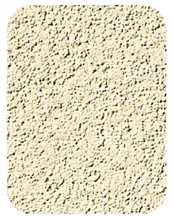
Etics weber.therm plus ultra

High-performance Etics with phenolic hard foam insulation boards and mineral or organic overlay renders

- High-performance insulation material with thermal conductivity of 021
- Very slim system build-up
- With AquaBalance technology: particularly resistant to algae and fungi growth

Floated render
With a lively and granular texture. As mineral or organic render. Grain size: 1.5–3.0 mm

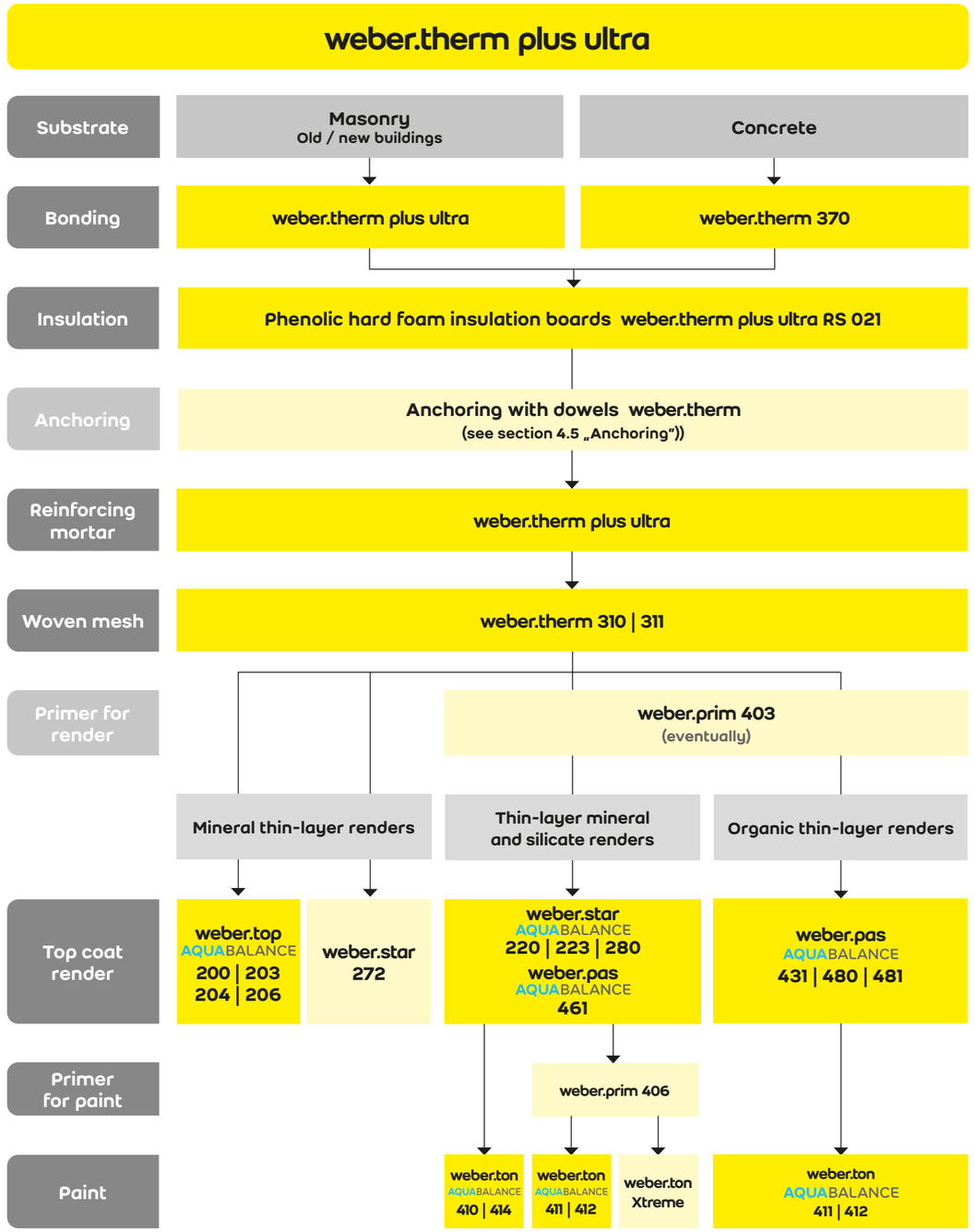


Scratch render fine-grained
Mineral scratch render with a fine-grained surface. Grain size: 1.0–2.0 mm

Scratch render granular
Mineral scratch render with an open and natural texture. Grain size: 3.0–5.0 mm

