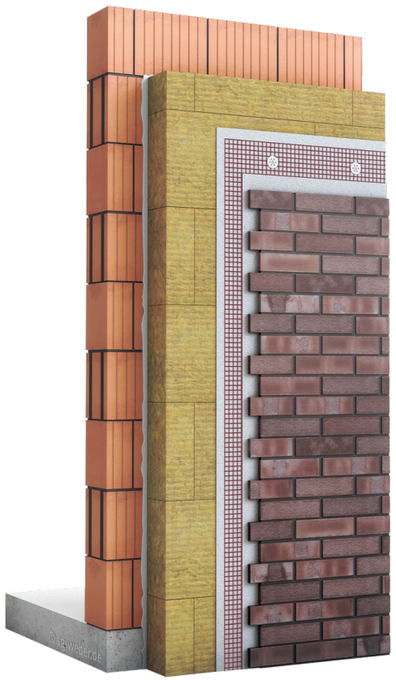
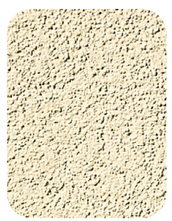
Etics weber.therm AK 500/BK 500

Etics with mineral wool or polystyrene insulation boards for ceramic covering and combined facades with render/clinker

- Non-combustible (AK 500) / hardly flammable (BK 500)
- Impact-resistant shell of ceramics or clinker brick slips
- Also in combination with high-quality top coat renders



Best suited for combinations of clinker brick slips and premium facade renders

Floated render	Throw-on render	Smoothed render	Combed render	Scratch render
				

weber.therm AK 500 / BK 500

Substrate	Masonry (old / new buildings)	Concrete
Bonding	weber.therm 300 | 301	weber.therm 370
Insulation	Polystyrene insulation boards weber.therm EPS 035 | 031 Facade	Mineral wool lamella insulation boards weber.therm MW Facade
	Ceramic covering or clinker facade	Combined facades ceramic/clinker + render
Anchoring		Dowels weber.therm
Reinforcing mortar	weber.therm 300 | 301	weber.therm 300 | 301
Woven mesh	weber.therm 310	weber.therm 310
Anchoring	Dowels weber.therm through woven mesh ((see section 4.5 „Anchoring")	
Laying of ceramics	weber.therm 370	
Ceramics, clinker, top coat render	Ceramic covering or clinker brick slips Free product choice. Respect minimum specifications according to section 3.8	Mineral scratch renders / Thin-layer mineral and silicate renders / Thin-layer organic renders
Grouting of ceramics	Grout weber.therm 371 (with hard rubber board or pointing trowel)	Suitable Etics weber.therm A 100/B 100

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 weber.therm AK 500 + BK 500

Facade / Wall

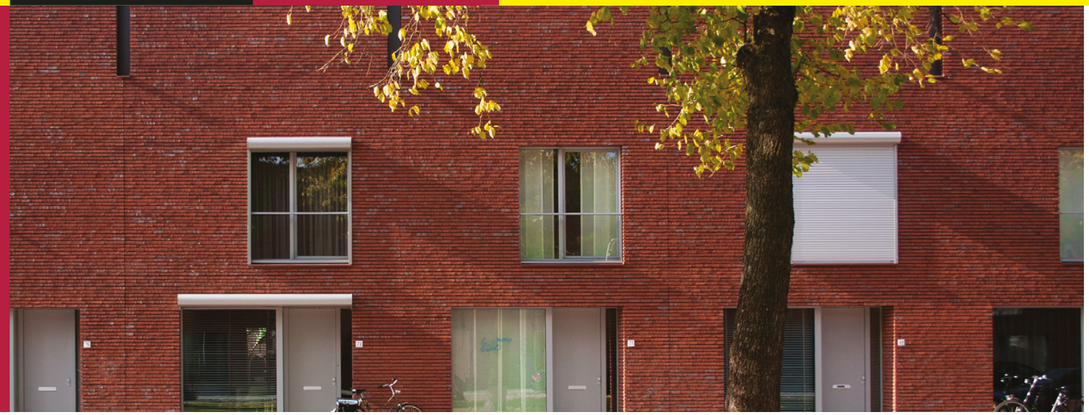


Foto: Jeroen Mak (BdB)

