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THERMAL INSULATION WITH THERMOCAP
THICK COATING SYSTEM



ARREGHINI®
ITALIAN PAINTS SINCE 1950



07

THERMOCAP

Thermocap is the composite system for external thermal insulation of walls and is a valid contribution to the containment of energy consumption as it reduces the transmittance of vertical opaque surfaces.



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FOREWORD

The last few decades have seen a significant increase in energy demand, which has led to a worrying change in the concentration of carbon dioxide in the atmosphere, resulting in a greenhouse effect and an exponential rise in temperature.

According to European Union estimates, the building sector plays a major role in energy demand, consuming 45% of the energy produced, and is responsible for 50% of air pollution. Recipient of 50% of the resources taken from nature, the sector produces 50% of Europe’s annual waste.

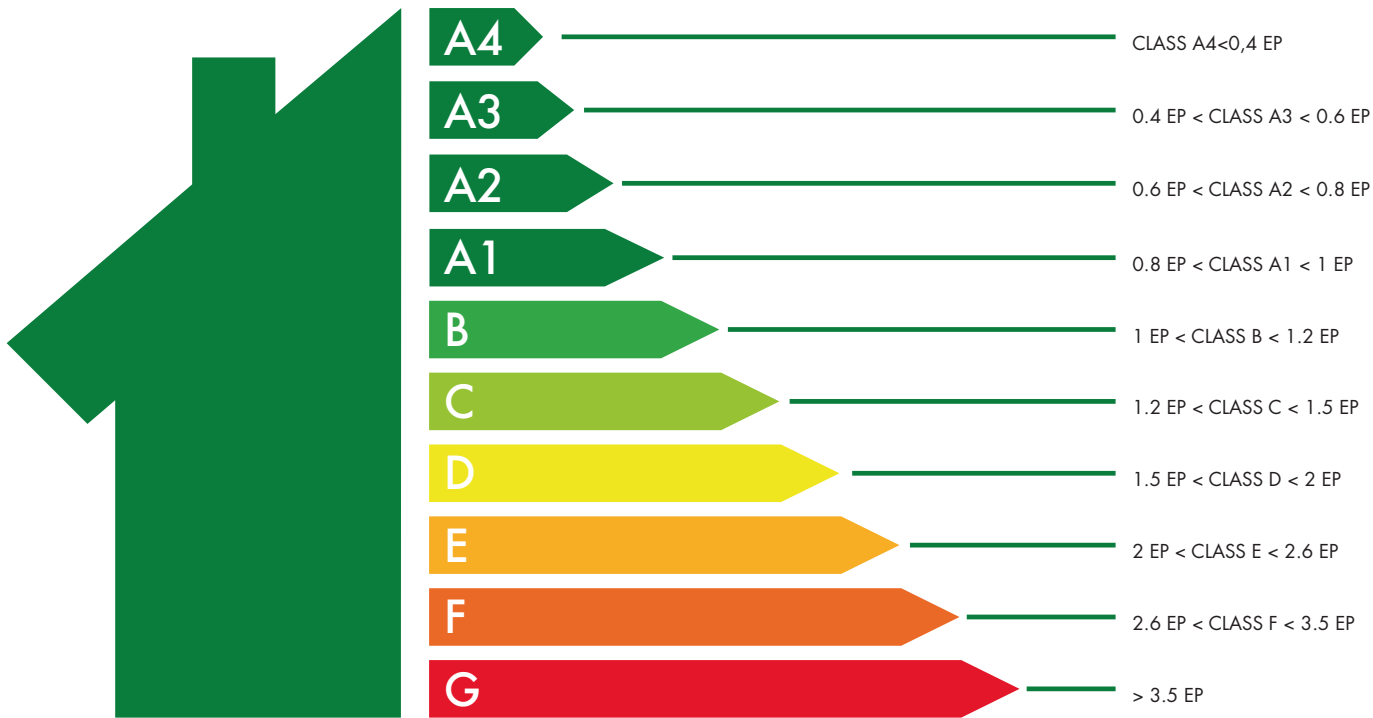
In the international context, there is a growing need for a profound change in the way buildings are constructed and their accompanying systems are designed. This urgency was expressed at the European level by the enactment of the Energy Performance of Building Directive (EPBD) 2002/91/EC. This directive, evaluating the scarcity of raw materials and energy sources, is directed towards containing consumption by promoting energy saving through an increase in energy efficiency and the development of renewable sources, so as to reduce the environmental impact and emissions into the atmosphere, as expressed in the Kyoto Protocol.

Many national laws and Presidential Decrees implementing the EC directive establish rules and methods for limiting dispersion in buildings, a more rational use of energy and the development of alternative renewable sources such as solar or wind energy. Ultimately, these are rules aimed at a new way of designing and planning energy-saving maintenance.

Legislative Decrees DL 192/05 and 311/06 and Regional Laws have made Energy Certification mandatory for buildings. Subsequently with the Ministerial Decree of 26 June 2015 there was an adjustment of the national guidelines for the Energy Certification of Buildings.

The aim of this instrument is to encourage all actors in the building process to develop low energy consumption and use renewable sources for electricity and heat production, by introducing the “energy efficiency” parameter as a value in the building market.

NEARLY ZERO ENERGY BUILDING



Energy certification of buildings, therefore, has different values for each actor in the process:

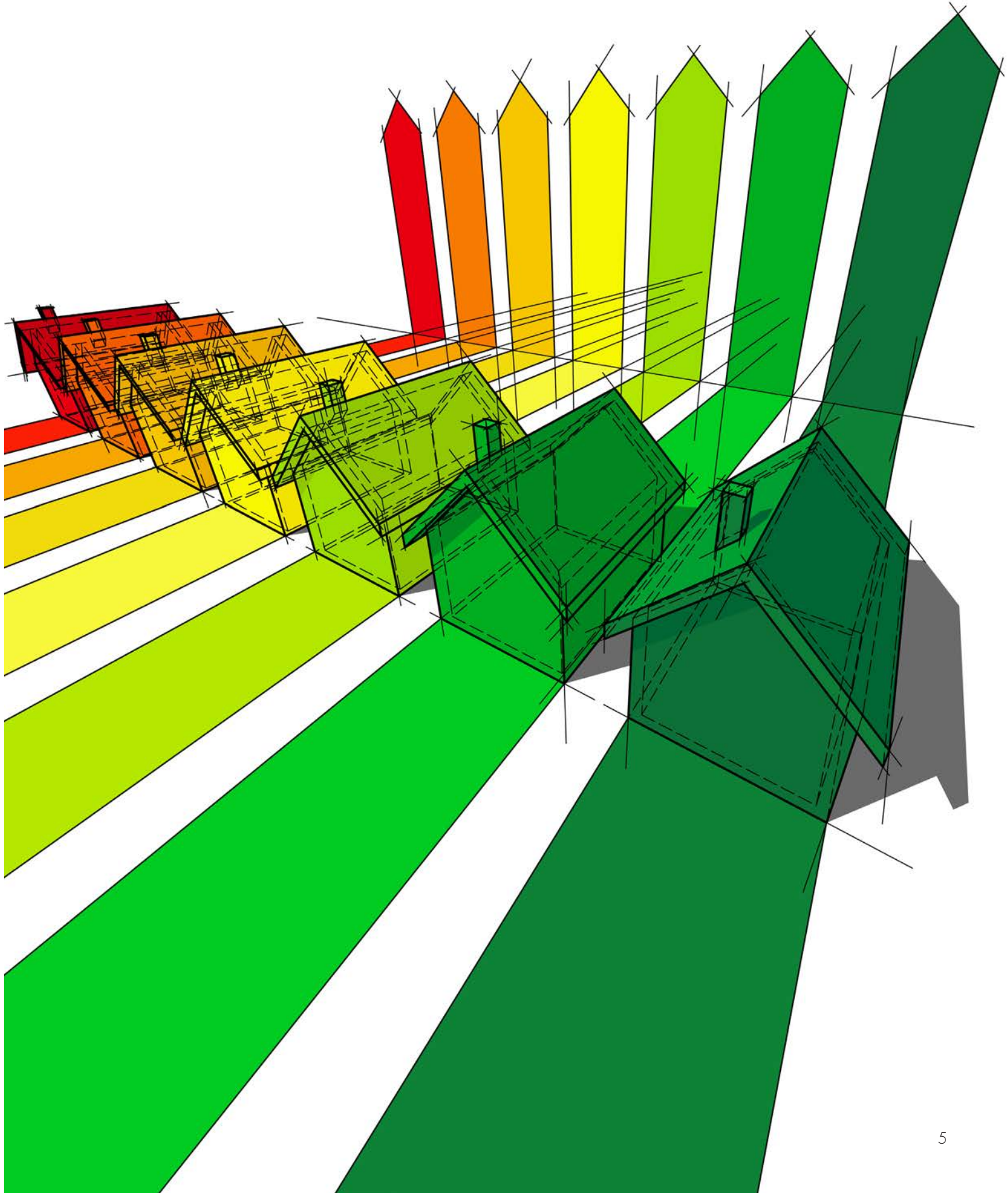
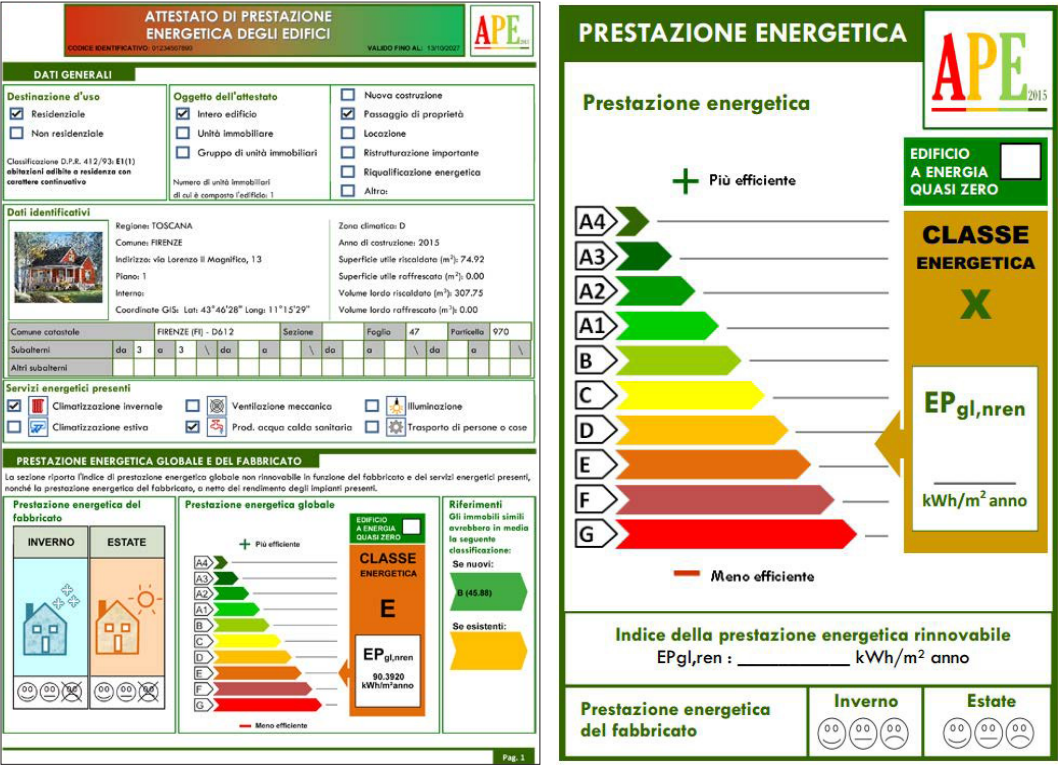
- for the builder it means bringing out the quality of the building;
- for the professional it becomes an indicator of the quality of the project;
- for users it is a comparative guarantee for an efficient and economic management choice;
- It is a real opportunity for the regional administrations to plan truly sustainable territorial development.

The energy class is marked by an alphabetical indicator where the letter G represents the class with the highest performance index (higher energy consumption) and the letter A represents the class with the best performance index (lower energy consumption). A numerical indicator next to the letter A identifies energy performance levels in ascending order, starting with 1 (representing the lowest energy performance level of class A).

The “nearly 0 energy building” (NZEB) box identifies a building with very high energy performance.

From 2019, all new public buildings will be obliged to be built to NZEB standards. From 2021, the obligation will be extended to all other buildings (public and private).

The APE (Attestato di Prestazione Energetica - Energy Performance Certificate), assigning specific performance classes and recommendations for energy refurbishment to buildings, is an instrument to steer the market towards buildings with higher energy quality. A correctly completed certificate allows end-users to assess and compare the performance of the building of interest and to compare it with technically achievable values in a correct relationship between investment costs and benefits. These services can be performed for new buildings as well as for renovations and energy upgrades.



THE THERMOCAP PACKAGE

In this particular context, the “coat” insulation system has been developed in the building sector. Thermocap is the composite system for external thermal insulation of walls and is a valid contribution to the containment of energy consumption as it acts to reduce the transmittance of vertical opaque surfaces.

Using Thermocap

Means lower consumption and less pollution, with considerable cost savings. In addition, there is an increase in living comfort, with a higher quality of life. It is estimated that houses without insulation have 70% energy loss and 30% energy use.

Thermocap

Eliminates heat loss by equalising temperatures throughout the internal volume, and also eliminates thermal bridges, i.e. the discontinuities of insulation that can occur at the junctions of structural elements such as floors and vertical walls. Discontinuous insulation causes different thermal expansion and different hygroscopic absorption, with the creation of cracks and water infiltration. This leads to degradation of the structure through chemical corrosion and biological aggression of mould and algae. With the Thermocap insulation system, the building is not subject to temperature jumps, inter-structural movements are significantly reduced and thermal bridges are eliminated.

Inside the house the results will be an increase in temperature, a reduction in condensation and mould formation, and a larger living area, as the structure will be leaner.

Thermocap insulation can be used on: plastered walls, solid walls, clinker walling, ceramic walling, brick walling, exposed concrete walls.