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

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



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 high-performance phenolic hard foam insulation boards and thick-layer render build-up

Fields of application

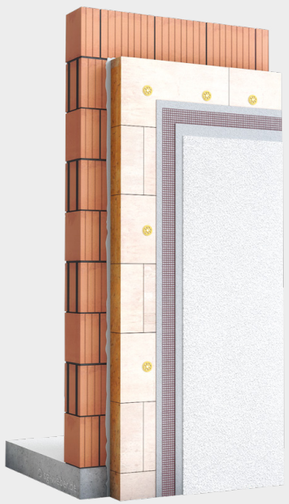
- ideal for high-performance constructions
- slim system build-up
- thermal insulation of old and new buildings

Main features

- solid, thick-layer render build-up with phenolic hard foam insulation boards
- suitable for insulation boards in a thickness over 100 mm without fire barriers
- high-performance insulation material (thermal conductivity of 021)

Consumption / yield

Bonding mortar	**weber.therm plus ultra/370**	approx. 5.0 kg/m²
Dowels:	**weber.therm**	at least 4 pieces/m²*
Reinforcing mortar	**weber.therm plus ultra**	approx. 7.0 kg/m²
Woven mesh	**weber.therm 310**	approx. 1.1 m²/m²
Primer	**weber.prim 403 (optional)**	approx. 0.25 l/m²
Top coat render	**refer to technical data sheets**	
Socket and perimeter insulation	**weber.therm 370**	approx. 5.0 kg/m² (as bonding mortar)



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

1. Range of application

- **weber.therm plus ultra** is an external thermal insulation composite system (Etics) with phenolic hard foam insulation boards and mineral top coat renders (norm EN 998-1) or organic top coat renders (EN 15824).
- It can be used for the thermal insulation improvement of new and old walls as well as undersides of building parts.
- The system is allowed for buildings with a height of max. 100 m. It is particularly suitable for facade insulation of buildings where a slim system build-up is required.
- Concrete and masonry are allowed substrates.

2. Homologations

- The Etics **weber.therm plus ultra** is approved by the German Building Authorities (DIBt - Deutsches Institut für Bautechnik), which has delivered following approvals:
  ETA-07/0258
  Z-33.43-1456 – as bonded and dowelled Etics
- The reaction to fire of the Etics **weber.therm plus ultra** is B1 (hardly-combustible according to DIN 4102).
- Like for all Etics, comply with the national standards and/or guidelines relating to fire resistance (external walls, indoors, socket parts).
- 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 mortar weber.therm

- **bonding and reinforcing mortar weber.therm plus ultra**
  Refer to the technical data sheet.

3.2 Insulation boards weber.therm

3.2.1 Phenolic hard foam boards (RS) weber.therm Resol

These boards are used on the external walls of facades.

Etics weber.therm plus ultra	weber.therm RS 021 Facade Leibung (reveal) plus ultra	weber.therm RS 021 Facade plus ultra
Thermal conductivity λ (DIN 4108) W/(m·K)	0,022 (bis 44 mm)	0,022 (up to 44 mm) 0,021 (45–120 mm) 0,022 (> 120 mm)
Reaction to fire (DIN 13501-1)	C-s2, d0	C-s2, d0
Water vapour diffusion resistance μ	35	35
Dimensions [cm]	120 x 40	120 x 40
Thickness [mm]	20–40	50–200
Edges	smooth	smooth

3.2.2 Socket polystyrene boards 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
Reaction to fire (DIN 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 (coarse) / 311 (fine)

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

	weber.therm 310	weber.therm 311
Tear resistance when delivered [N/5 cm]	> 2.000	> 2.000
Tear resistance after alkaline stress [N/5 cm]	> 1.300	> 1.000
Weight [g/m²]	ca. 200	ca. 160
Mesh size [mm]	ca. 8 x 8	ca. 4 x 4
Coulour	wine red	wine red

Thick-layer mineral scratch renders can be only applied in combination with the mesh **weber.therm 310.**

3.4 Dowels weber.therm

The dowels **weber.therm** are used to ensure stability whenever the substrates have not a sufficient load-bearing capacity.

