before bonding insulation boards.
- Carefully check if there are hollow parts within the old renders; if necessary, remove such parts and over-work them (substrate and old render) with the underlay render **weber.dur 132**. Clean substrate and old render, eventually pre-wet them.



- Whenever the old organic paint or render is load-bearing, insulation boards can be glued after substrate cleaning. Whenever these substrates are not load-bearing, their surface must be opened in a checkboard pattern and removed by at least 70% by steam-blasting or sand-blasting (**drawing 1**).
- In case of timber construction comply with the supplier's recommendations for the insulation boards.

recommendations for the insulation boards.

4.3 Starting rail on the upper socket parts



Two possibilities exist:

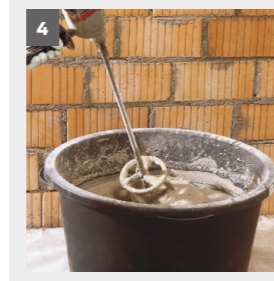
a) Skirting aluminium rail with U-shaped profile: it must match the panel thickness and be fixed with the profile dowels **weber.therm 342** (3 pieces per meter) (**picture 2**). In addition, the skirting rail can be fixed on its whole length with the profile bonding mortar **weber.mix 125**; this is particularly necessary on uneven substrates, in order to obtain a

flush and tight alignment of the lowest (bottom) row. Take care that the rails are not press-fitted due to warmth expansion.



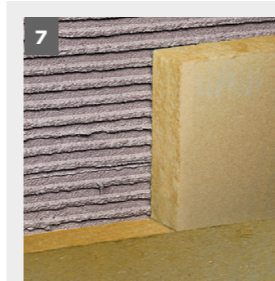
b) Starting rail without profile: fix the ultra-solid mesh for corner reinforcement **weber.therm 312** on the wall with the specific bonding mortar **weber.therm**, on which the insulation boards will be later bonded (**picture 3**). Afterwards place another piece of **weber.therm 312** on the front of the panels, so that the first row is enclosed in a U-shape mesh rail by the above-mentioned reinforcement.

4.4 Bonding or installation of insulation boards



Store the insulation boards away from humidity before use. Do not install drenched or defective boards. The bonding and reinforcing mortar **weber.therm 301** is convenient for gluing insulation boards. In case of poorly absorbent substrates (for ex. dense concrete or brickwork) use the bonding mortar **weber.therm 370**. Mix the bag content of the mortar with the specified water quantity,

using an electric drill and an appropriate stirrer until the right consistency is obtained (**picture 4**).

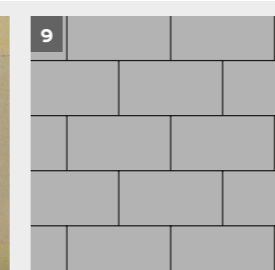


The mortar can be applied by all conventional render machines (with mixing, conveying and spraying equipment). For the application of the bonding mortar on the insulation boards, a special glue gun can be used, e.g PFT or Putzmeister. Apply the bonding mortar all around the soft wood fiber insulation boards **weber.therm HF eco** in a frame shape and in 3 vertical

strips on their backside (**picture 5**).

Apply so much mortar that a contact surface with the substrate of at least 60% is obtained after pressing the boards onto the fresh bonding mortar. Alternative: the mortar can be applied full-surface with a notched trowel (10 x 10 mm) on the backside of the insulation boards (**picture 6**).

In case of timber construction comply with the supplier's recommendations related to the insulation boards. Alternative: the mortar can be sprayed full-surface on the backside of the insulation boards and combed with a notched trowel (10 x 10 mm). Immediately after mortar application, position the boards without delay (within max. 10 minutes after spraying or less according to substrate and climatic conditions), press on and float them by horizontal movements (**picture 7**).

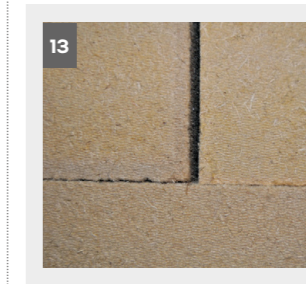
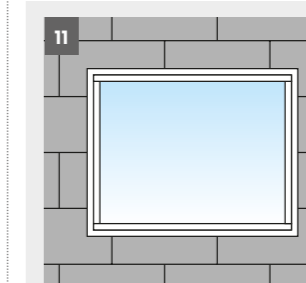


The bonding of boards always begins at one angle of the lowest part of the facade. All further boards are laid butt-joint (i.e. without joint in-between) in successive rows, starting from the low level determined by the starting rail and with a general offset of at least 30 cm in each part (**pictures 8 + 9**).

Also at the angles the boards are laid offset; in this case the board edge must be protruding over the mortar bed (**picture 10**).