THE ADVANTAGES OF USING THE THERMOCAP SYSTEMS

Protection from the cold

Thermocap insulation protects the building from the cold and saves energy for heating. Thanks to its excellent wall insulation, it reduces heat loss to the outside of the house and eliminates thermal bridges once and for all. Room temperature is maintained in this way uniformly, resulting in a clear increase in living comfort and well-being.



Protection from heat

Thermocap insulation shields the building from heat by reducing the need to condition the air and lower the temperature with electrical appliances. It ensures considerable savings on cooling costs, guaranteeing great living comfort even in the summer season. By exploiting the thermal flywheel, it protects the façades from solar action, preventing the accumulation of heat by the structural mass.

Façade protection

With the use of Thermocap, the walls of buildings are protected from weathering, moisture and sunlight, while maintaining their aesthetics and avoiding damage caused by thermal bridges, such as cracks, seepage and mould. The healthiness of the external walls is preserved while optimising the liveability of the interior spaces.

Domestic well-being

At any time of year, Thermocap reduces the temperature range of the structure by lowering the temperature difference between the wall and the room, resulting in optimal heat perception. To guarantee a condition of domestic well-being it is therefore necessary to start from a correct design, choosing parameters that add value to home living.



Acoustic insulation

Some Thermocap systems also offer a high degree of acoustic comfort. The use of rockwool or cork insulation panels creates an effective barrier to filter out loud sounds and noise.

Respect for the environment

The Thermocap solution is in line with CAP Arreghini's values and philosophy, aimed at a concrete reduction in energy consumption and respect for the environment. Thermocap enables a reduction in space heating and cooling costs and, consequently, a reduction in harmful emissions into the atmosphere, as required by recent European regulations.

Thermocap Systems and Their Components

Thermocap is a bonded composite system with additional mechanical fixing consisting of adhesive, insulation, reinforcement mesh embedded in plaster, primer and finish. The product can be used for external thermal insulation of building facades on old and new plaster, concrete, brickwork and mixed masonry.

Thermocap ETA 09/0033 certified insulation system with EPS panels

<i>ADHESIVE</i>	501
<i>INSULATING AGENT</i>	REXPOL CAPPOTTO WHITE EPS 100, EUROCLASSE E, THERMAL CONDUCTIBILITY =0,035 W/mK
<i>GUSSET</i>	GUSSET SGR, GUSSET SGR-AP, GUSSET SGR-AV
<i>LEVELLING</i>	501
<i>MESH</i>	SILVER NET ETAG 004 ITC CNR (R131)
<i>BOTTOM LAYER</i>	PRIMER TOP
<i>FINISH</i>	MURIPLAST ACTIVE 1200, 1500 - SILOXCAP ACTIVE 1200, 1500

Thermocap S1 EPS panels insulation system

<i>ADHESIVE</i>	50, 501, 502
<i>INSULATING AGENT</i>	ECO 36 TR 100, EUROCLASS E, THERMAL CONDUCTIBILITY =0.036W/mK
<i>GUSSET</i>	GUSSET SGR, GUSSET SGR-AP, GUSSET SGR-AV, GUSSET PP8
<i>LEVELLING</i>	50, 501, 502
<i>MESH</i>	SILVER MESH ETAG 004 ITC CNR (R117)
<i>BOTTOM LAYER</i>	PRIMER TOP
<i>FINISH</i>	MURIPLAST ACTIVE- SILOXCAP ACTIVE- SILINTONACHINO ACTIVE- SILOXSIL ACTIVE 1000-1200-1500

Thermocap S2 Insulation system with EPS panels with graphite, higher thermal insulation especially at low densities

<i>ADHESIVE</i>	50, 501, 502
<i>INSULATING AGENT</i>	NEW REXPOL DARK EPS 80, EUROCLASSE E, THERMAL CONDUCTIBILITY = 0.030 W/mK
<i>GUSSET</i>	GUSSET SGR, GUSSET SGR-AP, GUSSET SGR-AV, GUSSET PP8
<i>SKIM PLASTER</i>	50, 501, 502
<i>MESH</i>	SILVER MESH ETAG 004 ITC CNR (R117)
<i>BOTTOM LAYER</i>	PRIMER TOP
<i>FINISH</i>	MURIPLAST ACTIVE - SILOXCAP ACTIVE - SILINTONACHINO ACTIVE - SILOXSIL ACTIVE 1000-1200-1500

Thermocap S3 Insulation system with EPS panels with graphite additive, high thermal performance

<i>ADHESIVE</i>	50, 501, 502
<i>INSULATING AGENT</i>	NEW REXPOL DARK EPS 100, EUROCLASSE E, THERMAL CONDUCTIBILITY = 0.031 W/mK
<i>GUSSET</i>	GUSSET SGR, GUSSET SGR-AP, GUSSET SGR-AV, GUSSET PP8
<i>SKIM PLASTER</i>	50, 501, 502
<i>MESH</i>	MESH SILVER NET ETAG 004 ITC CNR (R131), MESH PREMIUM NET ETAG 004 ITC CNR (R117)
<i>BOTTOM LAYER</i>	PRIMER TOP
<i>FINISH</i>	MURIPLAST ACTIVE - SILOXCAP ACTIVE - SILINTONACHINO ACTIVE - SILOXSIL ACTIVE 1000-1200-1500

Thermocap S4 Insulation system with EPS panels with graphite, with a semi-covering treatment on the outer surface that prevents deformation due to heat absorption; improves thermal insulation at low densities

<i>ADHESIVE</i>	50, 501, 502
<i>INSULATING AGENT</i>	REXPOL ADV EPS 100, EUROCLASS E, THERMAL CONDUCTIBILITY = 0.031 W/mK
<i>GUSSET</i>	GUSSET SGR, GUSSET SGR-AP, GUSSET SGR-AV, GUSSET PP8
<i>SKIM PLASTER</i>	50, 501, 502
<i>MESH</i>	MESH PREMIUM NET ETAG 004 ITC CNR (R117)
<i>BOTTOM LAYER</i>	PRIMER TOP
<i>FINISH</i>	MURIPLAST ACTIVE - SILOXCAP ACTIVE - SILINTONACHINO ACTIVE - SILOXSIL ACTIVE 1000-1200-1500

Thermocap S5 Stone wool-mineral, breathable, fire resistant, eco-friendly acoustic insulation

<i>ADHESIVE</i>	401
<i>INSULATING AGENT</i>	FRONTROK MAX PLUS EUROCLASS A1, THERMAL CONDUCTIVITY = 0.035W/mK
<i>GUSSET</i>	SGR GUSSET, SGR-AP GUSSET, SGR-AV GUSSET, PP8 GUSSET+ROSETTE DIAMETER 90-140
<i>SKIM PLASTER</i>	401
<i>MESH</i>	MESH PREMIUM NET ETAG 004 ITC CNR (R117), MESH SILVER NET ETAG 004 ITC CNR (R131)
<i>BOTTOM LAYER</i>	PRIMER TOP
<i>FINISH</i>	SILOXCAP ACTIVE 1200 -1500

APPLICATION MODES

Substrate analysis

- Before starting the implementation of Thermocap insulation systems, the substrate must be checked:
- the surface must be even, free of teeth, crowns and burrs, compact, free of loose parts and free of contaminants and grease;
 - in the presence of old plaster or finishes, check their adhesion; if there are portions that do not adhere well, remove them and restore flatness (see Tables 1 and 2);
 - reinforced and prestressed concrete surfaces must be free of release agents; if necessary, they must be removed by cleaning, which may be carried out by means of water washing, brushing or controlled sandblasting;
 - on reinforced concrete surfaces, assess whether carbonation and oxidation of the reinforcement rods are occurring;
 - the surface must be completely dry and there must be no permanent rising dampness from the ground;
 - in the event of efflorescence, remove it mechanically and then wash the surfaces with water;
 - if mould, algae or lichen are present, they should be removed using anti-mould products from the Sanacap range.

TABLE 1: Substrate flatness tolerances

REFERENCE	m	3	> 5
Walls with unfinished surfaces and ceiling soffits	mm	< 10	< 15

For the construction of thermal insulation systems, tolerances are allowed for the substrate (Table 1) and the finished surface (Table 2).

As there are no references in the European guidelines for ETICS (ETICS = External Thermal Insulation Composite System), these tolerances have been identified based on the standards and experience of member states.

TABLE 2: Flatness tolerances of the finished ETICS system

REFERENCE	cm	100	250	400
Walls with unfinished surfaces and ceiling soffits	mm	2	3	5

Insulation material requirements for thermal insulation systems

For insulating panels, the CE marking is necessary to place the products on the building market and is applied according to product standards: for EPS (sintered expanded polystyrene) UNI EN 13163, for mineral wool UNI EN 13162.

The European Guideline for Thermal Insulation Systems (ETAG 004) lays down certain minimum requirements that insulation panels must meet. For these values the manufacturer must provide a certificate from an external body.

In order for an insulation panel to be suitable for use in ETICS systems, in addition to the necessary certifications and adequate thermal conductivity value (λ), it must have technical characteristics (e.g. tensile strength, shear strength, water absorption, etc.) that are clearly defined and verified through an ETA test certificate.

Thermocap coating system

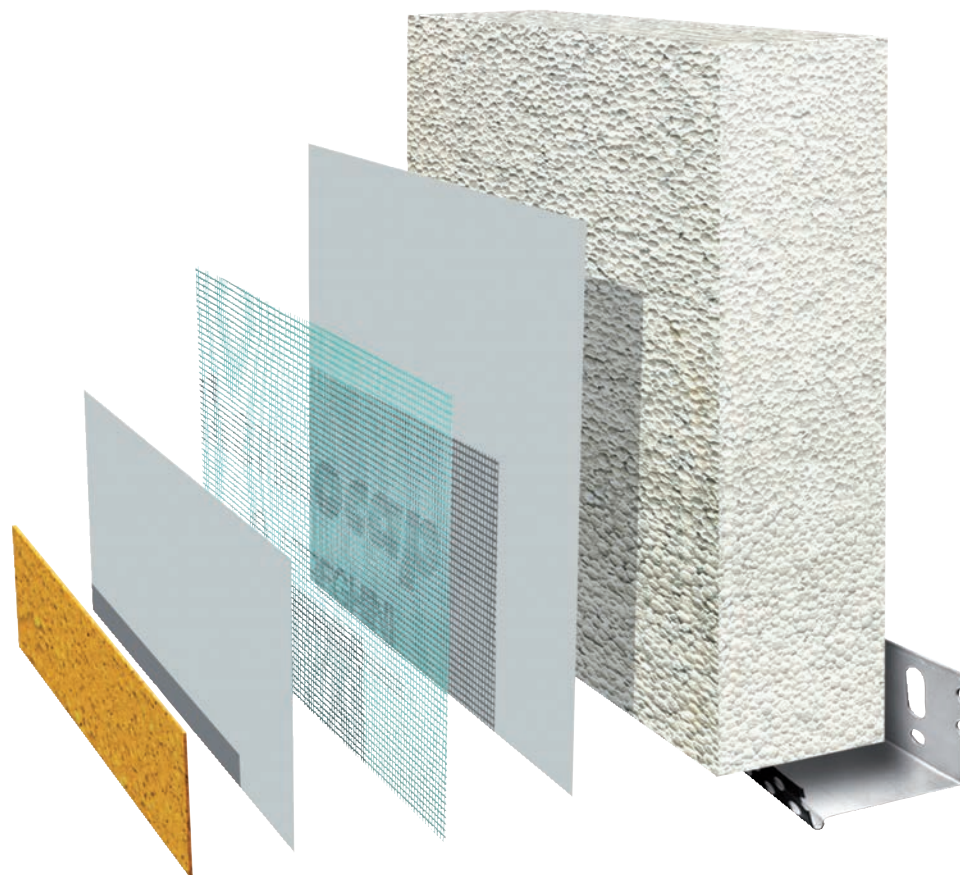
Requirements for sintered expanded polystyrene (EPS) panels

Product standard for CE marking: UNI EN 13163

Requirements according to ETAG 004:

For all categories of use (bonded and mechanically fixed systems):

- Water absorption by partial immersion $\leq 1 \text{ kg/m}^2$
- Thermal conductivity $\lambda \leq 0.065 \text{ W/mK}$
- For bonded systems (use categories 1 and 2):
- Shear resistance $f_{Tk} \geq 0.02 \text{ N/mm}^2$
- Shear modulus $G_m \geq 1.00 \text{ N/mm}^2$



Thermocap S5 insulation system

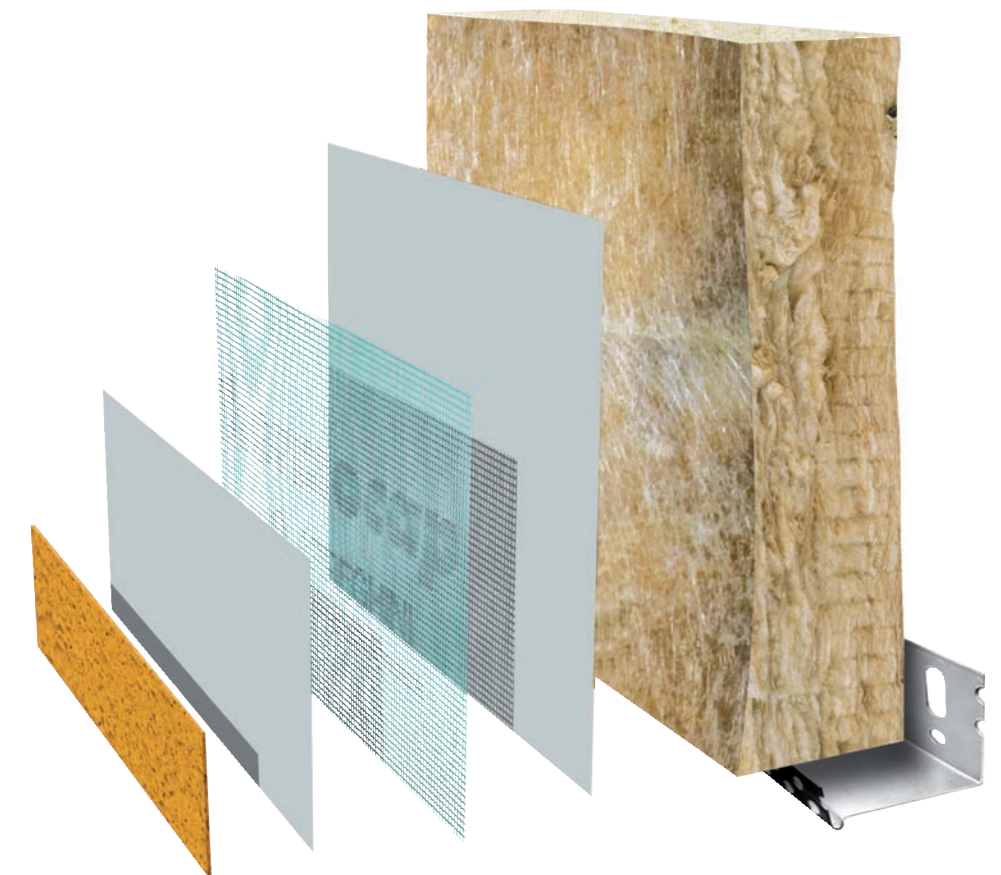
Requirements for stone wool boards (MW)