Etics with ceramic coverings and mineral overlay renders

Fields of application

- thermal insulation with a wide range of design
- thermal insulation of old and new buildings
- also for combined facades with ceramics/clinker + render

Main features

- wide range of insulation boards for each application field
- impact-resistant shell of ceramics
- seamless and jointless insulation layer

Consumption / yield

Bonding mortar	**weber.therm 300, 301**	approx. 5.0 kg/m²
	weber.therm 370	approx. 5.0 kg/m²
Dowels	**weber.therm**	at least 4 pieces/m²*
Reinforcing mortar	**weber.therm 300, 301**	approx. 7.0 kg/m²
Woven mesh	**weber.therm 310**	approx. 1.1 m²/m²
Grout	**weber.therm 371 EF/SF****	approx. 3.0-5.0 kg/m²
Socket and perimeter insulation	**weber.therm 370**	approx. 5.0 kg/m² (as bonding mortar)

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

** EF: pointing trowel
SF: hard rubber float

1. Range of application

- **weber.therm AK 500** and **BK 500** are external thermal insulation composite systems (Etics) with mineral wool or polystyrene insulation boards.
- They can be used for the thermal insulation improvement of new and old walls.
- As surface finish mineral top coat renders and ceramic coverings (for ex. clinker brick slips) can be used.
- Both systems improve the thermal insulation and the moisture balance of walls in old and new buildings.
- A combination with mineral overlay renders is possible and opens up a new design potential with a seamless insulation layer.
- The system **BK 500** (reaction to fire B 1) is allowed for buildings with a height of approx. 22 meters; the system **AK 500** can be used on higher buildings.
- Concrete and masonry are allowed substrates.

2. Homologation

- The Etics **weber.therm AK 500** and **BK 500** are approved by the German Building Authorities (DIBt - Deutsches Institut für Bautechnik), which has delivered an approval under the number **Z-33.46-568.**
- Like for all Etics, comply with the national standards and/or guidelines relating to resistance to fire.
- The official approval is 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 300**
- **bonding and reinforcing mortar weber.therm 301**

Refer to the technical data sheets.

3.2 Insulation boards

3.2.1 Polystyrene insulation boards weber.therm EPS and mineral wool lamella insulation boards weber.therm MW

weber.therm AK 500 / BK 500					
weber.therm MW / EPS	**MW 041 Facade speedy**	**MW 035 Facade express**	**EPS 035 Facade standard**	**EPS 034 Facade standard**	**EPS 032 Facade standard**
Thermal conductivity λ (DIN 4108) W/(m·K)	0.041	0.035	0.035	0.034	0.032
Class of reaction to fire (DIN EN 13501-1)	A1	A1	E	E	E
Water vapour diffusion resistance μ	1	1	20/50	20/50	20/50
Dimensions [cm]	120 x 20	80 x 62,5	100 x 50	100 x 50	100 x 50
Thickness [mm]	40–200	60–200	20–200	20–200	20–200
Colour	–	–	white	grey	grey

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 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 mesh weber.therm 310 (coarse)

The bonding and reinforcing mortar **weber.therm 300** or **weber.therm 301** are applied with the woven mesh **weber.therm 310** and provide a performing and solid reinforcement layer. The mesh consists of glass fiber with a high tear resistance according to EN 13496 and is treated with an alkali-resistant impregnation.

Tear resistance EN 13496	
When delivered [N/5 cm]	> 2.000
After alkaline stress [N/5 cm]	> 1.300
Weight [g/m²]	approx. 200
Mesh size [mm]	approx. 8 x 8
Coulour	wine red

3.4 Dowels weber.therm

The dowels **weber.therm** are used to ensure stability. The dowelling works are done through the mesh (refer to section 4.5).

Plate diameter [mm]	60
Shaft diameter [mm]	8
Anchoring depth (h_{ef}) [mm]	25–65, according to substrate type
Reduction of u-value [W/m² · K]	< 0.002
Use	screw dowels with general technical approval for ensuring the stability

3.5 Bonding mortar weber.therm 370

weber.therm 370 is a cement-based thin-bed adhesive according to EN 12004. It has an extreme adhesion and elasticity and is therefore particularly suitable for bonding ceramic coverings on Etics.