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 Universal 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 subsequent 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 top coat renders can be used:

weber.top 200/203/204/206 AquaBalance scratch renders
weber.star 220/221/223 AquaBalance floated renders
weber.star 240 AquaBalance rilled render
weber.star 261 AquaBalance freestyle effect render
weber.pas 431 AquaBalance
floated render based on dispersion of polymers
weber.pas 461 AquaBalance silicate render
weber.pas 471 AquaBalance
floated render based on siloxane resin
weber.pas 480/481 AquaBalance
floated renders on silicone resin

Characteristics of mineral top coat renders (weber.star/weber.top)	
Strength class / mortar group	CS I bzw. CS II/PIc
Compressive strength [N/mm²]:	> 1
Water absorbency coefficient w [kg/m² · √h]	< 0,5
Water vapour diffusion resistance μ	≤ 20
Binder	white hydrated lime, white cement
Characteristics of organic top coat renders (weber.pas)	
Water absorbency coefficient w [kg/m² · √h]	< 0,5
Water vapour diffusion resistance μ	60 bis 190
Bindemittel:	water-borne dispersion of polymers, water glass (only **weber.pas 460 AquaBalance/ weber.pas 461 AquaBalance**)

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

Etics weber.therm plus ultra

Facade / Wall

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 (6 x 10 mm)
- **weber.therm 313** coarse mesh for corner reinforcement with PVC profile (mesh size 8 x 8 mm)
- **weber.therm 314** thin mesh for corner reinforcement with PVC profile (mesh size 4 x 4 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
- **weber frame-seal beads** for window connections
- **Decorative profiles** for facade design
- **weber** corner and stop beads

4. Working instructions

4.1 Preliminary conditions

Respect following demands prior to 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 have been 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 carried out 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 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**.
- 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.

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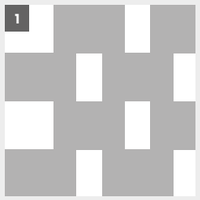

- Whenever the old organic paint or render is load-bearing, insulation boards can be glued after substrate cleaning. Whenever these substrates are not load-bearing, their surface must be opened in a checkerboard pattern and removed by at least 70% by steam-blasting or sand-blasting **(drawing 1).**
- Use the primer (silicate fixative) **weber.prim 406** on very absorbent substrates.

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 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.

b) Starting rail without profile: fix the ultra-solid mesh for corner reinforcement **weber.therm 312** on the wall with the bonding mortar **weber.therm**, on which the insulation boards will be later bonded **(picture 3).**

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Afterwards place another piece of **weber.therm 312** on the front of the panels, so that the first row of panels 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 sun and humidity. Do not install drenched or defective boards.

The bonding and reinforcing mortar **weber.therm plus ultra** 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.**

4

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 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.

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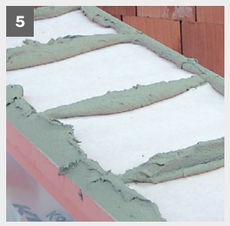

Apply the bonding mortar all around the insulation boards **weber.therm RS 021 plus ultra** in a frame shape and in 2 - 3 vertical strips on their backside **(picture 5).**

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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 **(pictures 6 + 7).**

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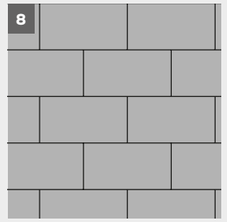

The bonding of boards always begins at one corner of the building at the lowest part of the facade. All further boards are laid butt-joint (i.e without joint in-between) in successive rows, starting from the low level determined by the starting rail and with a general offset of at least 25 cm **(picture 8).**

Also, at the building angles the boards are laid offset; in this case their edge must be protruding over the building corner by the board thickness and the thickness of the mortar bed **(picture 9).**

For reduction of cracks the insulation 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).**

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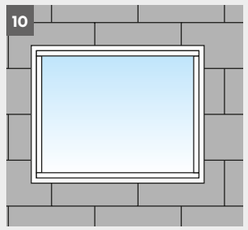

Whenever the installation of the window sill is not tight against rain, a second waterproofing layer must be planned with the stop-end for window sill **weber.therm Sol Pad** and the 2-comp. waterproofing coating **weber.tec Superflex D 2.** As a rule, a pre-compressed joint sealing tape must be installed in all angles and at all wall openings (doors and windows) between insulation boards and building parts **(picture 11).** 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. Fill the joints with the same insulation material.

Thinner joints (0.5 - 1.0 cm widen in V-shape) can be filled with the PU foam **weber.therm 345 (picture 12).**

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Etics with high-performance phenolic hard foam boards and thick-layer render buid-up

4.5 Anchoring

After a drying time of at least 3 days the works for the reinforcement layer and the dowelling can begin. The approved dowels **weber.therm** must be used.