Product standard for CE marking: UNI EN 13162

Requirements according to ETAG 004:

For all categories of use (bonded and mechanically fixed systems):

- Water absorption by partial immersion $\leq 1 \text{ kg/m}^2$
- Thermal conductivity $\lambda \leq 0.065 \text{ W/Mk}$
- For bonded systems (use categories 1 and 2):
- Shear strength $f_{Tk} \geq 0.02 \text{ N/mm}^2$
- Shear module $G_m \geq 1.00 \text{ N/mm}^2$



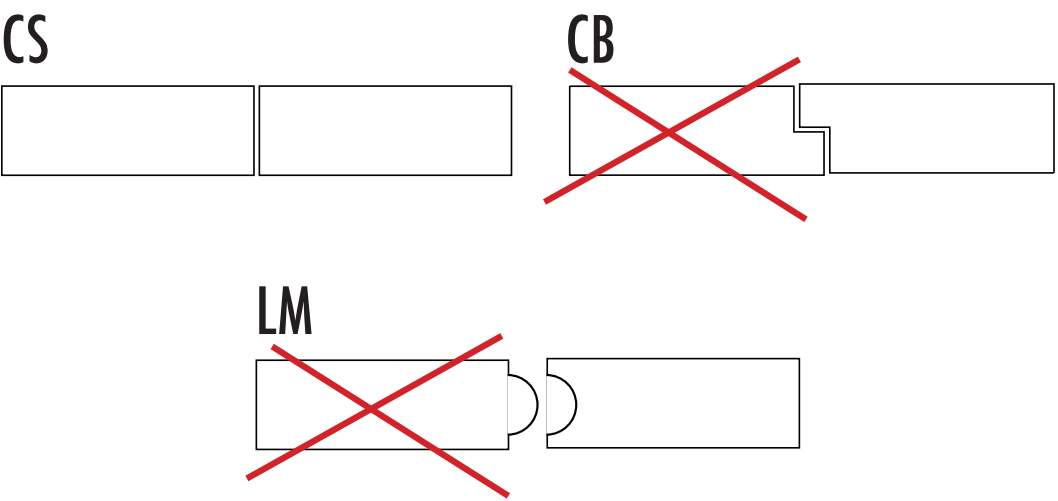
IMPLEMENTATION OF THE WORK

Plinth execution

Apply the base or starting profile, with drip edge, approximately 5-10 cm from the floor level. If you do not wish to use the starting profile or if you require continuous thermal protection that also includes areas underneath the walking surface, you can use XPS extruded polystyrene insulating sheets in compliance with UNI EN 13164 or expanded polystyrene with low water absorption in compliance with UNI EN 13163; these sheets may be flush or recessed in relation to the rest of the insulation system; in addition, sheets placed under the walking surface must be protected with special waterproofing sheaths, which are in turn protected with high-density polyethylene embossed sheaths, all covered with perimeter draining gravel. This type of plinth is obligatory when using the system with stone wool insulation panels (such as our Thermocap S5 system).

Preparing the adhesive

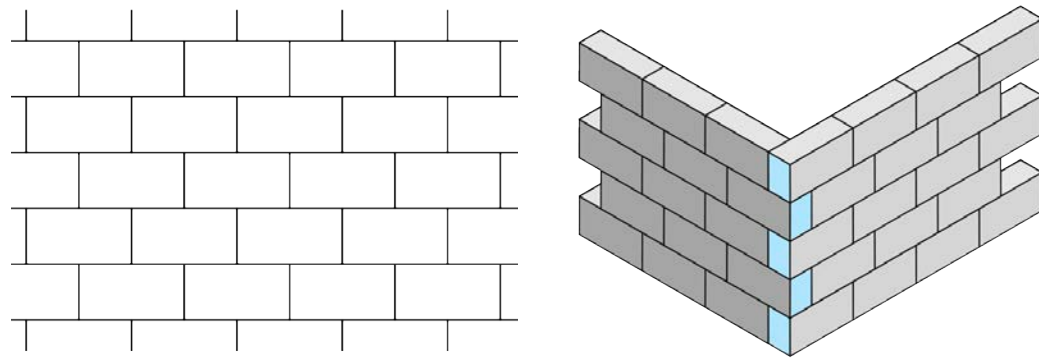
The perimeter shaping of the insulation boards must be sharp-edged and of a size suitable for the surfaces to which they are to be glued, and then the panels must be glued.



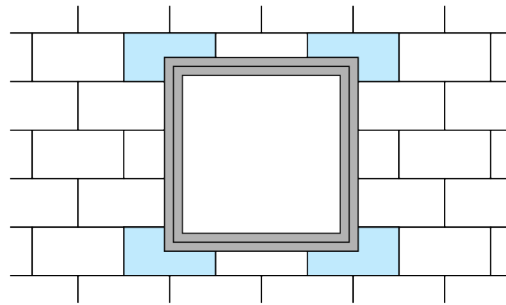
Prepare the Rasacap adhesive skim coat, carefully following the instructions in the specific technical data sheet. The adhesive skim coat can be applied manually or by machine. The adhesive may be applied using the method of bonding to the perimeter and central points in the case of irregular surfaces or non-plastered bricks, or over the entire surface of the panel in the case of plaster or planar concrete walls. In the case of mineral wool panels, due to their nature, it is not possible to apply the adhesive directly. A thin layer of adhesive must first be applied evenly to the panel to fix the surface fibres, and then the edge and 2-3 central points must be made. In spot application it is important for the adhesive to cover a minimum area of 50% of the total area of the sheet.

Positioning the insulation sheets

Apply the sheets from bottom to top, placing the longer side horizontally with staggered vertical joints, perfectly aligned. The offset of vertical joints must be at least 25 cm. Use only undamaged sheets for laying, do not use damaged ones (e.g. with broken or chipped edges or corners). At the corners of the buildings, only whole or halved sheets staggered between each other may be used. Avoid matching the joints of the insulation sheets to the edges of doors and windows to prevent cracks from forming.



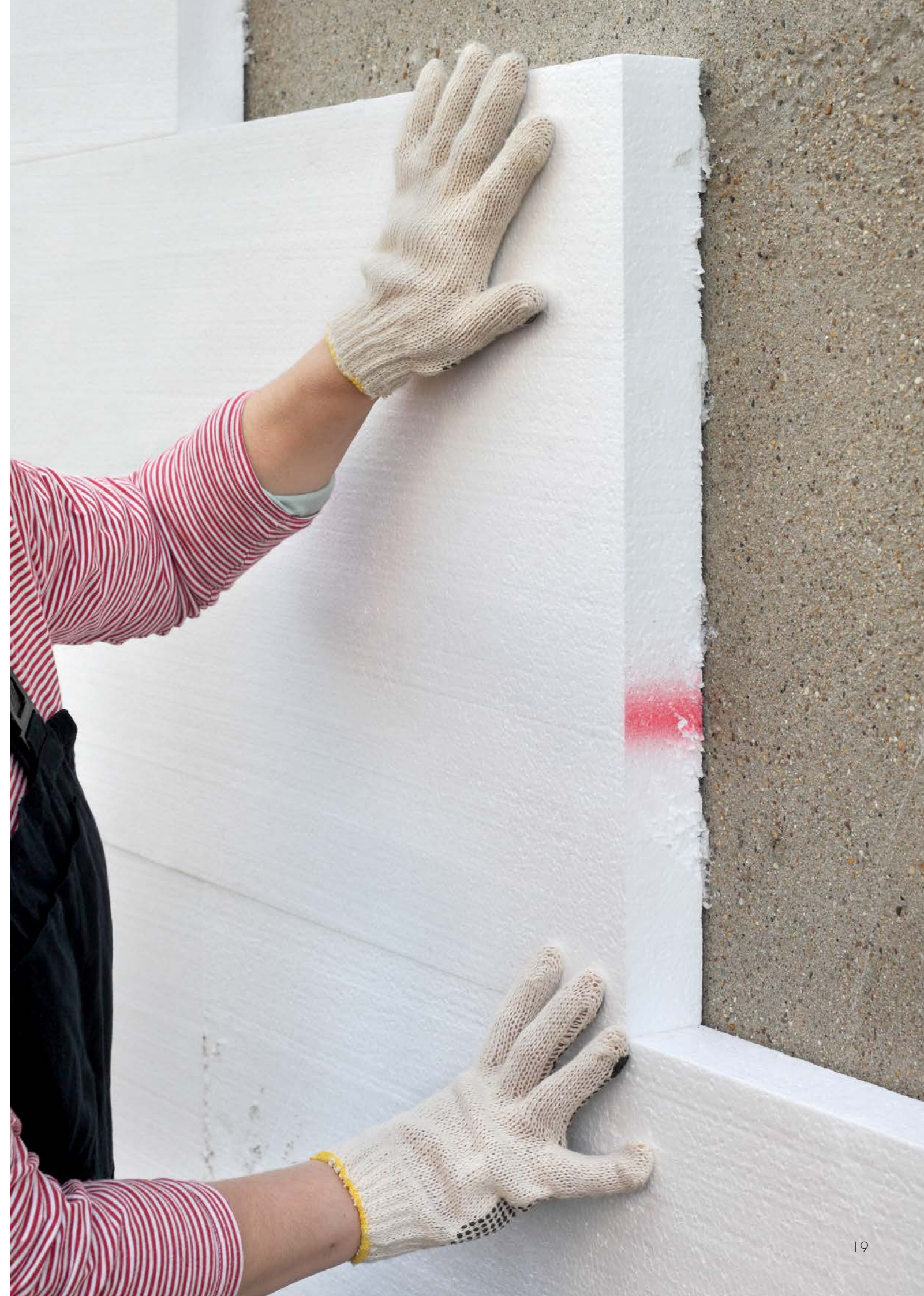
Carefully compress the sheets so that the adhesive makes full contact with the substrate. Check the flatness of the insulation system with a straight edge to ensure a constant thickness of the subsequent smoothing.



If there are steps between panels once they have been positioned, they can be tapped in order to level the surface and respect the flatness; if the steps appear after the adhesive has dried, the EPS panels can be sanded with coarse grain sandpaper; in the case of mineral wool panels, since it is not possible to sand them, the irregularity must be compensated for with a first smoothing.

In any case, the following should be checked:

- no air must be able to pass between the insulation sheet and the substrate (otherwise a chimney effect will occur)
- the sheet must be uniformly fixed to the surface of the substrate (otherwise a cushion or mattress effect will occur).



Compensating elements > 15 cm wide made of the same insulating material, cut in a perpendicular fashion, are permitted, but must not be used on edges or near openings; in any case, any visible gaps between the sheets must be filled with strips of the same type of insulating material, but must only be applied on flat surfaces and not on the edges of the building; if the width of the joint does not allow it, for joints up to 5 mm, a specific polyurethane foam may be used; in both cases, the filling must be carried out over the entire thickness of the sheet; in any case, they must never be filled with an adhesive skim coat to avoid thermal bridges. The joints of the boards must not coincide with joints between different materials in the structure and in masonry joints (e.g. patching); this also applies to inactive cracks where an overlap of at least 10 cm between the insulating sheets must be observed.

If there are any protruding parts, such as shutter boxes, they must be covered without joints between insulating panels; the excess insulation material must be cut off at the back of the panel, leaving a minimum thickness of at least 3 cm (in any case more than 1/3 of the panel thickness). Any expansion joints in the structure must also be used in the insulation, using a specific element (PVC expansion joint with mesh, PVC corner expansion joint with mesh).

In the connection areas with windows, doors, window sills and roofs, to guarantee an air and watertight seal, we recommend the use of self-adhesive compressible sealing tape, which should be positioned in a straight line, cut out near the corners of the profile to be protected, and not applied in a single continuous piece, as curves are not permitted; the same between the window and the insulation and at window sills, marble pieces, etc.

It is possible to use a window profile with plus mesh and under sill profile, a PVC profile with adhesive tape and heat-sealed mesh, as a plaster-tight connection on the ledge. In the case of irregularities in the sheets, after the adhesive has dried, the EPS panels can be sanded with coarse-grained abrasive paper, taking care to remove any dust that may have formed; in the case of rock wool panels, since it is not possible to sand them, a first coat of adhesive skimming compound can be applied to compensate.

Notes: If, due to delays in construction, façades with surfaces already insulated with EPS panels are exposed to UV radiation for a long time, the panels may yellow. They should be protected and their surface sanded before applying the primer plaster; mineral wool panels are sensitive to water and moisture, should always be protected and cannot be sanded.

Fixing insulation boards

The substrate must be made or prepared in such a way as to guarantee lasting adhesion between the insulating panel and the wall by means of gluing or gluing and additional mechanical fixing using gussets. To limit wind loads on the façade, gussets are usually applied 48 hours after gluing the panels to allow the adhesive to harden sufficiently and prevent the panels from moving. This ensures that the panels are fixed to the substrate, in addition to (not instead of) gluing.