3.6 Grout weber.therm 371

weber.therm 371 SF (hard rubber board application) or **weber.therm 371 EF** (pointing trowel application) is a mineral mortar, which is used for grouting the joints of the ceramic coverings on **weber.therm** facades. After setting, it is weather-resistant, frost-resistant and highly water repellent. It is characterized by a strong adhesion on the sides of the joints, if the application instructions are followed. The proportion of joints per m² should be ≥ 6% of the surface.

3.7 Primer and top coat renders

Refer to the explanations given in the documents about the Etics **weber.therm A 100** and **weber.therm B 100.**

3.8 Ceramic coverings and clinker brick slips

Clinker brick slips, tiles or slabs may be used as ceramic covering in accordance with EN 14411 as well as unglazed brick and clinker brick slips in accordance with DIN 105-100 may be used. They must be frost-resistant in accordance with EN ISO 10545-12. The individual ceramic covering must not exceed a surface of 0.12 m² and the edge length of 0.4 m. Its thickness is limited to 15 mm. The frequency distribution of the pore sizesmust have a maximum at pore radii of > 0.2 μm. The pore volume must be 20 mm³/g. The water absorption w in accordance with EN ISO 10545-3 of the ceramic coverings or clinker brick slips must not exceed 16.0 %. Black or very dark ceramic coverings or clinker brick slips are not suitable.

3.9 Accessories

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

- **weber.therm 312** ultra-solid mesh for corner reinforcement (6 x 10 mm)
- **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)
- **Frame-seal beads** for window connections
- **weber.therm 345** PU foam (reaction to fire B1) for filling small joints between insulation boards
- **Decor profiles** for facade design
- **Render profiles** for corners and stop-ends

4. Working instructions

4.1 Preliminary conditions

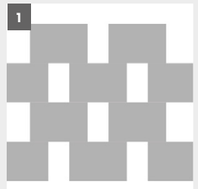
Respect following demands prior to the begin of installation of the Etics:

- 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 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 application.

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 lightweight 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.

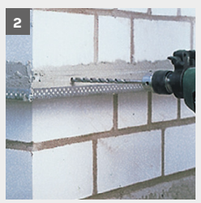
1



- 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).**

4.3 Starting rail on the upper socket parts

2



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)** and installed with the skirting rail connectors **weber Sockelverbinder** (delivered in the kit **weber.therm Befestigungsset**).

In addition, the skirting rail can be fixed on its whole length with the profile bonding and installation 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.

3

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**, with 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 of insulation boards

Store the insulation boards away from humidity before use. Do not install drenched or defective boards. The bonding and reinforcing mortars **weber.therm 300/301** are 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 mortars can also 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.

4

5.1

5.2

Apply the bonding mortar all around the insulation boards **weber.therm** in a frame shape and in 3 vertical strips on their backside **(pictures 5.1 + 5.2).** Apply so much mortar that a contact surface with the substrate of at least 50% is obtained after pressing the boards onto the fresh bonding mortar.
In case of mineral wool lamella insulation boards the bonding mortar is applied full-surface onto the boards **(picture 6).** For a quicker installation the mortar can be sprayed in vertical strips (approx. 5 cm wide and 1.5 - 2 cm thick) **(picture 7).**

6

7

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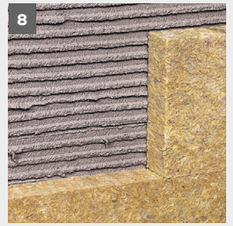

The distance between the mortar beads should not exceed 10 cm; a contact surface with the substrate of at least 50% must be obtained after pressing the boards onto the fresh bonding mortar.
Alternative: the mortar can be sprayed applied full-surface on the backside of the insulation boards and combed with a notched trowel (10 x 10 mm).
Immediately after its 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 8).**
Also at the angles the boards are laid offset; in this case the board edge must protruding over the building angle by the board thickness and the thickness of the mortar bed **(pictures 9.1 + 9.2).**

9.1

9.2

For reduction of cracks the insulation boards (except lamella boards) must de-coupled at the angles of openings (doors and windows), i.e no joint in-between must be prevailing in the angles **(drawing 10).** 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 sills **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 11).**