Insulation board **weber.therm**	Plate diameter [mm]	Dowelling under mesh	Dowelling through mesh
RS 021 Facade plus ultra	60	X	

4.6 Design of corners and profiles

Install the ultra-solid mesh for corner reinforcement **weber.therm 312** with the system-compliant bonding and reinforcing mortar **(picture 13).** For prevention of cracks in the areas of window sills, window lintels and other wall openings, cut **weber.therm 312** to the required dimensions and glue it with the reinforcing mortar **(picture 14)** on the insulation boards

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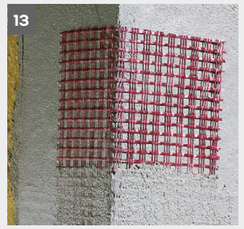

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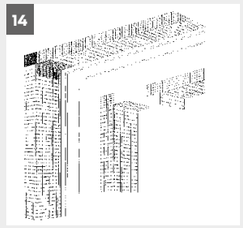

Alternative: the coarse mesh for corner reinforcement with PVC profile **weber.therm 313** must be fixed with the reinforcing mortar at the angles **(picture 15).** For prevention of cracks in angles the arrow-shaped glass fiber element for diagonal reinforcement of angles **weber.therm 315** or a piece of woven mesh cut to required dimensions (approx. 60 x 25 cm) are embedded in the reinforcement layer **(picture 16).**

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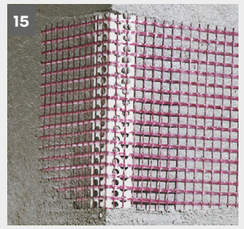

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Etics with high-performance phenolic hard foam boards and thick-layer render buid-up


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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. Render profiles are fixed with the profile and installation mortar **weber.mix 125** under consideration of the thickness of the chosen render system either directly on the ultra-solid mesh for corner reinforcement **weber.therm 312** or on the reinforcement layer **(picture 17).** Install a transition between window frame and render with an appropriate frame-seal bead with glass fiber mesh flag, such as **weber.therm Gewebeanputzleite (picture 18).**

4.7 Reinforcing works

Combinations woven mesh / reinforcing mortar	
	weber.therm plus ultra
weber.therm 310	+
weber.therm 311	+
Thickness of reinforcement layer	5-8 mm

Protect the glued boards from too heavy damp ingress. Mix the bonding and reinforcing mortar as described above. It is applied on the insulation boards and ruled level **(pictures 19 + 20).**


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Afterwards lay the woven mesh in vertical or horizontal wrinkle-free strips across the whole surface. The strips must overlap by at least 10 cm **(picture 21)**. Gently press the mesh with a flat trowel. The mesh must lie in the upper half of the reinforcing mortar layer.

Pay attention that the overlapping mesh strips do not coincide with other mesh reinforcements in the angles around windows and other wall openings. The mesh is brought flush to the corners of the building. In case of thick-layer overlay renders (for ex. scratch renders) roughen the reinforcing mortar, using for ex. a hard broom **(picture 22).** In case of thin-layer mineral or organic overlay renders rule level the reinforcing mortar to a flat, rough and in-plane surface with a wooden float (do not smooth it).


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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, and render strips

For window reveals, decorative offset frames and jambs, and render strips we recommend to use the lightweight mineral fine-grained top coat render **weber.star 261 AquaBalance** in 2 - 3 mm thickness on the reinforcing mortar. Without delay work to a floated or smooth finish. After sufficient drying, apply the silicate paint **weber.ton 410 AquaBalance.**

4.8 Overlay (top coat) renders

Respect a drying time of at least 7 days after application of the reinforcing mortar 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). Alternatively, 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 instructions in the technical data sheets for the application of overlay renders and paints.

In case of through-coloured, mineral and silicate thin-layer overlay renders, one coat of paint, for ex. **weber.ton 414 AquaBalance** is recommended to compensate colour differences.

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 in dots (at least 6 dots per panel). Use the drive-in dowels **weber.therm Schlagdübel** (4 pieces/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 ground, 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 reinforcement layer with the bonding and reinforcing mortar **weber.therm plus ultra** + woven mesh 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 pre-said first reinforcement layer apply a second one with **weber.therm 304,** if higher mechanical loads are expected. Alternative: mineral building panels can be installed on the perimeter insulation boards, prior to application of the reinforcement layer. Also, the bonding of ceramic clinker brick slips or tiles on the first reinforcement layer is another possibility.

Overlay (top coat) renders

Next day apply a layer of the bonding and reinforcing mortar **weber.therm** as overlay render, rule level and texture to a smooth finish. Alternative: after drying of the reinforcement layer apply the lime-cement render **weber.star 295** in approx. 5 mm thickness. After drying of the previous render layer, it is recommended to reinforce its hydrophobic behaviour in the upper socket part 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 render with exposed natural stones **weber.pas 434** can be used in the socket parts after treatment with the universal primer **weber.prim 403.**

Alternative: in case of low loads on the facade socket parts, an organic render can be also used **(weber.pas 431/471/480/481 AquaBalance).** In the 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.