However, using gussets is always mandatory in the following cases:

- work on old buildings;
- plastered surfaces;
- insulation panels with a thickness > 10 cm;
- rock wool insulation panels;
- perimeter and skirting panels;
- buildings with a height > 5 m;
- ETICS systems with surface mass > 30 kg/sqm (adhesive + insulation + finish).

Choice of gussets

Gussets must comply with and meet the requirements of ETAG 014 and refer to the categories of use indicated in the standard.

The categories of use according to ETAG 014 define the fields of application of the gusset in relation to the various types of substrate:

A	Concrete
B	Solid bricks
C	Hollow or perforated bricks
D	Lightweight concrete
E	Cellular concrete

The gussets should be determined by the designer according to the type of area, the system loads, the height of the building, the strength of the wind and the size and type of the panel and the substrate. In the case of walls made of concrete cast in disposable formwork, the anchorage of the gussets must take place in the concrete core. The choice of the type of gusset must be made by ensuring that it is suitable for the substrate, taking into account the plaster, any levelling mortar and the flatness of the anchoring substrate, so that the fixing has adequate resistance to tearing. The diameter of the gusset plate depends on the insulation used and can be of different sizes (e.g. EPS 60 mm, MW mineral wool with horizontal fibres 90 mm).

Drilling holes for gussets

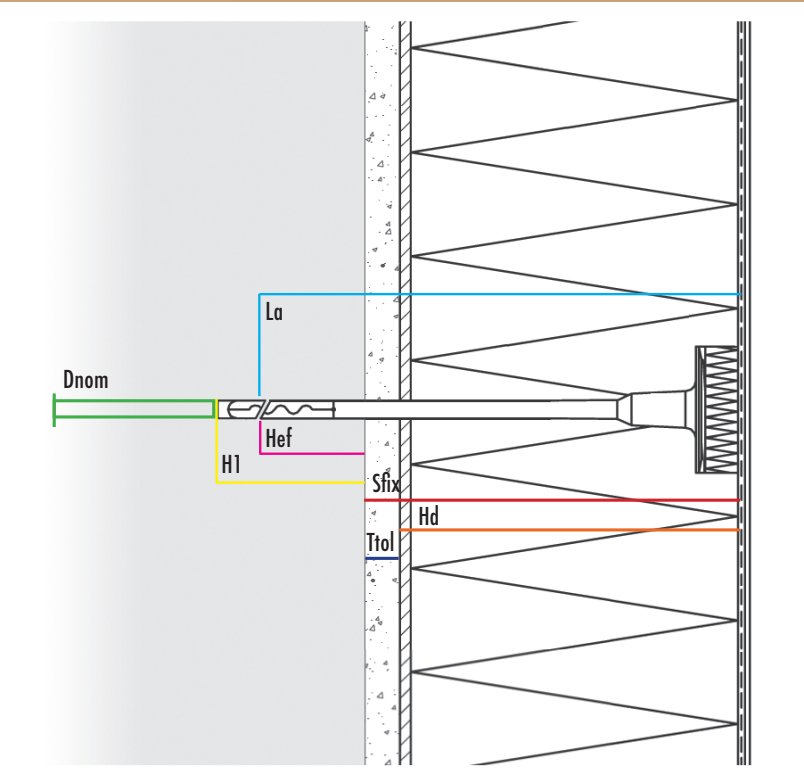
- The holes for the gussets can only be drilled when the adhesive has hardened (usually after 2-3 days);
- Use drill bits with the diameter indicated on the gusset;
- Use drills and percussion drills only with concrete or solid bricks;
- For perforated or solid brick and hollow core concrete blocks, use the drill bits and drill provided by the system manufacturer;
- Pre-drill the MW stone wool panels with the drill switched off;
- Adjust the drill stop depth = gusset length 10 / 15 mm;
- Observe the minimum distance between gussets and building edges or joints (normally 10 cm).

Gusset patterns

For a correct installation of the gusset, drill the hole perpendicularly to the substrate with a drill bit with a diameter equal to the diameter of the gusset shank (8 cm). The hole must be cleaned of drilling dust before the gusset is applied.

The length of the gusset will be determined by:

- anchorage depth;
- any thickness of the old plaster;
- thickness of the glue;
- thickness of the insulation sheet.



LEGEND

H1: Depth of the hole (e.g: 6 cm)

Hef: anchorage depth (e.g.: 5 cm)

Dnom: gusset diameter 8 mm

Sfix: fixable thickness (hd+ttol)

Hd: thickness of the insulation panel

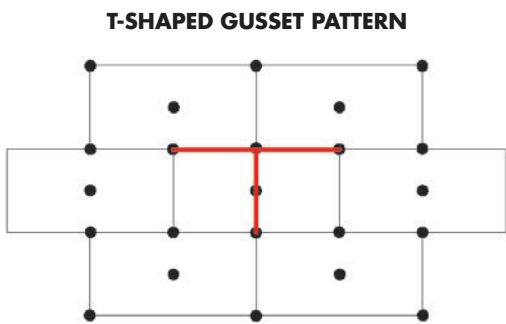
Ttol: thickness of adhesive plus old plaster, if any

La: length of the gusset

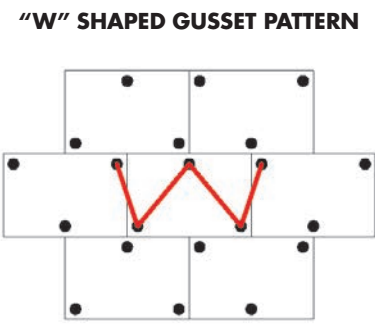
Gusset length $la = sfix + hef = hd + ttol + hef$

Gusset insertion

The gussets can be mounted using either percussion or screwing methods, depending on the type of gusset; in the case of screwing gussets, they can be applied flush with the insulating panel or recessed (creating a seat in the slab for the insertion of the gusset using a specific cutter, closing the hole afterwards with the appropriate plugs made of insulating material); for percussion gussets, the installation is flush with the panel. The gussets should be mounted where the adhesive has been applied; in this way the crushing force generated by the gusset effectively increases the cohesive force of the adhesive; in any case, the correct fixing of the gusset should be checked and if the gussets are bent or loose (with poor grip) they should be removed and a new gusset inserted into a new hole; the visible holes should be filled with insulation/foam. The gussets can be positioned according to the following gusset schemes, depending on the type of insulation material used.



Recommended for polystyrene (EPS) and cork boards.
A gusset is placed in each slab intersection, plus a gusset in the centre of each slab.



Recommended for stone wool (MW) boards. Each insulation board is fastened with three gussets fixed according to a W diagram. The distance to the edge of the board should be approximately 5 cm.

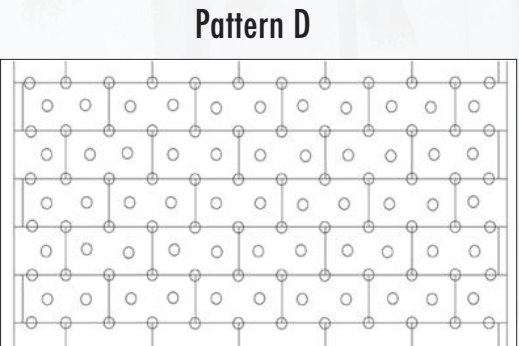
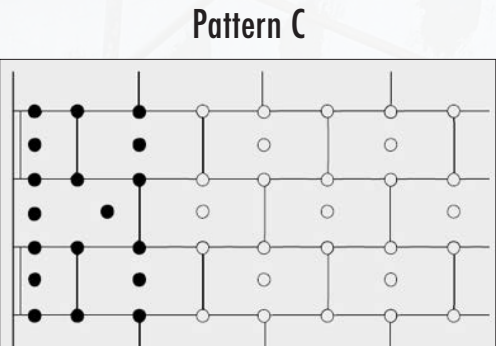
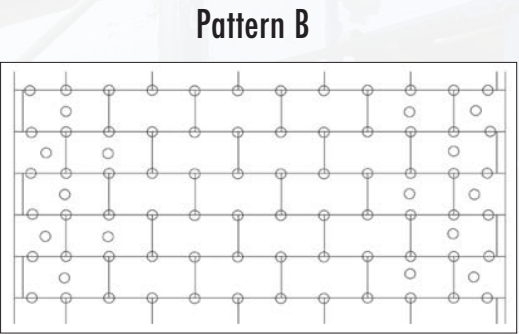
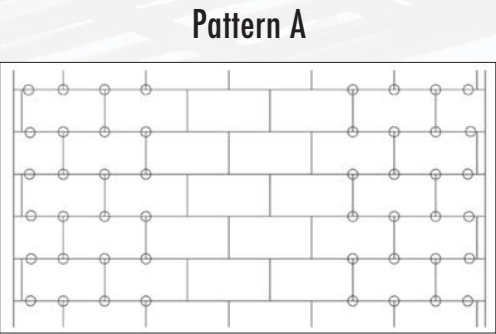
The choice of the number of gussets is dictated by the type of insulation material, the height of the building, the orientation and the position on the wall.

Since the action of the wind and the tensions of the structure are more intense in the perimeter areas of the façades than in the centre, it is advisable to increase the number of gussets per m² in these areas; the perimeter gusset pattern should be carried out for a width of at least 1 m.

In the vicinity of edges, gusset should be applied at a distance >10 cm from the edge. In the case of buildings with heights >50 m or located in very windy areas, the gusset pattern should be calculated by the designer regardless of the insulation material used.

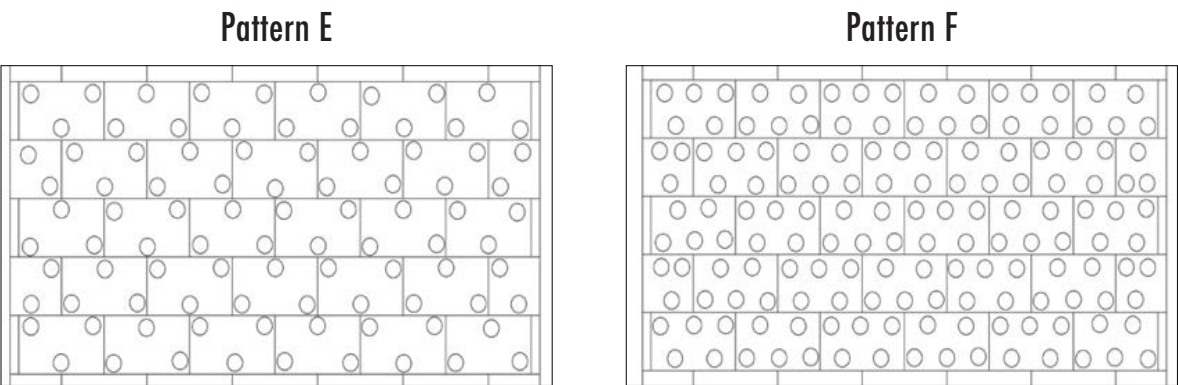
No. of recommended gussets on EPS and cork

Structure height	Edge	Central area	Pattern reference
< 5 mt	4 nails per m ²		Pattern A
< 8 mt	6 nails per m ²	4 nails per m ²	Pattern B
< 20 mt	8 nails per m ²	6 nails per m ²	Pattern C
< 20 mt	8 nails per m ²	8 nails per m ²	Pattern D



Recommended number of gussets on stone wool (stone wool insulation boards should always be gusseted)

Structure height	Edge	Central area	Pattern reference
< 8 mt	3 nails/brush	3 nails/brush	Pattern E
< 8 mt	5 nails/brush	5 nails/brush	Pattern F



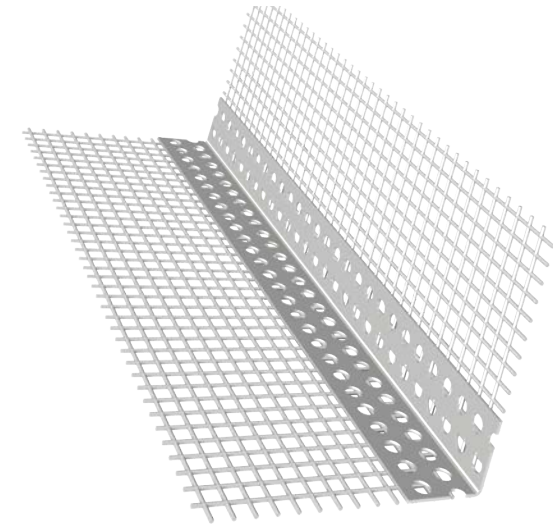
CORNER PROTECTION

Edge protectors

For the protection of external corners and edges of the building, both protruding and recessed, proceed with the application of PVC corners with mesh, corners with fibreglass mesh, by first spreading a layer of adhesive skim coat on the insulating panels of the same width as the mesh and positioning the corners by drowning the pre-treated mesh.

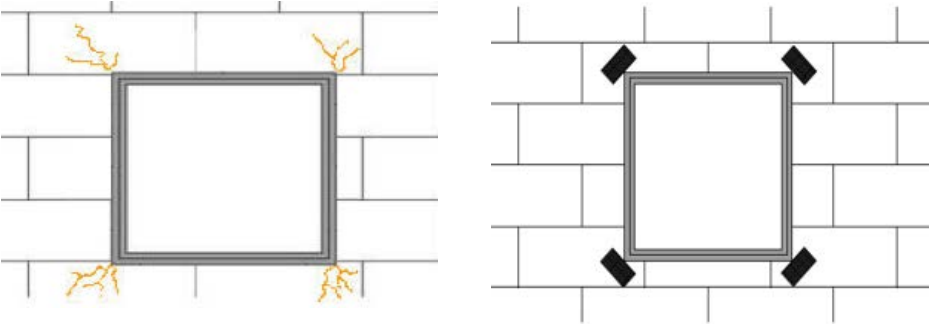
In cases where it is necessary to provide a drip edge, balcony overhangs or horizontal recesses, place and fix in the same way as mentioned, exposed mega net drip edge or drip edge with mesh, PVC angle brackets with glass fibre mesh.

Observe a drying time of 12-24 hours depending on weather conditions before proceeding with other operations to avoid damaging the bonding.