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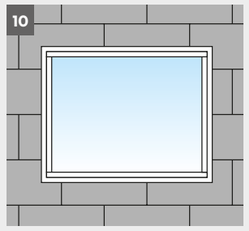

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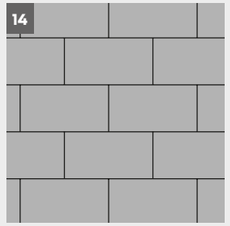
Do not put mortar into the joints between the boards so as to avoid thermal bridges. Even in case of correct processing, it is not always possible to avoid joints in such areas. Always fill the joints with the same insulation material **(picture 12).** Fill small spaces (max. 0.5 cm) between insulation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

12

13

Etics with ceramic coverings and mineral overlay renders

14



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 lowest one determined by the starting rail and with a general offset of at least 25 cm in each part **(picture 14).**

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 systems **weber.therm AK 500** and **BK 500** are exclusively fixed with the approved dowels **weber.therm.**

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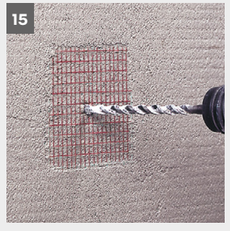


Generally, the doweling is done through the woven mesh. In this case the dowels must be installed immediately after the mesh has been laid. The mortar is not allowed to stiffen Afterwards the dowel heads are covered with the reinforcing mortar **(picture 15).**

For full information about number and location of dowels request technical advice.

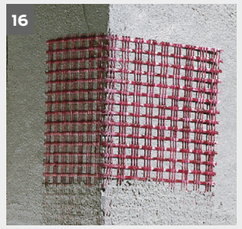
Insulation board **weber.therm**	Plate diameter [mm]	Dowelling under woven mesh	Dowelling through woven mesh
EPS	60	(X)	X
MW	60	–	X

Etics with ceramic coverings and mineral overlay renders

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.

16



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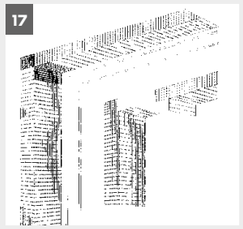

Alternative: the coarse mesh for corner reinforcement with PVC profile **weber.therm 313** must be fixed with the reinforcing mortar at the angles **(picture 18).**
For prevention of cracks in angles the arrow-shaped glass fiber element for diagonal reinforcement of angles **weber.therm 315** or a piece of woven mesh cut to required dimensions (approx. 60 x 25 cm) are embedded in the layer of reinforcing mortar **(picture 19).** 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 a full-length reinforcement there, too.

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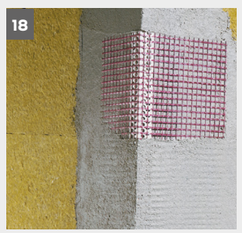

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Combination woven mesh / reinforcing mortars	
Reinforcing mortars	**weber.therm 300 / 301**
Woven mesh	**weber.therm 310**
Thickness of reinforcement layer	5–8 mm

4.7 Reinforcing works

Protect the glued boards from too heavy humidity ingress. Mix the bonding and reinforcing mortar as described above. It is applied in a 7 mm thick layer on the insulation boards and ruled level **(picture 20).** Afterwards 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 21).**

20

21

Afterwards the mesh must lie in the upper half of the mortar. Pay attention that the overlapping mesh strips do not coincide with other mesh reinforcements in corner areas of windows and other wall openings. At the corners of the building, the mesh is brought flush up to the corners. In case of thick-layer overlay renders (range of scratch renders **weber.top**) roughen the reinforcing mortar, using for ex. a hard broom **(picture 22).**
In case of other overlay renders 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 a window sill must be installed. Plan appropriate joints for separation of adjacent building parts from the built-in render system.

22

23

Fire protection

For the system **weber.therm BK 500** supplementary measures for the fire protection must be taken. Refer to the homologation Z-33.46-568 and/or request technical advice.