Etics with soft wood fiber insulation boards and selected overlay renders



Whenever the installation of the window sill is not tight against rain, a second waterproofing layer must be planned with the stop-end for window sill **weber.therm Sol Pad** and the 2-comp. waterproofing coating **weber.tec Superflex D 2**.

As a rule, a pre-compressed joint sealing tape must be installed in all angles and at all wall openings (doors and windows)

between insulation boards and the building parts (**picture 12**). Do not put mortar into the joints between the boards so as to avoid thermal bridges. Even in case of correct processing, it is not always possible to avoid joints in such areas. Always fill the joints with the same insulation material; fill small spaces (max. 0.5 cm) between insulation boards with the PU foam **weber.therm 345** (**picture 13**).

4.5 Anchoring

After a drying time of at least 3 days the works for the reinforcement layer and the dowelling can begin. As a rule the soft wood fiber insulation boards **weber.therm HF eco** must be mechanically fixed with the approved dowels **weber.therm** (**pictures 14 + 15**).





Etics with soft wood fiber insulation boards and selected overlay renders

Massive constructions

In case of buildings with a height of max. 7 meters plan 6 dowels per m² and 10 dowels on all four sides of the perimeter.

Timber constructions

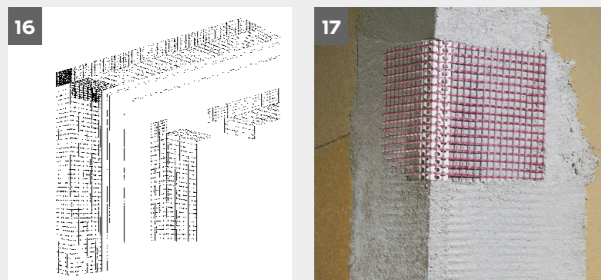
In case of buildings with a height of max. 7 meters plan 6 dowels per m² and 10 dowels per m² in corner areas. When using stainless steel backside clips use 16 pieces per m² with a maximal vertical interval of 125 cm.

In case of timber constructions follow the application recommendations of the board supplier which are mentioned in the official approval.

When dowelling through the mesh fix the dowels through the fresh layer of reinforcing mortar immediately after the mesh embedment. The reinforcement layer is not allowed to harden prior to dowelling. Afterwards cover the dowel heads with the reinforcing mortar.

4.6 Design of corners and profiles

At building corners and at window corners use the ultra-solid mesh for corner reinforcement **weber.therm 312** with the bonding and reinforcing mortar (picture 16). For prevention of cracks in the areas of window sills, window reveals and other wall openings cut **weber.therm 312** to the required dimensions and glue it with the reinforcing mortar (picture 17) on the insulation boards. Alternative: the coarse mesh for corner reinforcement with PVC profile **weber.therm 313** must be fixed with the reinforcing mortar at the angles (picture 17).



For prevention of cracks in angles the arrow-shaped glass fiber element for diagonal reinforcement of angles **weber.therm 315** or a piece of woven mesh cut to required dimensions (approx. 60 x 25 cm) are embedded in the reinforcement layer (picture 18). In addition, a piece of the ultra-solid mesh for corner reinforcement **weber.therm 312** must be added inside the door reveal, in order to obtain full-length reinforcement. Render profiles are fixed with the profile bonding and installation mortar **weber.mix 125** under consideration of the thickness of the chosen



render system either directly onto the ultra-solid mesh for corner reinforcement **weber.therm 312** or on the reinforcement layer (picture 19). Install a transition between window frame and render with an appropriate frame-seal bead with glass fiber mesh and integrated joint sealing tape, for ex. **weber.therm Gewebeanputzleiste W 29** or **W 36** (picture 20).

4.7 Reinforcing works

Combination woven mesh / reinforcing mortar	
	weber.therm 301
weber.therm 310/311	+
Thickness of reinforcement layer	5-8 mm

Protect the glued boards from heavy moisture ingress. Mix the bonding and reinforcing mortar as described above. It is applied in a thick layer on the insulation boards and ruled level (picture 21).

Then lay the woven mesh in vertical or horizontal wrinkle-free strips across the whole surface. Gently press the mesh with a flat trowel. The strips must overlap by at least 10 cm (picture 22).



Afterwards the mesh must lie in the upper half of the reinforcement layer. Pay attention that the overlapping mesh strips do not coincide with other mesh reinforcements in corner areas of windows and other wall openings. The mesh is brought flush to the corners of the building. Rule level the mortar to a flat, rough and in-plane surface with a wooden float (do not smooth it). During these operations it is neither allowed to expose the woven mesh nor to let a sinter skin deposit (picture 23).

A separation between reinforcing mortar and window sill must be carried out. Plan appropriate joints for separation of adjacent building parts from the built-in render system.

Window reveals, decorative offset frames and jambs, render stop-end strips

In such areas use the lightweight mineral fine-grained overlay render **weber.star 261 AquaBalance** in 2 - 3 mm thickness on the reinforcing mortar. Without delay work to a floated or smoothed texture. After sufficient drying, apply the silicate paint **weber.ton 411 AquaBalance**.