Corner reinforcement on doors and windows

At the corners of all openings (doors and windows) and soffits, it is necessary to insert Arrow Net Reinforcement Mesh and/or Intrados Angular Mesh, pre-shaped reinforcement meshes to be applied at an angle of about 45° in the same way as the corner protectors, as reinforcement to disperse tension and thus prevent cracks, guaranteeing the continuity of the reinforcement of the thermal insulation system.



REINFORCED SKIMMING

Preparing the plaster and laying the reinforcement

The insulation panels should be covered as quickly as possible with a reinforced skim coat to protect them from UV radiation and rain.

Prepare a skim coat from the Rasacap Line according to the instructions on the technical data sheet and mix with a low-speed whisk or mixer until obtaining a homogeneous, lump-free mixture. Using a metal trowel, spread a continuous, homogeneous layer on the surface with a consumption of approximately 2.5-3 Kg/m² and on this fresh skim coat place the Silver Net reinforcement mesh ETAG 004 ITC CNR or R131 starting from the top downwards, taking care to overlap the ends of the mesh by approximately 10 cm to ensure continuity of the reinforcement; then apply very light pressure by pressing the mesh on the fresh plaster, drowning it, eliminating air pockets and avoiding folds and swelling. The mesh should be positioned at mid-thickness or in the outer third of the skim coat; in the case of a new skim coat, apply new material "fresh on fresh" with a trowel so that the mesh is completely embedded in the skim coat. After 24 hours, once the first layer of adhesive has dried, apply a further layer of skim coat (total consumption of skim coat equal to 7-9 kg/m²) so that the mesh is no longer visible. The minimum total thickness of the skim coat and the positioning of the mesh are shown in the table below.

Nominal thickness (mm)	Minimum thickness (mm)	Mesh positioning*:	Measures to be observed for systems with panels of:
3	2	in the middle	EPS
5	4	in the outer third	EPS and stone wool
8	5	in the outer third	Stone wool

**Mesh coverage minimum 1 mm and at least 0.5 mm in the overlap area.*

Finishing coat

Once the skim coat is cured, which in optimal conditions takes about 15 days, apply the primer and finish. Applying the top coat too early can lead to staining and crystallisation of salts on the surface.

Then apply Primer Top, a water-based pigmented wall primer, to the surfaces to be treated, and after 6-8 hours apply the chosen thick coating from the Thermocap Line, distributing the mass evenly over the surface with a steel trowel and then levelling it off with a plastic trowel.

Depending on the system used, different types of thick coatings can be used; it is advisable to apply the coating with a thickness of ≥ 1.5 mm.

To avoid severe overheating of the ETICS system, colours should be chosen with a reflectance value (LRV) greater than 25. The higher value of the reflection index is recommended for thicker insulation, surfaces exposed to strong sunlight or in climatic zones such as high mountains, sea front, etc.

Thermo-hygrometric limit conditions for application: apply at temperatures between +5 °C and +30 °C; use material from the same batch or, if necessary, complete the work at the corner of the wall; avoid application under direct sunlight, on overheated surfaces even if in the shade, in the presence of rain or with air humidity higher than 70%. Provide suitable temporary protection against rainwater infiltration of the upper edge of the "coat" still under construction.

Design and execution details

For a good functional, practical, aesthetic and lasting result of the insulation system, it is necessary to ensure that all connections and closures are properly executed.

The accessories profiles, gaskets, seals, and mounting diagrams must guarantee for the ETICS system:

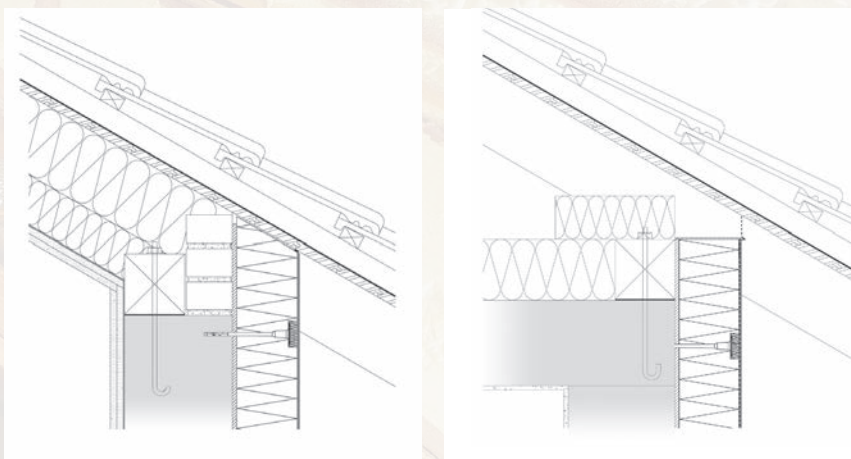
- the watertightness of the joint;*
- compensation for differential movements;*
- sufficient damping of vibrations transmitted between the building elements and the coat;*
- mechanical resistance.*

For the execution of system-compliant closures and fittings on different parts of the building, the members of the EAE (European Association for Composite External Thermal Insulation Systems) offer defined, tested and guaranteed solutions with the necessary accessories. The described information and detailed diagrams are available in pdf, dxf, dwg and jpg formats at www.ea-etics.com.

Roof connections

In the case of direct connections to the roof (hot roof), the insulation panels must be mounted in such a way that as few cavities as possible are formed and the self-expanding prestressed insulation tape must be inserted.

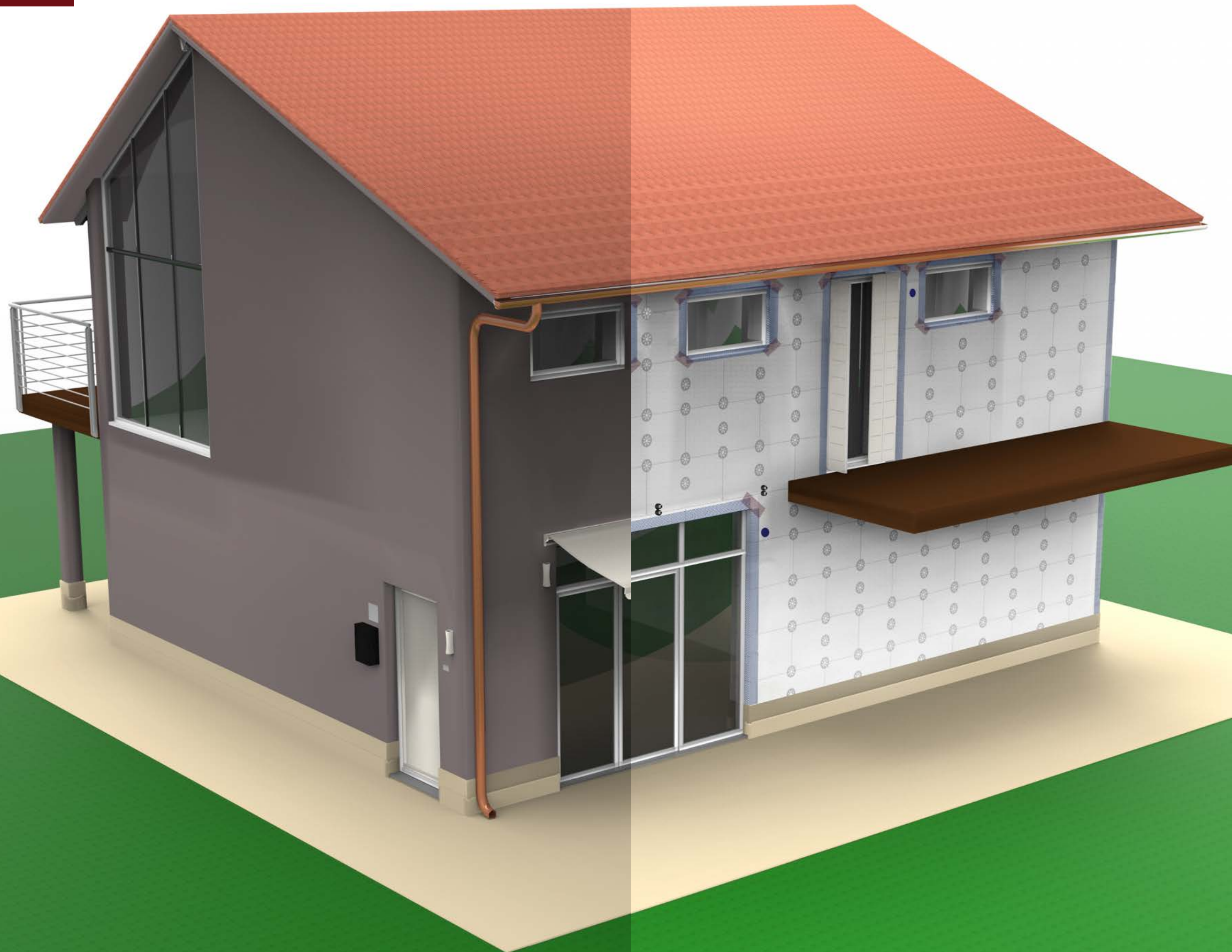
The actual practical applicability of the details described in this section must be verified on site, as it is not possible to represent all the specific features of the building. Some of the details provided by the system manufacturer may differ from this representation.



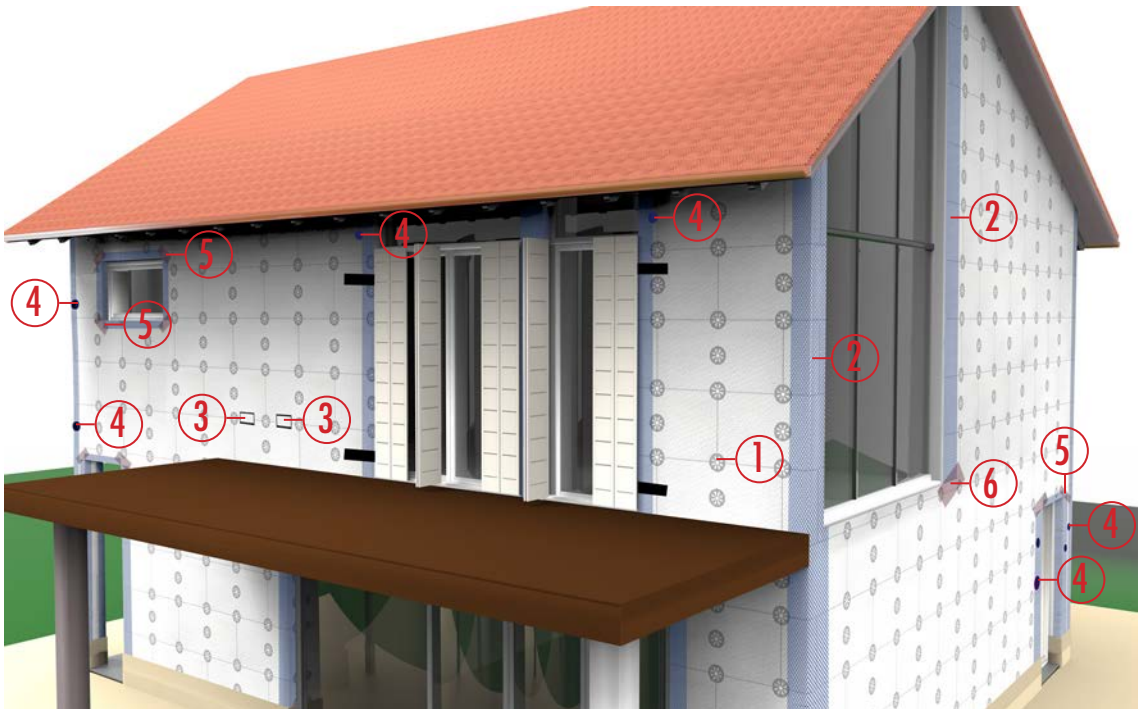
6 REASONS FOR CHOOSING THE THERMOCAP SYSTEMS


- 1. The Thermocap system has the right balance of vapour permeability and water impermeability.*
- 2. The insulation chosen for Thermocap systems has the lowest conductivity on the market.*
- 3. Rasacap skim coatings have an adhesion strength - between EPS insulation and masonry - significantly higher than the minimum value required for CE marking.
This resistance is maintained in all conditions, whether dry or wet.*
- 4. The reinforcement mesh used in the Thermocap system is so tear resistant that it clearly exceeds the criteria for CE marking, even after ageing.*
- 5. The Rasacap Line adhesive skim coat used as a plaster for embedding the mesh guarantees high adhesive power, high water resistance and excellent mechanical stability.*
- 6. Thermocap systems remain unaltered even when subjected to temperature changes between -20 °C and +50 °C, rain and temperatures up to 70 °C. Therefore, Thermocap is not subject to swelling, joint cracks, detachment, cracks or the presence of water after immersion.*

COMPONENTS



VIEW 1. COMPONENTS




1
= SGR GUSSET


8 mm percussion gusset, with nail pre-mounted in the gusset shaft.

2
= PVC CORNER WITH MESH



PVC corner protector with glass fibre mesh.

3
= DK FIX SQUARE


Square support made of high density EPS with dimensions 98x98 mm.

4
= DK FIX CYLINDER EPS


Cylindrical support made of high-density EPS, with diameter 90 and thicknesses 60, 80, 100, 120 and 140 mm.