4.8 Primers and overlay (top coat) renders

Refer to the explanations given in the documents about the Etics **weber.therm A 100** and **B 100.**

4.9 Ceramic coverings and clinker brick slips

Bonding is carried out with the bonding mortar **weber.therm 370** according to the buttering-floating method; it is applied on the reinforcement layer and also on the back of the ceramic coverings **(photo 24).** The grouting is carried out with the mortar **weber.therm 371 (photo 25).**

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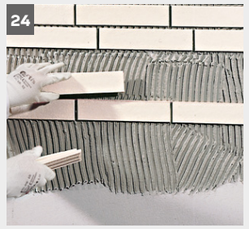


25

- Always use the same amount of water from one mixture to the next, to avoid colour differences.
- Depending on the desired consistency, mix the bag content with clean water, using an electric drill and a suitable stirrer until a homogeneous, lump-free mortar is obtained (respect the specific water demand).
- If necessary, the mortar can be re-beaten from time to time with the trowel or the electric drill + stirrer without adding water.
- Work the mortar deeply and flush with the joints with a pointing trowel (vertical joints) or with a hard rubber float (horizontal joints). After a few minutes, add a little mortar to the joints and remove the excess in diagonal passes.
- Check with your finger whether the mortar has hardened sufficiently to be cleaned. Use a latex sponge or a sponge float for this. Then clean the coating with clean water.
- If a mortar film remains, clean with a slightly damp sponge.
- Keep the mortar moist to prevent its surface from drying out in case of adverse weather conditions.

For further information refer to the technical data sheet of **weber.therm 371.**

4.10 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 26)**
b) The socket insulation is brought downwards as perimeter insulation **(drawing 27).**

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 which are located in the earth, are glued in dots (at least 6 dots per panel).
Use the drive-in dowels **weber.therm Schlagdübel** (4 pieces/m²) on the bitumen-covered building 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

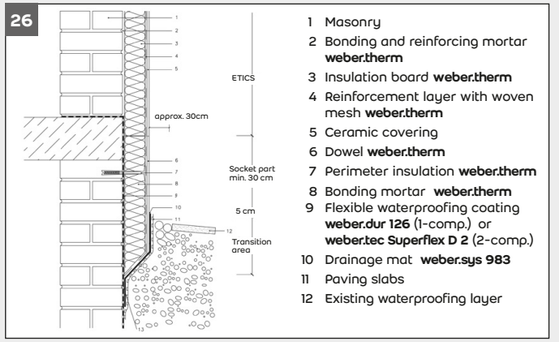
After hardening of the bonding mortar, lay a reinforcement layer with **weber.therm 300** + woven mesh, as described above. This layer is brought up to approx. 30 cm below the expected final ground level (case b) or on the substrate (case a).

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

Ceramic coverings and clinker brick slips

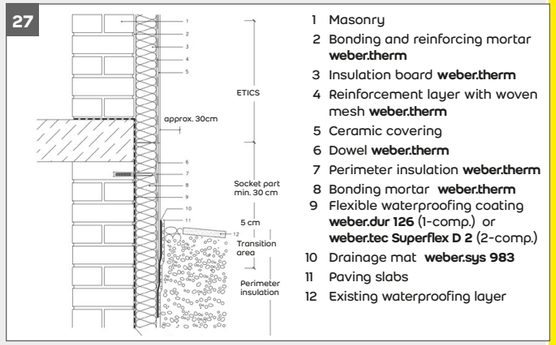
Refer to the pre-said recommendations of the 4.9.

26



1 Masonry
2 Bonding and reinforcing mortar **weber.therm**
3 Insulation board **weber.therm**
4 Reinforcement layer with woven mesh **weber.therm**
5 Ceramic covering
6 Dowel **weber.therm**
7 Perimeter insulation **weber.therm**
8 Bonding mortar **weber.therm**
9 Flexible waterproofing coating **weber.dur 126** (1-comp.) or **weber.tec Superflex D 2** (2-comp.)
10 Drainage mat **weber.sys 983**
11 Paving slabs
12 Existing waterproofing layer

27



1 Masonry
2 Bonding and reinforcing mortar **weber.therm**
3 Insulation board **weber.therm**
4 Reinforcement layer with woven mesh **weber.therm**
5 Ceramic covering
6 Dowel **weber.therm**
7 Perimeter insulation **weber.therm**
8 Bonding mortar **weber.therm**
9 Flexible waterproofing coating **weber.dur 126** (1-comp.) or **weber.tec Superflex D 2** (2-comp.)
10 Drainage mat **weber.sys 983**
11 Paving slabs
12 Existing waterproofing layer