4.8 Overlay (top coat) renders

Respect a drying time of at least 7 days after application of the reinforcement layer and prior to application of the overlay renders. Depending on climatic conditions and type of finish top coat, the reinforcement layer can be pre-wetted (preferably the day before). Alternative: the universal primer **weber.prim 403** can be applied in case of thin-layer overlay renders. The overlay render can be applied by hand or appropriate render machine. Respect the specific instructions in the technical data sheets for the application of overlay renders. After appropriate waiting time use the silicone paint **weber.ton 411 AquaBalance** on the facade.

4.9 Perimeter insulation and socket part insulation

Perimeter and socket building parts are subject to higher mechanical and moisture loads; for their insulation other materials fulfilling these demands in the long term must be taken into consideration.

In general, following alternatives for the insulation design of these areas are possible:

- a) The socket part is not deep under the ground level (drawing 24)
- b) The socket insulation is brought downwards as perimeter insulation (drawing 25).

Conditions:

- The Etics has no waterproofing function.
- The necessary vertical and horizontal waterproofing must have been carried out.
- Precipitation water must be diverted from the facade by taking appropriate measures (for ex. installation of capillary layer or permeable gravel bed). The paving stones and slabs around the building must be laid with a sufficient slope and be separated from the building so as to facilitate the water drainage.

Bonding of insulation boards

The socket polystyrene insulation boards **weber.therm EPS Sockel** are bonded with the system-compliant mortar or (in the case of bitumen waterproofing on the socket part) with the bonding mortar **weber.therm 370**, applied around the board and in 3 vertical beads on its backside. Apply so much mortar that a contact surface with the substrate of at least 50% is obtained after pressing the boards. The insulation boards located in the earth are glued dotwise (at least 6 dots per panel).

Use the drive-in dowels **weber.therm Schlagdübel** (4 pieces per m²) on the bitumen-covered parts above ground level so as to prevent the boards from sliding during the backfilling work. If the socket part is not deeply located in the earth, cut the board at a 45° angle at its low side.

Reinforcing mortar for areas with low impact

After hardening of the bonding mortar apply a layer of the reinforcing mortar **weber.therm 300**, as described above. This layer is brought up to approx. 30 cm below the intended final ground level (case b) or on the substrate (case a).

Reinforcing mortar for areas with high impact

After sufficient hardening of the first reinforcement layer, apply a second one with the same reinforcing mortar, if higher mechanical loads are expected. Alternative: mineral building boards can be installed on the perimeter insulation boards, prior to application of the reinforcement layer. Also the bonding of ceramic clinker slips on the first reinforcement layer is another possibility. For more information refer to the application tip „Execution of socket and perimeter areas in case of ETCS“.

Overlay (top coat) renders

Next day apply a layer of the bonding and reinforcing mortar **weber.therm 300** as overlay render, rule level and texture to a smooth finish. Alternative: after drying of the reinforcing mortar apply the lime-cement render **weber.star 295** in a thickness of approx 3 - 5 mm.

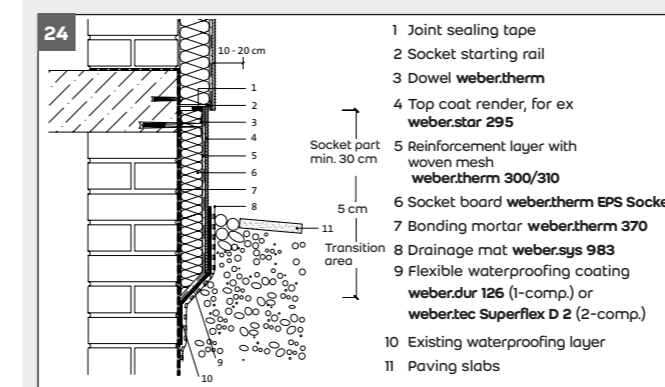
After drying of the previous render layer it is recommended to reinforce its hydrophobic behaviour in the upper socket part (facade parts above ground level) by applying the silicate resin paint **weber.ton 410 AquaBalance** or the silicone resin paint **weber.ton 411 AquaBalance**.

Instead of **weber.star 295**, the organic top coat render with exposed natural stones **weber.pas 434** can be used after application of the adequate primer.

In earth-contacting building parts apply the flexible waterproofing coating **weber.dur 126** (1-comp.) or **weber.tec Superflex D 2** (2-comp.). Beforehand roll out a protection and drainage mat (for ex. **weber.sys 983**) or a drainage board so as to protect earth-contacting surfaces from loads and damages during the backfilling of the excavation pit.

Comply with the national standards and/or guidelines relating to all works described in this document; if necessary, request technical advice.

Massive constructions



Timber constructions