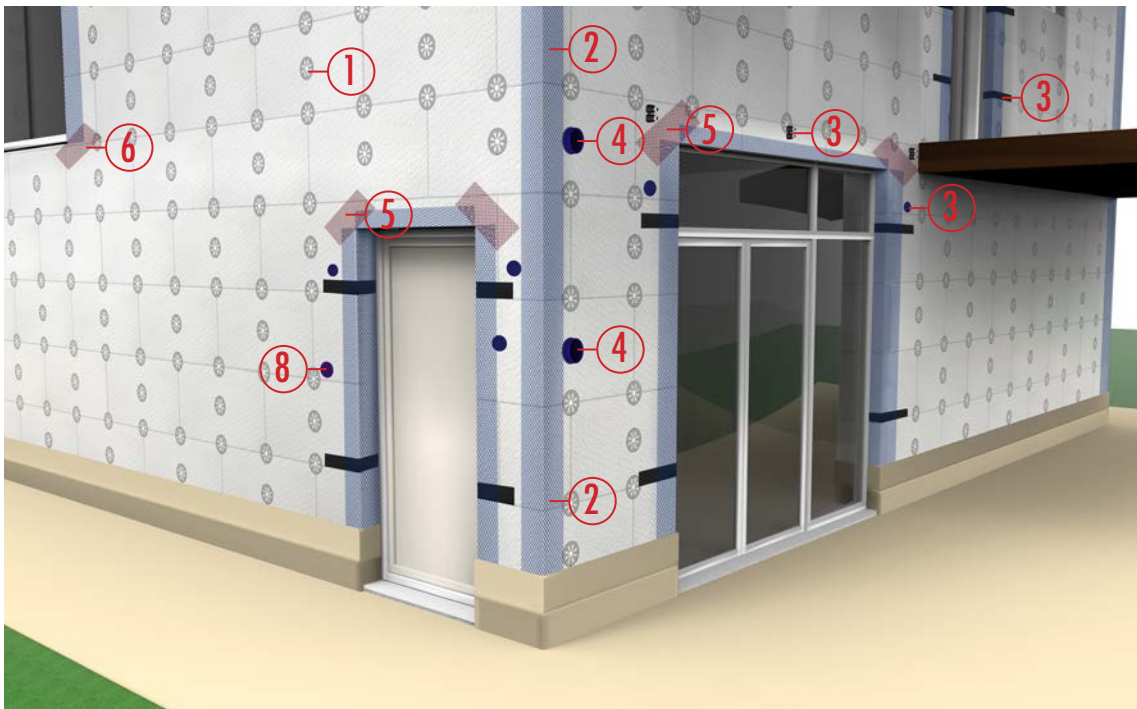
5
= CORNER MESH FOR SOFFITS



Preformed corner for soffits used as reinforcement for window soffits.

6
= ARROW NET REINFORCEMENT MESH


White preformed mesh.

VIEW 2. COMPONENTS




1
= SGR GUSSET



8 mm percussion gusset, with nail pre-mounted in the gusset shaft.

2
= PVC CORNER WITH MESH



PVC corner protector with glass fibre mesh.

3
= DK FIX SQUARE


Square support made of high density EPS with dimensions 98x98 mm.

4
= DK FIX CYLINDER EPS


Cylindrical support made of high-density EPS, with diameter 90 and thicknesses 60, 80, 100, 120 and 140 mm.

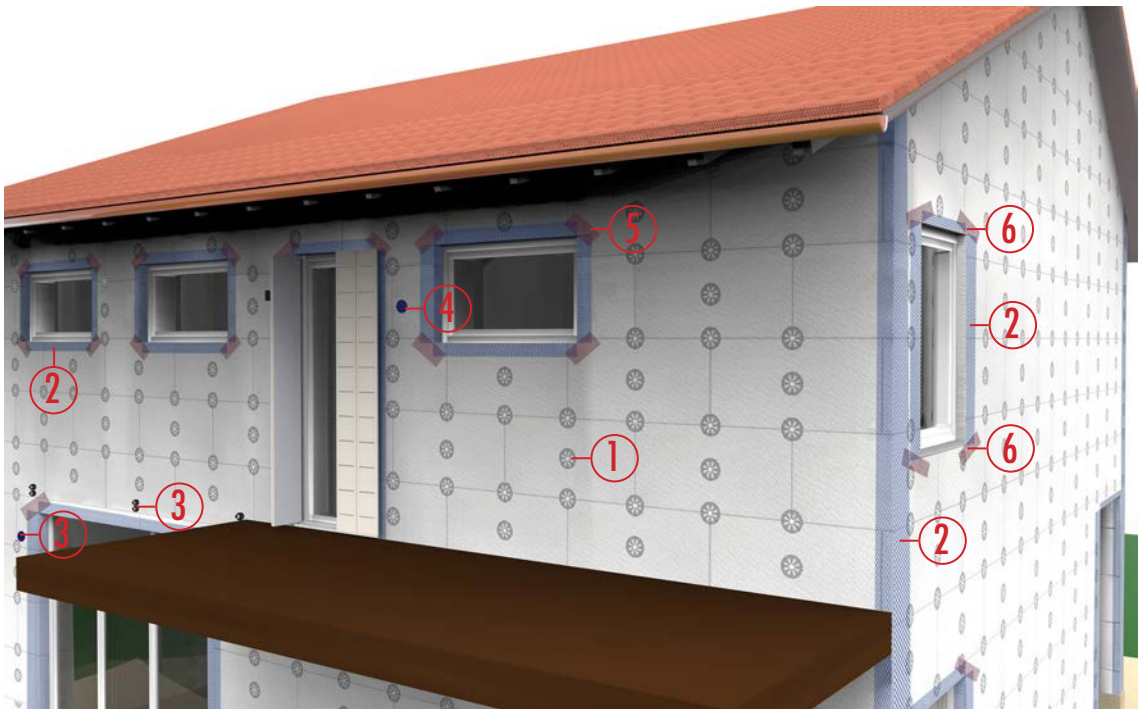
5
= CORNER MESH FOR SOFFITS


Preformed corner for soffits used as reinforcement for window soffits.

6
= ARROW NET REINFORCEMENT MESH


White preformed mesh.

VIEW 3.
COMPONENTS




1 = SGR GUSSET 


8 mm percussion gusset, with nail pre-mounted in the gusset shaft.

2 = PVC CORNER WITH MESH 


PVC corner protector with glass fibre mesh.

3 = DK FIX SQUARE 

Square support made of high density EPS with dimensions 98x98 mm.

4 = DK FIX CYLINDER EPS 

Cylindrical support made of high-density EPS, with diameter 90 and thicknesses 60, 80, 100, 120 and 140 mm.

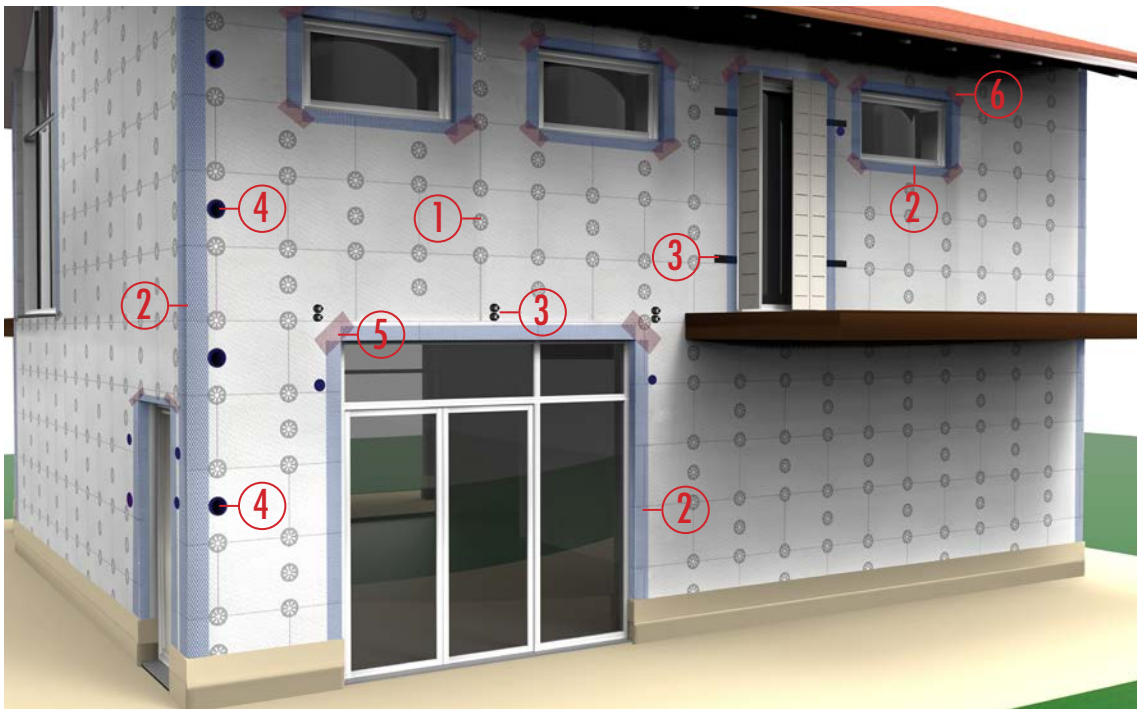
5 = CORNER MESH FOR SOFFITS 


Preformed corner for soffits used as reinforcement for window soffits.

6 = ARROW NET REINFORCEMENT MESH 

White preformed mesh.

VIEW 4.
COMPONENTS




1 = SGR GUSSET 

8 mm percussion gusset, with nail pre-mounted in the gusset shaft.

2 = PVC CORNER WITH MESH 


PVC corner protector with glass fibre mesh.

3 = DK FIX SQUARE 

Square support made of high density EPS with dimensions 98x98 mm.

4 = DK FIX CYLINDER EPS 

Cylindrical support made of high-density EPS, with diameter 90 and thicknesses 60, 80, 100, 120 and 140 mm.

5 = CORNER MESH FOR SOFFITS 

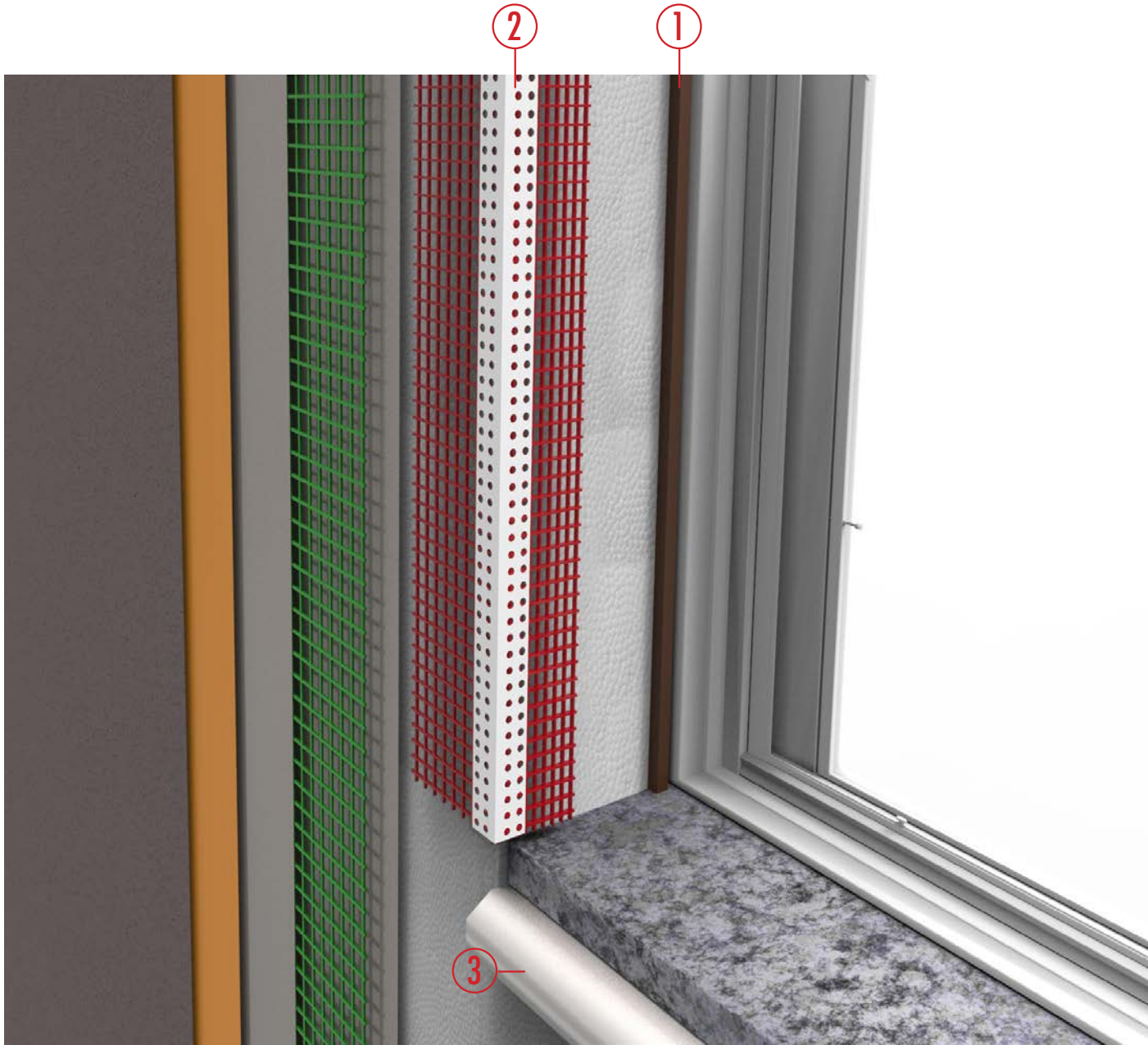
Preformed corner for soffits used as reinforcement for window soffits.

6 = ARROW NET REINFORCEMENT MESH 

White preformed mesh.

VIEW 1.

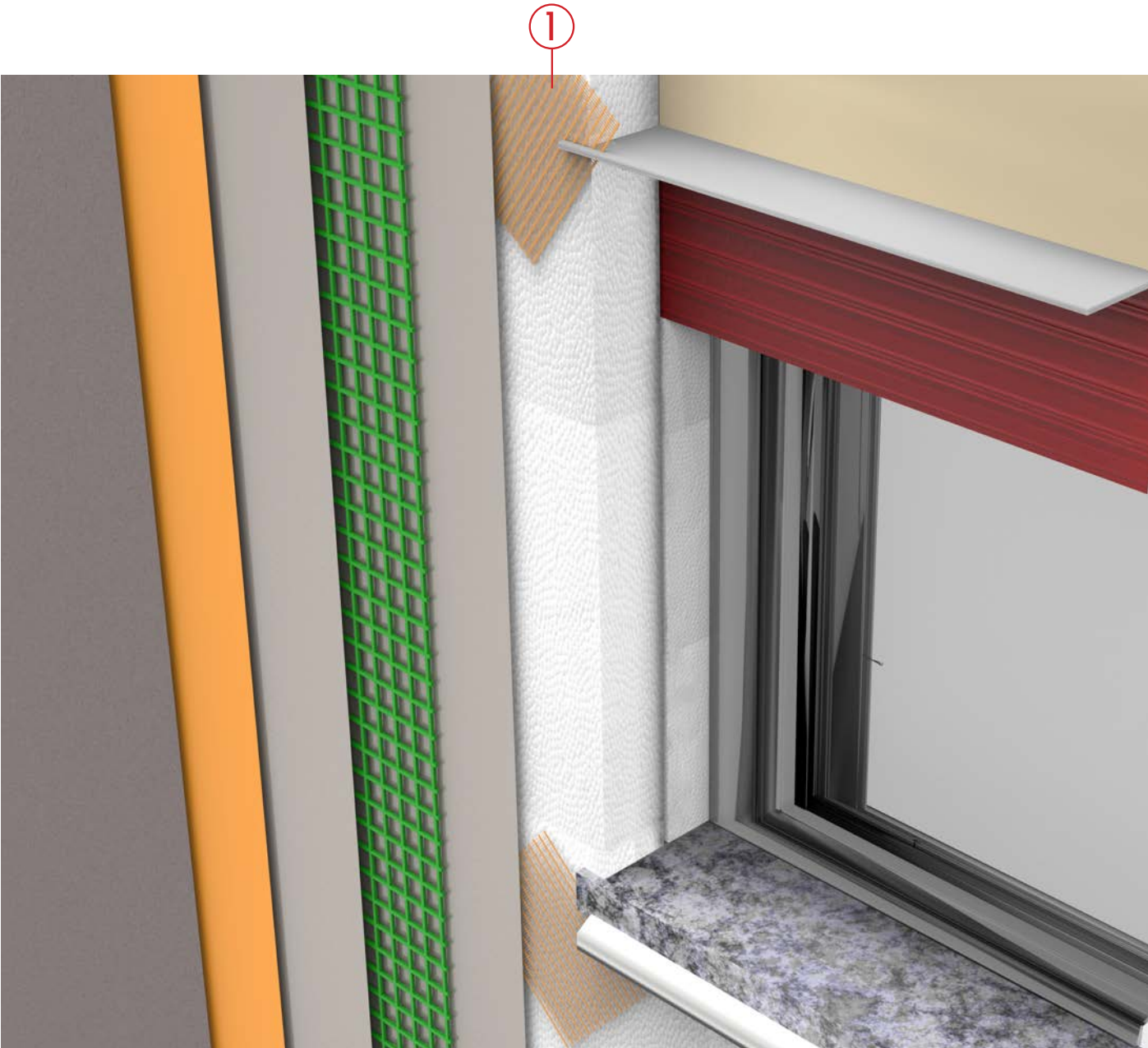
Detail of window hole on a new building



- 1
SELF-ADHESIVE COMPRESSIBLE SEALING TAPE
- 2
PVC CORNER WITH MESH
- 3
SILL PROFILE

VIEW 2.

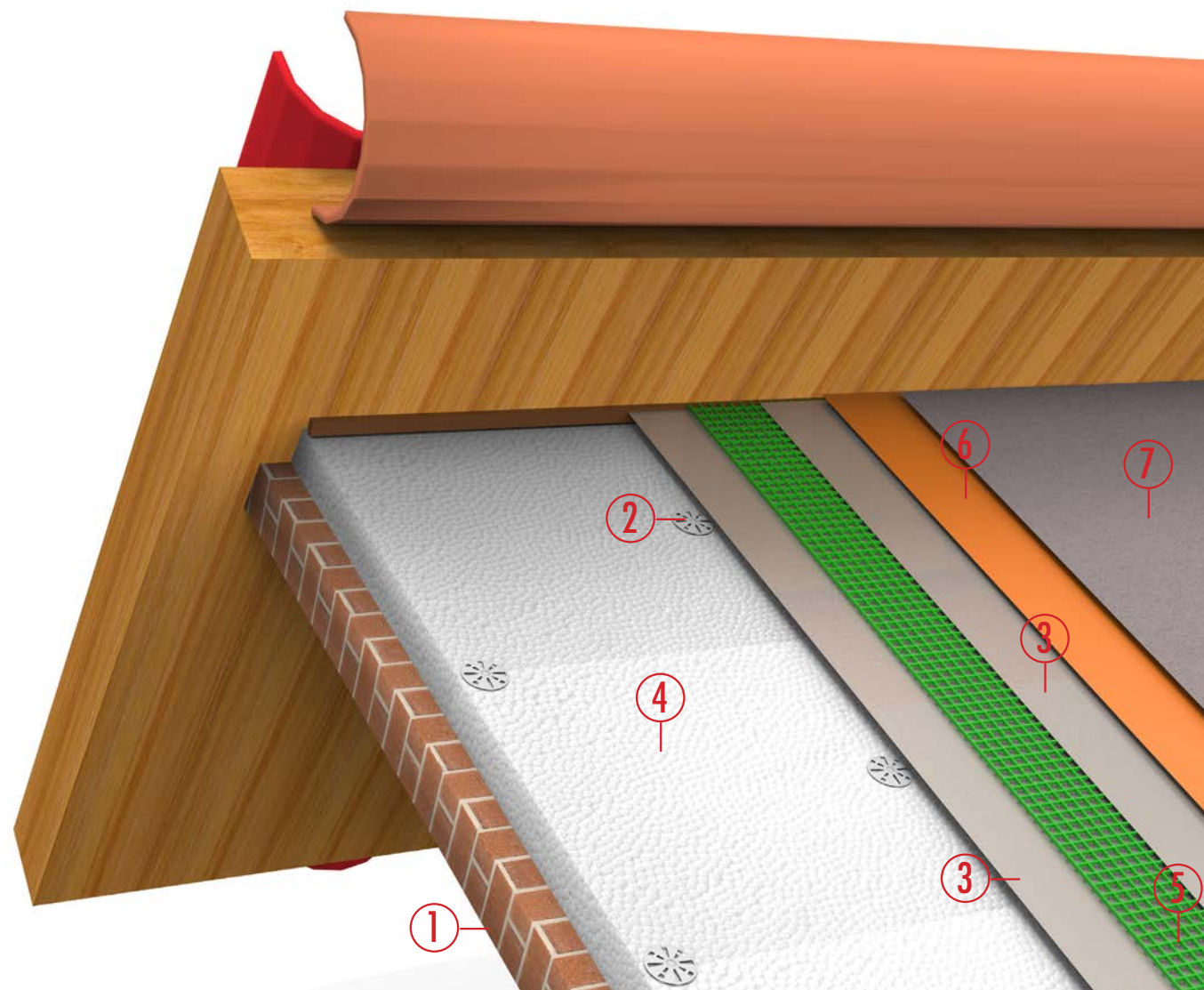
Window hole detail on a new building



- 1
CORNER MESH FOR SOFFITS

VIEW 3.

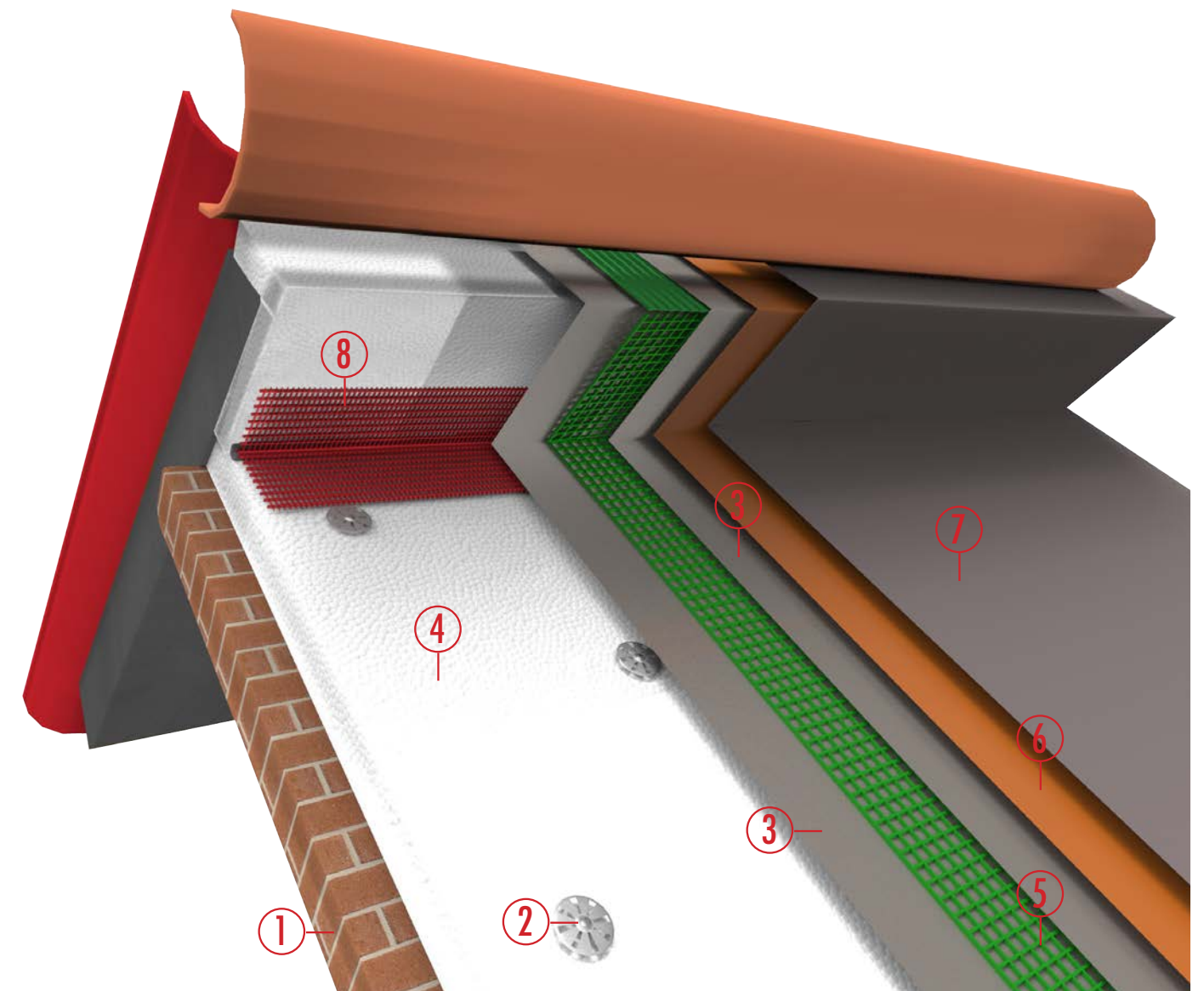
Connection with wooden roof



1 WALL SUPPORT	2 SGR GUSSET	3 FIBRE-REINFORCED ADHESIVE POWDER SKIM COAT	4 EPS PANEL
5 REINFORCEMENT WITH GLASS FIBRE MESH	6 WALL PRIMER	7 THICK COATING	

VIEW 4.

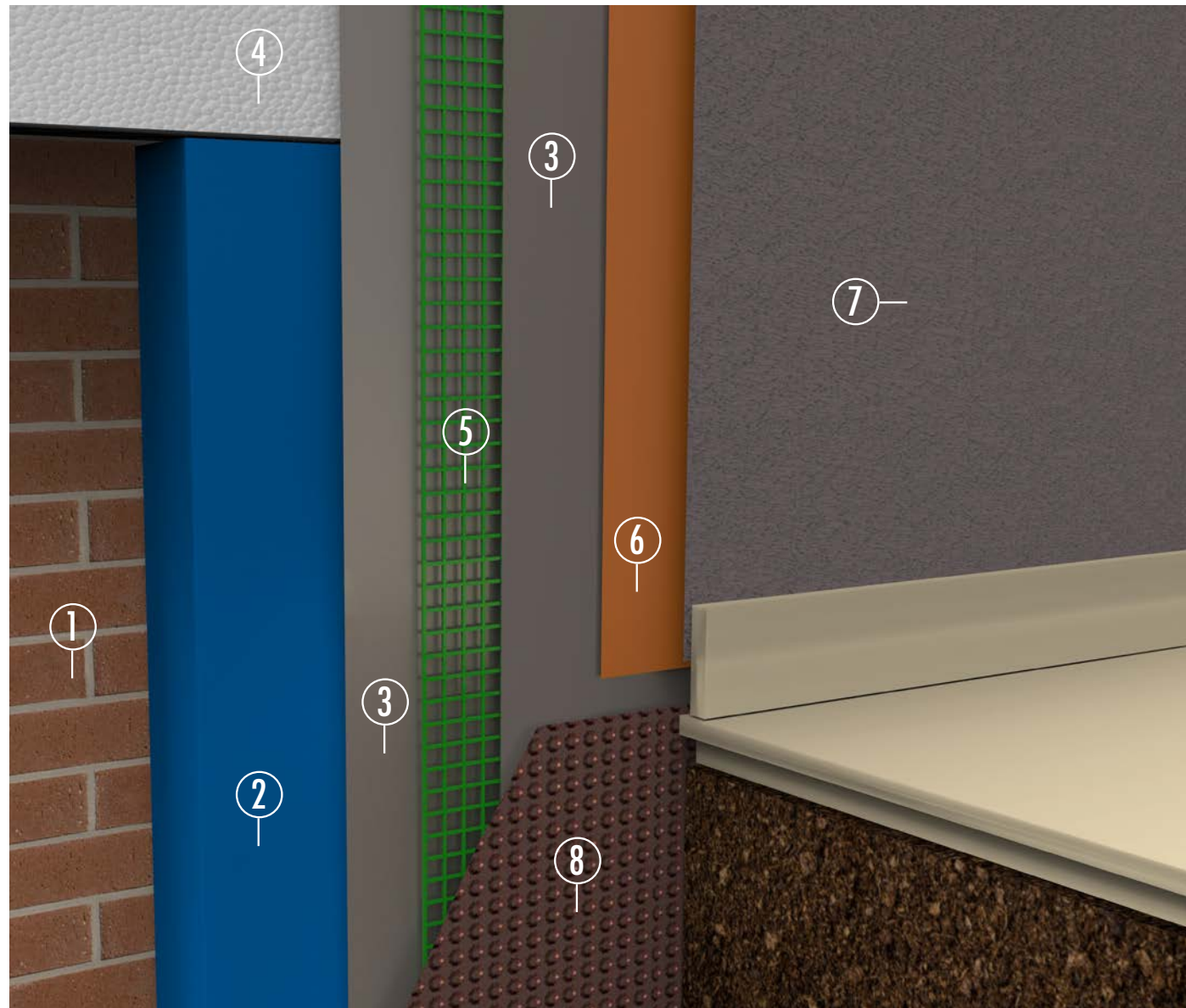
Connection with concrete roof



1 WALL SUPPORT	2 SGR GUSSET	3 FIBRE-REINFORCED ADHESIVE POWDER SKIM COAT	4 EPS PANEL
5 REINFORCEMENT WITH GLASS FIBRE MESH	6 WALL PRIMER	7 THICK COATING	8 PVC CORNER WITH MESH

VIEW 5.

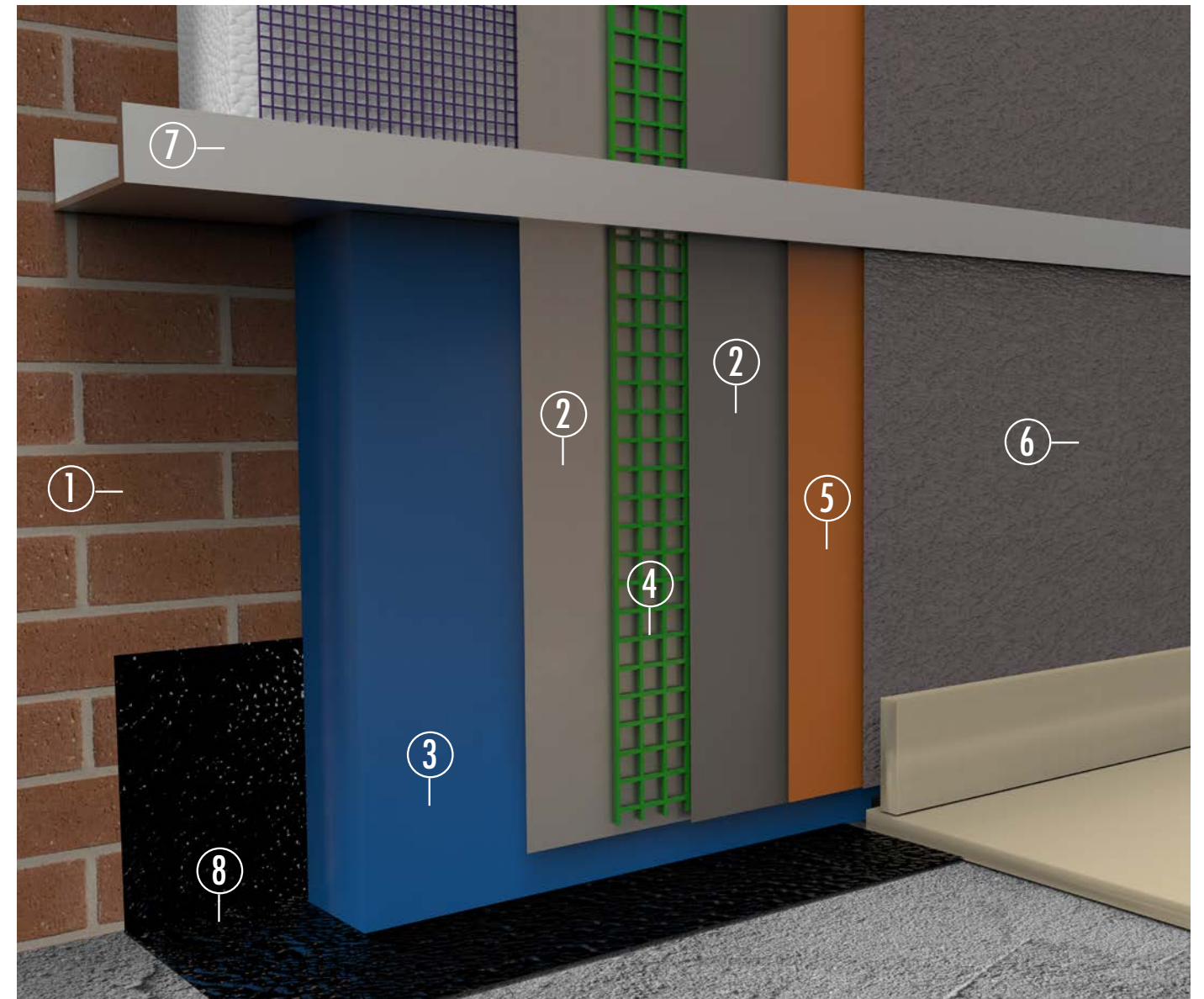
Starting skirting flush with the ground



1 WALL SUBSTRATE	2 SKIRTING BOARD	3 FIBRE-REINFORCED ADHESIVE POWDER SKIM COAT	4 EPS PANEL
5 REINFORCEMENT WITH GLASS FIBRE MESH	6 WALL PRIMER	7 THICK COATING	8 EMBOSSED POLYETHYLENE PROTECTION

VIEW 6.

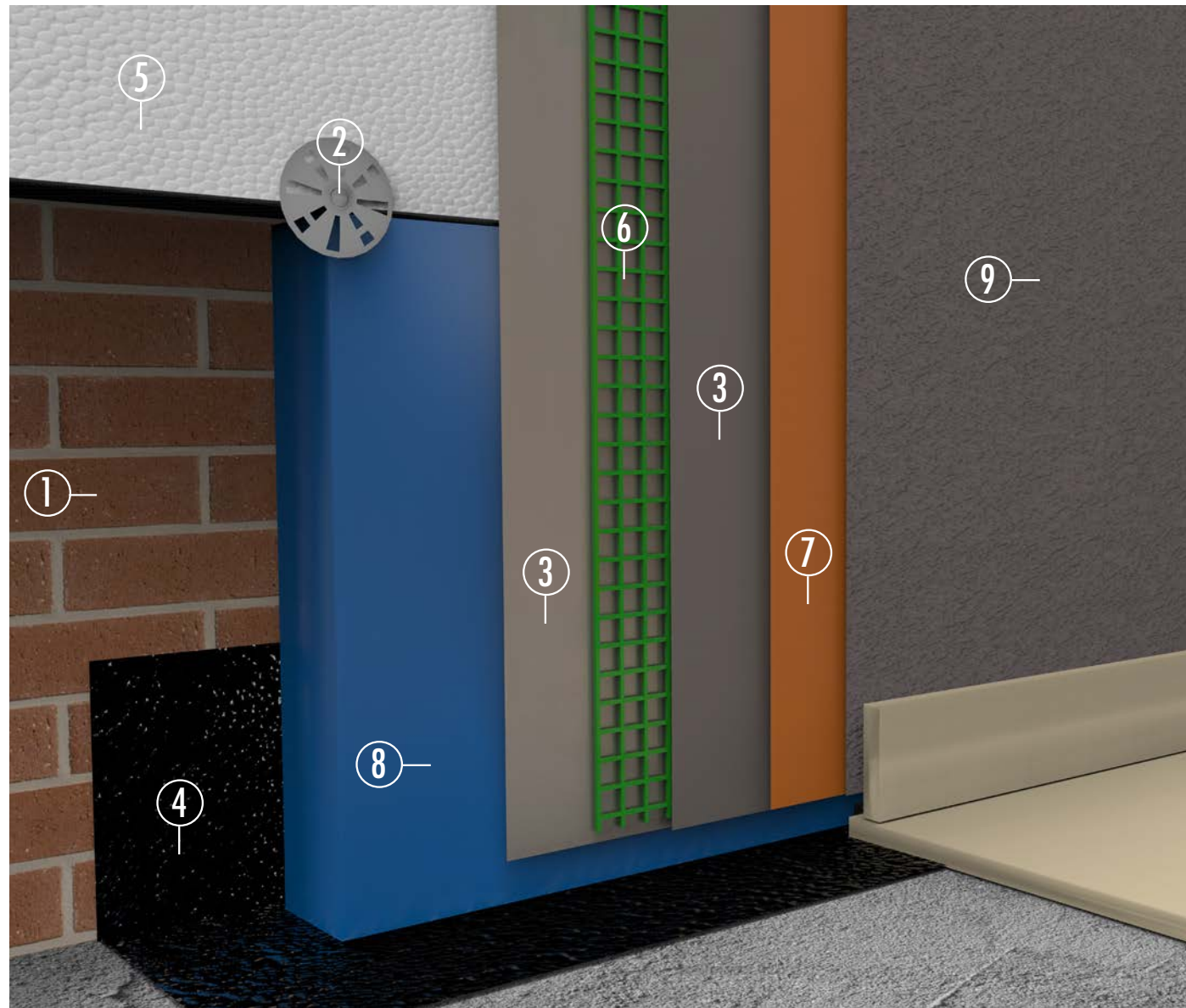
Flush starting skirting with base profile



1 WALL SUPPORT	2 FIBRE-REINFORCED ADHESIVE POWDER SKIM COAT	3 SKIRTING BOARD	4 REINFORCEMENT WITH MESH
5 WALL PRIMER	6 THICK COATING	7 STARTING BASE	8 WATERPROOF LAYER

VIEW 7.

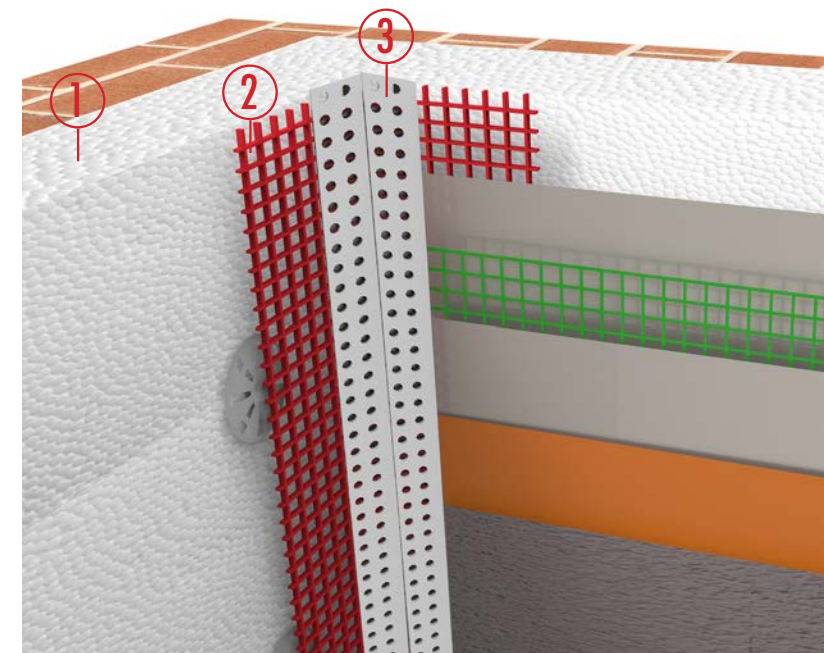
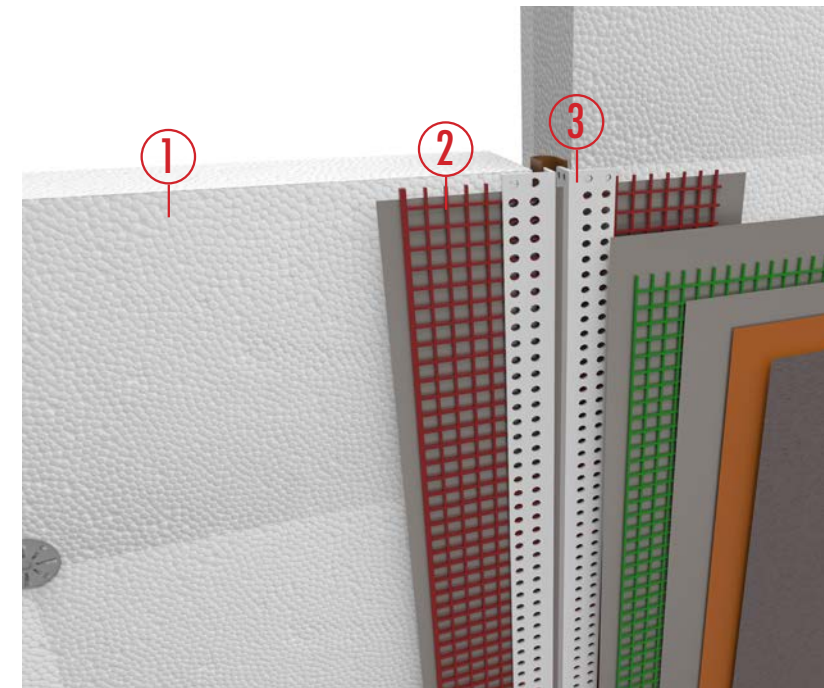
Flush starting skirting board



1 WALL SUBSTRATE	2 FIXING NAILS	3 FIBRE-REINFORCED ADHESIVE POWDER SKIM COAT
4 WATERPROOF LAYER	5 EPS PANEL	6 REINFORCEMENT WITH GLASS FIBRE MESH
7 WALL PRIMER	8 SKIRTING BOARD	9 THICK COATING

VIEW 8.

Linear and angular expansion joint



1 EPS PANEL	2 PVC CORNER WITH MESH	3 EXPANSION JOINT
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SEE ALSO THE OTHER CAP ARREGHINI BOOKS



PROTECTION OF PLASTER IN EXTERIOR ENVIRONMENTS



PROCESS OF CRACKING



TYPES OF PLASTER: PREPARATION AND RESTORATION WORKS



MOULD AND ALGAE



ASBESTOS ENCAPSULATION TECHNIQUE



PROTECTION AND REHABILITATION OF CONCRETE



TREATMENT OF DAMP WALLS



TREATMENT OF METALS



TREATMENT OF WOOD





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